GLOSSARY
OF
NETWORKING

(i341 Network)

BY

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10BaseT	A networking standard that utilizes UTP cabling with RJ-45 connectors, and transfers data at up to 10 Mbps. It has the advantage of utilizing economical and easy-to-install cabling.
10Base2	A networking standard that utilizes thin coaxial cabling with BNC connectors, and transfers data at up to 10 Mbps. It has the advantage of utilizing cabling with longer maximum lengths (610.5" as opposed to 330" with 10BaseT cabling).
10Base5	Original Ethernet using coaxial cable.
100BaseTX	A networking standard that transfers data at up to 100 Mbps, and utilizes UTP cabling with RJ-45 connectors.
100BaseFX	IEEE specification for fiber optic cable Ethernet LANs with a speed of 100 Mbps.
1000BaseCX	IEEE specification for gigabit Ethernet for short-haul copper twinax.
1000BaseLX	IEEE specification for gigabit Ethernet HDX/FDX fiber @ 850nm wavelength.
1000BaseSX	IEEE specification for gigabit Ethernet HDX/FDX fiber @ 1300nm wavelength.
10BASE5	Original Ethernet using coaxial cable.
10Base2	A networking standard that utilizes thin coaxial cabling with BNC connectors, and transfers data at up to 10 Mbps. It has the advantage of utilizing cabling with longer maximum lengths (610.5" as opposed to 330" with 10BaseT cabling).
802.x	Generic designation for IEEE subcommittees responsible for developing specifications for LANs and MANs.
802.3ae	defines a version of Ethernet with a nominal data rate of 10 Gbit/s, ten times faster than gigabit Ethernet. 10 gigabit Ethernet standard encompasses seven different media types for LAN, MAN & WAN.
802.3af	defines specification for PoE (Power over Ethernet) – supporting up to 13.5 watts power.
802.11x (a/b/d/g/n)	IEEE subcommittees responsible for WLAN (Wireless LAN) technologies.

802.11a

Operating in the 5 GHz band, 802.11a supports a maximum theoretical data rate of 54 Mbps, but more realistically it will achieve throughput somewhere between 20 Mbps to 25 Mbps in normal traffic conditions. In a typical office environment, its maximum range is 50 meters (150 feet) at the lowest speed, but at higher speed, the range is less than 25 meters (75 feet). 802.11a has four, eight, or more channels, depending on the country. WLAN products based on 802.11a technology are rapidly coming to market in 2003, making them more affordable and widely available.

802.11b
Most WLANs deployed today use 802.11b technology, which operates in the 2.4 GHz band and supports a maximum theoretical data rate of 11 Mbps, with average throughput falling in the 4 Mbps to 6 Mbps range. In a typical office environment, its maximum range is 75 meters (250 feet) at the lowest speed, but at higher speed its range is about 30 meters (100 feet). Bluetooth devices, 2.4 GHz cordless phones and even microwave ovens are sources of interference (and thus create poor performance) for 802.11b networks. Minimizing interference can be difficult because 802.11b uses only three non-overlapping channels. 802.11b products have been shipping in quantity for several years so you will find that products are plentiful and affordable.

802.11e
802.11e provides Quality of Service (QoS) support for LAN applications, which will be critical for delay-sensitive applications such as Voice over Wireless IP (VoWIP). The standard will provide classes of service with managed levels of QoS for data, voice, and video applications.

802.11g
The 802.11 task force is still developing 802.11g, and it is expected to be ratified as a standard by mid-2003. 802.11g offers the throughput of 802.11a with the backward compatibility of 802.11b. 802.11g will operate in the 2.4 GHz band but it will deliver data rates from 6 Mbps to 54 Mbps. Like 802.11b, it will have up to three non-overlapping channels. 802.11g uses orthogonal frequency-division multiplexing (OFDM) modulation as does 802.11a, but, for backward compatibility with 11b, it also supports complementary code keying (CCK) modulation and, as an option for faster link rates, allows packet binary convolutional coding (PBCC) modulation.

Its "backward compatibility" with 802.11b means that when a mobile 802.11b device joins an 802.11g access point, all connections on that access point slow down to 802.11b speeds.

802.11h
This standard is supplementary to the MAC layer to comply with European regulations for 5GHz WLANs. European radio regulations for the 5GHz band require products to have transmission power control (TPC) and dynamic frequency selection (DFS). TPC limits the transmitted power to the minimum needed to reach the furthest user. DFS selects the radio channel at the access point to minimize interference with other systems, particularly radar.

802.11i
This supplemental draft standard is intended to improve WLAN security. It describes the encrypted transmission of data between systems of 802.11a and 802.11b WLANs. It defines new encryption key protocols including the Temporal Key Integrity Protocol (TKIP) and the Advanced Encryption Standard (AES). AES will require new hardware when it is completed in 2003.
802.11k is a proposed standard for how a wireless local area network (WLAN) should perform channel selection, Roaming, and transmit power control (TPC) in order to optimize network performance. It is part of the 802.11 family of specifications.

802.11k is intended to improve the way traffic is distributed within a network. In a wireless LAN, each device normally connects to the access point (AP) that provides the strongest signal. Depending on the number and geographic locations of the subscribers, this arrangement can sometimes lead to excessive demand on one AP and underutilization of others, resulting in degradation of overall network performance. In a network conforming to 802.11k, if the AP having the strongest signal is loaded to its full capacity, a wireless device is connected to one of the underutilized APs. Even though the signal may be weaker, the overall throughput is greater because more efficient use is made of the network resources.

There is disagreement as to how soon the new specification will be formally adopted, and how soon after that devices using it will become available. Some sources predict deployment as early as 2005; others suggest that the process will take several years.

802.11n specifies high speed wireless LAN with backward compatibility to 802.11a/g (depending on if running at in 2.4GHz or 5 GHz). 802.11n is a proposed amendment which improves upon the previous 802.11 standards by adding multiple-input multiple-output (MIMO) and many other newer features (i.e. error detection & correction)

802.15

This IEEE working group addresses the standard for WPANs. It has four active task groups.

802.15.1 had the job of delivering the standard for low-speed, low-cost WPANs and is based on the Bluetooth spec.

802.15.2 task group is developing the recommended practices on how 802.11 WLANs and 802.15 WPANs can co-exist in the 2.4 GHz band. It is mainly working on the interference problem between Bluetooth and 802.11.

802.15.3 task group is delivering a standard for higher speed WPANs from 10 Mbps to 55 Mbps at distances less than 10 meters.

802.15.4 task group is preparing a standard for simple, low-cost, low-speed WPANs. Data ranges from 2 Kbps to 200 Kbps and uses DSSS modulation in the 2.4 GHz and 915 MHz ranges. ZIGBEE

A

AAL	ATM Adaptation Layer (see ATM AL).
Abstract Syntax	A description of a data structure that is independent of machine-oriented structures and encodings
Available Bit Rate	One of five ATM Forum-defined service categories. In this service type, the network makes the best effort to pass the maximum number of cells but does not guarantee cell delivery. Supports variable bit rate data traffic with flow control, a minimum guaranteed data transmission rate and specified performance parameters. In exchange for regulating user traffic flow, the network offers minimal cell loss of accepted traffic. Traffic parameters are PCR and MCR. QoS parameters are CLR and CER.
Accounting Management	That area of network management that provides usage data for billing at a network access level
Access Line	A communications line (e.g. circuit) interconnecting a frame-relay-compatible device(DTE) to a frame-relay switch (DCE). See also Trunk Line
Access Point (AP)	In 802.11, a station that is also physically connected to the distribution system and provides distribution services to other stations with which it is associated.
Access Rate (AR)	The data rate of the user access channel. The speed of the access channel determines how rapidly (maximum rate) the end user can inject data into a frame relay network.
AccuMaster	Network management product for AT & T
ACK (Acknowledgment)	A communication control character transmitted by a receiver as an affirmative response to a sender. It indicates that the

	preceding transmission block has been received, and that the receiving unit is ready to accept the next block of the transmission.
Acoustic Coupler	A device that allows a telephone handset to be used for access to the switched telephone network for data transmission (generally limited to 1200 bps)
ACSE	Association Control Service Element - The method used in OSI for establishing a call between two applications. Checks the identities and contexts of the application entities, and could apply an authentication security check.
Ad Hoc Network	An ad hoc network is a network composed solely of stations within mutual communication range of each other via the wireless medium. An ad hoc network is typically created in a spontaneous manner. The principal characteristic of an ad hoc network is its limited temporal and spatial extent. These limitations allow the act of creating and dissolving the ad hoc network to be sufficiently straightforward and convenient so as to be achievable by non-technical users of the network facilities (i.e. no specialized 'technical skills' are required with little and/or no investment of time or additional resources required beyond the stations which are to participate in the (ad hoc) network). The term "Ad Hoc" is often used as slang to refer to an Independent BSS (IBSS).
Adaptive Equalization	Equalization which is adjusted while signals are being transmitted in order to adapt to changing line characteristics.
ADPCM	(Adaptive Differential Pulse Code Modulation) - An ITU standard technique for encoding analog voice signals into a digital form at 32 kbps (half the standard PCM rate).
Adaptive Routing	Routing that automatically adjusts to network changes such as altered traffic patterns or failures.
Address	An identifying number that specifies the location of a computer resource such as a node, a process, or a memory allocation
Address Mask	A bit mask used to select bits from an Internet address for subnet addressing. The mask is 32 bits long and selects the network portion of the Internet address and one or more bits of the local portion. Sometimes called subnet mask.
Address Resolution	A means for mapping Network Layer addresses onto media-specific addresses. See ARP.
Address Resolution (ARP)	A Transmission Control Protocol/Internet Protocol (TCP/IP) Protocol process that maps IP addresses to Ethernet addresses; required by TCP/IP for use with Ethernet.
ADMD	Administration Management Domain - An X.400 Message Handling System public service carrier. Examples: MCImail and ATTmail in the U.S. , British Telecom Gold400mail in the U.K. The ADMDs in all countries worldwide together provide the X.400 backbone. See PRMD.

Advanced Peer-to-Peer Networking (APPN)	The network architecture within the IBM Systems Application Architecture that provides for peer-to-peer access among computers. Under APPN, a mainframe host is not required. It also implements concepts such as dynamic network directories and dynamic routing in a Systems Network Architecture network.
Advanced Program-to-Program Communications (APPC)	An IBM-specified network node definition featuring high level program interaction capabilities on a peer-to-peer basis (also known as Logical Unit 6.2)
Advanced Encryption Stnd	AES addresses security isues/concerns for WLANs. AES is US Government's next-gen cryptography algorithm which will potentially replace DES and 3DES.
Agent	In the client-server model, the part of the system that performs information preparation and exchange on behalf of a client or server application. In SNMP, the word agent refers to the managed system
Aggregate	The combined output signal from a device that accepts multiple input signals and multiplexes them together in some fashion (i.e., TDM)
Alternate Routing	Routing a call or message over a substitute route when a primary route is unavailable for immediate use.
AMI	Alternate Mark Inversion - A bipolar coding scheme in which successive ones (marks) must alternate in polarity.
American National Standards Institute	(ANSI) The standards organization responsible for the ASCII code set (American Standard Code for Information Interchange)
American Standard Code for Information Exchange	(ASCII) Data communications code set introduced to simplify communication between computer systems sold by different vendors
Amplitude	The size of magnitude of a voltage or current wave form
Amplitude Modulation	Changing the voltage level or amplitude of a carrier frequency to transmit digital or analog information
Analog	In data communications, the description of the continuous wave or signal (such as the human voice) for which conventional telephone lines are designed. For transmission on these lines, the digital or pulse output of a computer or terminal must be converted to an analog signal.
Analog signal	A continuously varying electromagnetic wave
Analog Transmission	Transmission of a continuously variable signal as compared to a discrete (digital) one.
ANSI	American National Standards Institute - The U.S. standardization body. ANSI is a member of the International Organization for Standardization (ISO).

AOW	Asia and Oceania Workshop - One of the three regional OSI Implementors Workshops, equivalent to OIW and EWOS
API	Application Program Interface - A set of conventions defining how a service is invoked through a software package.
AppleTalk	The name of Apple Computer's networking specification. AppleTalk includes specifications for the physical layer as LocalTalk, EtherTalk, and TokenTalk; network and transport functions as Datagram Delivery Protocol and AppleTalk Session Protocol; addressing as Name Binding Protocol; file sharing as AppleShare; and remote access as AppleTalk Remote Access.
Application Layer	The top-most layer in the OSI Reference Model providing such communication services as electronic mail and file transfer.
Application Program Interface (API)	A set of formalized software calls and routines that can be referenced by an application program to access underlying network services.
Architecture	Architecture typically describes how the system or program is constructed, how its components fit together, and the protocols and interfaces used for communication and cooperation among modules or components of the system. Network architecture defines the functions and description of data formats and procedures used for communication between nodes of workstations. A logical structure for network communications. constructed of protocols, formats, operation sequence and interfaces
Arcnet	Datapoint designed this 2.5Mbps token-passing, star-wired network in the 1970s. Its low cost and high reliability make it attractive to those companies on a tight network budget, although it is not endorsed by any IEEE committee. ArcnetPlus is Datapoint's proprietary product that runs at 20Mbps.
ARIS	Aggregate Rout-based IP Switching. ARIS is IBM’s label switching proposal and is similar architecturally to Tag switching.
ARPA	Advanced Research Projects Agency - Now called DARPA, the U.S. government agency that funded the ARPANET.
ARPANET	A packet switched network developed in the early 1970s. The "grandfather" of today's Internet. ARPANET was decommissioned in June 1990.
ASCII	See American Standard Code for Information Interchange
Associate (WLAN term)	In 802.11, a service and protocol exchange that establishes a mapping between an access point and a mobile station and enables the mobile station to use the Distribution System Services.
Asymmetric Digital Subscriber Line	ADSL - digital switched technology that provides very high data transmission speeds over telephone system wires. The speed of the transmission is asynchronous, meaning that the transmission speeds for uploading and downloading data are different. For example, upstream

	transmissions may vary from 16 Kbps to 640 Kbps and downstream rates may vary from 1.5 Mbps to 9 Mbps. Within a given implementation the upstream and downstream speeds remain constant.
ASN.1	Abstract Syntax Notation One - The OSI language for describing abstract syntax. See BER
Asynchronous	When used to define a code set, character codes that contain start and stop bits. When used to define data transmission, a signal that does not need a separate clock synchronization signal for data reception. Asynchronous transmission is also called start-stop transmission, because one character is sent at a time.
Asynchronous Transfer (ATM)	Method of data transmission used by Broadband ISDN. ATM Mode transmission is defined as 53-octet, fixed-length packets over a cell-switched network. Speeds up to 2.2 gigabits per second are possible and it is capable of carrying voice, video, and data. ATM has been embraced by the LAN and WAN industries, which have proclaimed it the solution to integrating disparate networks across a large geographic distance. It is also called cell relay.
ATM Adaptation Layer (AAL)	AAL is the set of four standard protocols that translate user traffic from the higher layers of the protocol stack into a size and format that can be contained in the payload of an ATM cell and return it to its original form at the destination. Each AAL consists of two sublayers: the segmentation and reassembly (SAR) sublayer and the convergence sublayer. Each is geared to a particular class of traffic, with specific characteristics concerning delay and cell loss. All AAL functions occur at the ATM end-station rather than at the switch. AAL 1 addresses CBR (constant bit rate) traffic such as digital voice and video and is used for applications that are sensitive to both cell loss and delay and to emulate conventional leased lines. It requires an additional byte of header information for sequence numbering, leaving 47 bytes for payload. AAL 2 is used with time-sensitive, VBR (variable bit rate) traffic such as packetized voice. It allows ATM cells to be transmitted before the payload is full to accommodate an application's timing requirements. The AAL 2 spec has not been completed by the ATM Forum. AAL 3/4 handle bursty connection-oriented traffic, like error messages, or variable-rate connectionless traffic, such as LAN file transfers. It is intended for traffic that can tolerate delay but not cell loss; to ensure that the latter is kept to a minimum, AAL 3/4 performs error detection on each cell and uses a sophisticated error-checking mechanism that consumes 4 bytes of each 48-byte payload. AAL 3/4 allows ATM cells to be multiplexed. AAL 5 accommodates bursty LAN data traffic with less overhead than AAL 3/4. Also known as the simple and efficient adaptation layer (SEAL), AAL 5 uses a conventional 5-byte header. It does not support cell multiplexing.

ATM Address	ATM addresses, at 20 bytes long, scale to very large networks. ATM Addressing is hierarchical, as in a phone network, using prefixes similar to area codes and exchanges. ATM switches share address information with attached end-stations and maintain end-station addresses in routing tables. ATM source and destination addresses are not included within each cell but are used by ATM switches to establish virtual path and virtual channel identifiers (VPIs/VCIs).
ATM CSU/DSU	An ATM CSU/DSU segments ATM-compatible information, such as DXI (data exchange interface) frames generated by a router, into ATM cells and then reassembles them at their destination.
ATM Forum	The ATM Forum is the primary organization developing and defining ATM standards. Principal members participate in committees and vote on ATM specifications. Auditing members cannot participate in committees but receive technical and marketing documentation; user members participate only in end-user roundtables. Formed in 1991 by Adaptive Corp. (Redwood City, Calif.), Cisco Systems Inc. (San Jose, Calif.), Northern Telecom Ltd. (Mississauga, Ontario), and Sprint Corp. (Kansas City, Mo.), the forum currently consists of 606 manufacturers, carriers, end-users, and other interested parties.
ATM Network Integrated Processing (NIP)	A computing architecture intended for eliminating the distinction between processor and network. NIP uses ATM (or other high-speed LAN or WAN technology) to build a distributed computing environment. Within that environment, components of a single computation would be able to share data across thousands of miles and among hundreds of processor nodes. NIP applications could draw upon a geographically dispersed pool of CPU resources in order to aggregate the processing cycles needed for large-scale computing tasks. At present, ATM probably offers the most viable NIP infrastructure because it permits the use of a single technology over local and wide areas. In addition, NIP's quality of service features enable rapid and reliable allocation of bandwidth.
AT&T divestiture	In 1984, AT&T was broken up into independent RBOCs and a separate AT&T company. The divestiture ended the regulated monopoly of AT&T as well as freeing AT&T and the RBOCs to enter into business areas previously denied to them.
Attachment Unit Interface (AUI)	A 15-pin socket used in Ethernet devices. AUI connections adapt between two cabling types and work with a wide variety of wiring schemes.
Attenuation	Loss of signal energy characterized by signal weakening, measured in decibels.
Attribute	The form of information items provided by the X.500 Directory Service. The directory information base consists of entries, each containing one or more attributes. Each attribute consists of a type identifies together with one or more values. Each directory Read operation can retrieve some or all attributes form a designated entry.

Audit Trail	A chronological record of system activities that is sufficient to enable the reconstruction, reviewing, and examination of the sequence of environments and activities surrounding or leading to an operation, a procedure, or an event in a transaction from its inception to final results. This is a critical aspect of documenting hacking/intrusion activities.
Authentication	A mechanism which allows the receiver of an electronic transmission to verify the sender and the integrity of the transmission content through the use of an electronic key or algorithm which is shared by the trading partners. This is sometimes referred to as an electronic signature. In 802.11, the service and protocol exchange used to establish the identity of one station as a member of the set of stations authorized to associate with another station.
Automatic Request for Repeat or Retransmission (ARQ)	A communications feature where the receiver asks the transmitter to resend a block or frame because errors were detected by the receiver.
Autonomous System	Internet (TCP/IP) terminology for a collection of gateways ("routers") that fall under one administrative entity and cooperate using a common routing protocol.
AWG	The American Wire Gauge System, which specifies wire width.

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B

Backbone	The primary connectivity mechanism of a hierarchical distributed system. All systems which have connectivity to an intermediate system on the backbone are assured of connectivity to each other. This does not prevent systems from setting up private arrangements with each other to bypass the backbone for reasons of cost, performance, or security.
Backward Explicit Congestion Notification (BECN)	A bit set by a frame relay network to notify an interface device(DTE) that congestion avoidance procedures should be initiated by the sending device.
Baluns	Adapters that change coaxial cable connectors into twisted-pair wire connectors, allowing transfer from one medium to another or from a connector for one medium to a different medium.
Bandwidth	The size of a transmission channel (width). The difference expressed in hertz (frequency) between the highest and lowest frequencies of a band. In modern usage, bandwidth defines the maximum specified throughput of a communication channel.
Bart Simpson	Internet and OSI hero.
Baseband	Characteristic of any network technology that uses a single carrier frequency and requires all stations attached to the network to participate in every transmission.

Basic Rate Interface (BRI)	A ISDN offering (two 64 Kbps "B" channels for information transfer and one 16 Kbps "D" channel for control and signaling).
Batch Processing	A method of grouping a number of similar applications for input and processing in sequential order (generally regarded as nonreal-time transmission of large files).
Baud	The number of signal level changes per second. Each signal level contains one (or more) bit of information
Baudot Code	A five bit code set used in telegraphy. The 32 character limit of the five level code is expanded to 53 characters by use of shift characters (like upper and lower case mode).
BECN	Backward Explicit Congestion Notification – bit in frame relay protocol header, set by congested network node in any frame which is traveling in reverse direction of the congestion.
Bell Communications Research (Bellcore)	The organization established at AT&T divestiture, representing and funded by the BOC's and RBOCs, for the purpose of establishing telephone network standards and interfaces (includes much of what had been Bell Laboratories).
Bell Operating Company (BOC)	Any of the 22 local telephone companies divested from AT&T and reorganized into the seven Regional Bell Holding Companies (RBHCs).
Bell standards	Refers to the U. S. modulation protocol standards developed by the former AT&T Bell Systems such as Bell 103 (300bps transmission) and Bell 212A (1200bps transmission).
BER	Basic Encoding Rules - Standard rules for encoding data units described in ASN.1. Sometimes incorrectly lumped under the term ASN.1, which properly refers only to the abstract syntax description language, not the encoding technique.
BGP	Border Gateway Protocol. An IP protocol used to exchange routing information between network domains.
Big-Endian	A format for storage or transmission of binary data in which the most significant bit (or byte) comes first. The reverse convention is called little-endian.
Binary	A method of representing information. It relies on two states: on "on", or "mark" state and an "off" or "space" state
Binary Synchronous	(BSC) Developed by IBM in the 1960's, Binary Synchronous Communication is a data link control procedure for use with synchronous transmission
Bipolar	The predominant signaling method used for digital transmission services, such as DDS and T1, in which binary "1"s are represented by alternating positive and negative

	pulses while binary "0"s remain at a zero amplitude no pulse level.
Bipolar *-Zero Substation	A technique used to satisfy the ones density (B8ZS) requirements of digital T-carrier facilities in the public network while allowing 64 Kbps clear channel data. Strings of eight consecutive zeros are replaced by an eight-bit code representing two intentional bipolar pulse violations (000V10V1).
BISDN	Broadband ISDN
Bit and Bits/ses	Binary digit. The smallest unit of information. All digital information is composed of bits. Bits Per Second: the measure of the number of bits of information that are transmitted per second. Usually written as bps
Bit Error Rate (BER)	The ratio of received bits that are in error, usually expressed as a number referenced to a power of 10 (1 error in 10 (to the 5th power) bits or a BER of 10 to the negative 5)
Bit Error Rate Test/ Tester (BERT)	A device used to test the bit error rate of a communications circuit.
BITNET	Because It's Time NETwork - An academic computer network based originally on IBM mainframe systems interconnected via leased 9600 bps lines. BITNET has recently merged with CSNET, the Computer+ Science Network (another academic computer network) to form CREN: The Corporation for Research and Educational Networking. See CSNET.
BNC connector	A connector utilized in 10Base2 networks with thin coaxial cabling.
BOC	Bell Operating Company - More commonly referred to as RBOC for Regional Bell Operating Company. The local telephone company in each of the seven U.S. regions.
Breakout box	A passive, multipurpose diagnostic device that is patched or temporarily inserted into a circuit at an interface for electronic physical layer – signaling visibility.
Bridge	A device that connects two or more physical networks and forwards packets between them. Bridges can usually be made to filter packets, that is, to forward only certain traffic. Related devices are: repeaters which simply forward electrical signals from one cable to another, and full-fledged routers which make routing decisions based on several criteria. In OSI terminology, a bridge is a Data Link Layer intermediate system. See repeater and router.
Broadband	Characteristic of any network that multiplexes multiple, independent network carriers onto a single cable. This is usually done using frequency division multiplexing. Broadband technology allows several networks to coexist on one single cable; traffic from one network does not interfere with traffic from another since the "conversations" happen on different frequencies in the "ether," rather like the commercial radio system.

Broadband Integrated Services Digital Network (B-ISDN)	A class of emerging high-speed data and voice services for the wide area network. Switched Multimegabit Data Services and Asynchronous Transfer Mode are two emerging B-ISDN services that will provide megabits and gigabits of bandwidth across a wide area network.
Broadcast (Address)	A packet delivery system where a copy of a given packet is given to all hosts attached to the network. Example: Ethernet.
Broadcast storm	Network congestion that occurs when large numbers of frames are transmitted by many stations in response to a transmission by one station.
Brouter	A device that can transparently bridge protocols as well as route them. It is a hybrid of a bridge and a router.
Browser	A program that allows a user to navigate the Internet using hypertext links. A browser supports one or more Internet protocols, such as HTML.
BSD	Berkeley Software Distribution - Term used when describing different versions of the Berkeley UNIX software, as in "4.3BSD UNIX".
Basic Service Set (BSS)	In 802.11, a set of stations controlled by a single Coordination Function.
BSS Basic Rate Set	The set of data transfer rates (data rates) which all the stations in a BSS will be capable of using to receive frames.
Buffer	A storage device or routine used to compensate for a difference in the rate of data flow, or the time of occurrence of events, when transmitting data from one device to another. A buffer permits a change of speed, voltage, or interface characteristic between two devices.
Buffer overflow/overrun	A situation that arises when the buffer is either too small or too full to receive the transmitted data. In either case there is no place to store the arriving characters, and the data is lost.
Burst Rate (mode)	Burst mode (in the context of frame relay) is the peak load anticipated for a PVC. CIR is the guaranteed level of bandwidth, burst mode is the ability to provide additional capacity upon demand.
Bus	A transmission path or channel. A bus is typically an electrical connection with one or more conductors, where all attached devices receive all transmissions at the same time.
Byte	A group of bits (normally 8 bits in length).

C

cable modem	A modem that provides an interface between a user's system and a cable TV provider. Cable modems allow users to access resources such as the Internet via a high-speed cable TV connection.
Campus Area Network (CAN)	A backbone network connecting local area networks within a campus. A CAN connects LANs from multiple departments in a single building or campus. Campus networks are local area networks; that is, they don't include wide area network services, but they may span several miles
Carrier	1. A continuous frequency capable of being modulated with a second (information carrying) signal. 2. A communications company or authority providing circuits to carry private traffic (also known as common carrier).
Carrier signal	A wave that continues without change. The carrier signal can be modulated by a modem so a receiver can interpret the information.
Category 1	The Electronics Industry Association/Telecommunications Industry Association (EIA/TIA) 586 standard specifies commercial building telecommunications wiring. Category 1 wiring is old-style unshielded twisted-pair (UTP) telephone cable, and it is not suitable for data transmission.
Category 2	The EIA/TIA 586 standard certifies Category 2 UTP for use up to 4 Mbps. Category 2 is similar to the IBM Cabling System Type 3 cable.
Category 3	The EIA/TIA 586 Standard specifies Category 3 UTP for speeds up to 10 Mbps, and it is the minimum cable required for 10BaseT.
Category 4	The EIA/TIA 586 standard specifies Category 4 as the lowest grade UTP acceptable for 16 Mbps Taken Ring.
Category 5	The EIA/TIA 586 standard specifies Category 5 is certified for speeds up to 1000Mbps.
CCITT	International Consultative Committee for Telegraphy and Telephony - A unit of the International Telecommunications Union (ITU) of the United Nations. As organization with representatives from the PTTs of the world. CCITT produces technical standards, known as "Recommendations", for all internationally controlled aspects of analog and digital communications. See X Recommendations.
CCR	Commitment, Concurrency, and Recovery - An OSI application service element used to create atomic operations across distributed systems. Used primarily to implement two-phase commit for transactions and nonstop operations.

Cell	A fixed-length packet. Asynchronous Transfer Mode (ATM) uses 53-octet cells, 5 constitute the header; the remaining 48 carry the data payload.
Cell Delay Variation (CDV)	Measures the allowable variance in delay between one cell and the next, expressed in fractions of a second. When emulating a circuit, CDV measurements allow the network to determine if cells are arriving too fast or too slow.
Cell Interarrival Variation (CIV)	More commonly referred to as "jitter", CIV measures how consistently ATM cells arrive at the receiving end-station. Cell interarrival time is specified by the source application and should vary as little as possible. For constant bit rate (CBR) traffic, the interval between cells should be the same at the destination and the source. If it remains constant, the latency of the ATM switch or the network itself (also known as cell delay) will not affect the cell interarrival interval. But if latency varies, so will the interarrival interval. Any variation could affect the quality of voice or video applications.
Cell Multiplexing/Demultiplexing	ATM layer function that groups cells belonging to different virtual paths or circuits and transmits them in a stream to the target switch, where they are demuxed and routed to the correct end-points.
Cell-Loss Priority (CLP) Field	A priority bit in the ATM cell header; when set, it indicates that the cell can be discarded if necessary.
Cells in Frames (CIF)	CIF defines the method to encapsulate ATM cells in Ethernet and token ring frames, allowing ATM data to be transported to legacy desktops. The advantage of CIF is that it enables developers to create ATM applications that run over hybrid legacy networks.
Cell Relay	A form of packet transmission used by Broadband ISDN network. Also called ATM, cell relay transmits 53-octet fixed-length packets over a packet-switched network. ATM makes it possible to use a single transmission scheme for voice, data and video traffic on LANs and WANs.
Central Office (CO)	A center (normally a Class 5 office) where communications carriers terminate customer lines (subscriber local loops) and where switching equipment interconnects those lines.
Centrex	A PBX-like service provided by a local telephone company in which incoming calls can be dialed direct to any station without an operator's assistance (DID). The Centrex switch is not located on-site.
Channel	Generically refers to the user access channel across which frame relay data travels. Within a given T1 or E1 physical line, a channel can be one of the following, depending of how the line is configured. Unchannelized: the entire T1/E1 line is considered a channel. The T1 line operates at speeds of 1.536 Mbps and is a single channel consisting of 24 T1 time slots. An E1 line operates at speeds of 1.984 Mbps and is a single channel consisting of 20 E1 time slots.

	Channelized : The channel is any one of N time slots within a given line. The T1 line consists of any one or more channels. Each channel is any one of 24 time slots. A T1 link operates at speeds in multiples of 56/64 Kbps to 1.536 Mbps, with an aggregate speed not exceeding 1.536 Mbps (1.544 with 8 control bits). An E1 line consists of one or more channels. Each channel is any one of 31 time slots. The E1 line operates at speeds in multiples of 64 Kbps to 1.984 Mbps, with the aggregate speed not exceeding 1.984 Mbps. Fractional: The T1/E1 channel is one of the following groupings of consecutively or nonconsecutively assigned time slots: N T/1 time slots (NX56/64Kbps where N = 1 to 23 T1 time slots per NT1 channel). N E1 time slots (NX64Kbps, where N = 1 to 30 time slots per E1channel).
Channel Bank	Equipment that performs TDM-type multiplexing of lower speed (generally voice converted to 64 Kbps digital) channels into a higher speed composite (generally in 24 channel groups of 1.544 Mbps each).
Channelized T1/E1	T1 or E1 service that is divided into individual 64 kbps channels (or channels that are multiples of 64 kbps such as a 256 kbps channel made from four 64 kbps channels), as opposed to unchannelized service, which uses the entire bandwidth of the T1 (1.544 Mbps) or E1 (2.048 Mbps). Channelized T1 or E1 lines can consist of switched lines with in-band signaling or leased lines.
Channel Service Unit (CSU)	User owned equipment installed on customer premises at the interface between customer premises and the operating phone company to terminate a DDS or T1 circuit. CSUs provide network protection and diagnostic capabilities.
Checksum	A technique used to check for errors in data. The sending application generates the checksum from the data being transmitted. The receiving application computes the checksum and compares it to the value computed and sent by the sending station
CIM	Computer-Integrated Manufacturing
Circuit Emulation Service	ATM Forum-defined service that provides a virtual circuit connection, which emulates the characteristics of a real, constant-bit-rate, dedicated-bandwidth circuit. Traffic over ATM networks that complies with the other ATM Forum interoperability agreements. Specifically, this specification supports emulation of existing TDM circuits over ATM networks.
Cladding	An optical material placed over or around the core or central part of an optical fiber; used to confine the light waves to the core
Class D addressing	Applications dynamically choose these special-purpose TCP/IP addresses when beginning a multicast session and then relinquish them at the end of the session.

Clear Channel	1. The characteristic of a transmission path where the full bandwidth is available to the user. 2. In T1, 64 Kbps channels that do not require some portion of the channel (typically 8 Kbps) being reserved for carrier framing or control bits.
Clear To Send (CTS)	A modem control signal, sent from the modem to the DTE (Data Terminal Equipment) in response to RTS (Request to Send) from the DTE, used to tell the DTE that the modem is ready to transmit data.
CLEC	Competitive Local Exchange Carrier – company that builds and operates communication networks in metropolitan areas and provides customers an alternative to the local telephone company.
Client-Server Model	A common way to describe network services and the user processes (programs) of those services. Examples include the name-server/name-resolver paradigm of the DNS and file-server/file-client relationships such as NFS and diskless hosts.
Client/server Computing	An application framework in which the processing load is divided among several processes called clients and servers. Clients issue requests to servers, which provide specialized services such as database processing and mail distribution. Within this framework, clients are able to concentrate on business logic whereas servers can use specialized hardware and software that allows them to provide their services more efficiently. When clients and servers are located in different computers, application processing is distributed over multiple computers and, in effect, the network becomes the computer.
CLNP	Connectionless Network Protocol - The OSI protocol for providing the OSI Connectionless Network Service (datagram service). CLNP is the OSI equivalent to Internet IP, and is sometimes called ISO IP
Clock	In data communications, a device (typically an oscillator) that generates precisely spaced timing pulses (or the pulses themselves) used for synchronizing transmissions and recording elapsed times.
Closed System	A proprietary system wherein the interface specifications are not made readily available to other manufacturers. A closed system does not provide support for OSI or ANSI standard protocols and interfaces
CLTP	Connectionless Transport Protocol - Provides for end-to-end Transport data addressing (via Transport selector) and error control (via checksum), but cannot guarantee delivery or provide flow control. The OSI equivalent of UDP.
Cluster Controller	A device that handles the remote communications processing for multiple terminals or workstations (i.e., IBM 3270-family controller).
CMIP	Common Management Information Protocol - The OSI network management protocol.

CMIS	Common Management Information Services
CMOT	CMIP Over TCP - An effort to use the OSI network management protocol to manage TCP/IP networks.
Coaxial Cable	Cable consisting of an outer conductor surrounding an inner conductor, with a layer of insulating material in between (generally provides a much higher band-width than twisted pair wire).
CODEC	A contraction of Coder/Decoder. A device that converts analog signals to a digital form for transmission over a digital medium (typically voice to 64 Kbps digital) and back to analog after transmission.
Committed Information Rate (CIR)	The guaranteed level of bandwidth available to a frame relay PVC. Connection from the frame relay switch to the frame relay attached device always reserves enough capacity for the CIR.
Common Carrier	A government regulated company responsible for providing telecommunications services in a given territory that allow users, at a cost, access to communications.
CCS7	Common Channel Signaling Version 7 - Also known as Signaling System 7 (SS7), a network standard that transmits call-handling information for telecom calls over a separate channel than that taken by the calls
Compression	A technique to "squash" files, making them smaller to optimize bandwidth utilization. Compression is important for WAN transmission and for disk and tape storage.
Conditioning	A procedure used to make circuit transmission impairments lie within certain acceptable limits which are specified in a tariff (typically used on telephone lines leased for data transmission to improve transmission speed and quality). Usually done with special equipment or routing.
Configuration Management	(CM) That area of network management that maintains, tracks, and controls the interrelationships of network equipment, services, circuits, and end-users.
Congestion Control	In ATM networks, congestion control schemes may be based on fields within the ATM cell header (CLP, EFCI within the PTI) or may be based on a more sophisticated mechanism between the ATM end-system and ATM switches. The ATM Forum has developed a mechanism based on rate control for ABR-type traffic. In Frame Relay networks, congestion is handled by the FECN, BECN and DE bits
Connection Oriented	The model of interconnection in which communication proceeds through three well-defined phases: Connection Establishment, Data Transfer, Connection Release. Examples: X.25, Internet TCP and OSI TP4, ordinary telephone calls.

Connectionless	The model of interconnection in which communication takes place without first establishing a connection. Sometimes (imprecisely) called datagram. Examples: LANs, Internet IP and OSI CLNP, UDP, ordinary postcards.
Connectionless Network Protocol	(CLNP) The ISO counterpart to the Internet Protocol, this protocol provides message services such as message priorities, route selection parameters, and security parameters.
Constant Bit Rate	One of the five ATM classes of service. CBR supports the transmission of a continuous bit stream of information, such as voice and video traffic, which requires a constant amount of bandwidth allocated to a connection for the duration of the transmission.
Contention	A condition arising when two or more data stations attempt to transmit at the same time using the same channel.
Convergence	In multipath networks, convergence is the time it takes in order for data traffic to begin using the alternate path. Timing typically controlled by times it takes to flush (clear) routing table and pass new route updates to neighbor devices.
Convergence Sublayer (CS)	Portion of the AAL that prepares information in a common format--a convergence sublayer protocol data unit (CS-PDU) before it is segmented into cells and returns it to its original form after reassembly at the destination switch.
Convergence Sublayer Protocol Data Unit (CS-PDU)	Information contained within a PDU that conforms to the specifications of the ATM convergence sublayer and is ready to be segmented into cells.
COS	Class of Service, categories of traffic types to distinguish real time and non-realtime (i.e. batch services) usage as well as variable and constant bit rates in ATM.
COS	Corporation for Open Systems - A vendor and user group for conformance testing, certification, and promotion of OSI products.
Cyclic Redundancy Check (CRC)	A data transmission error detection scheme based on a polymominal algorithm where the data to be sent is checked by the algorithm and the resultant checksum is appended to the end of the transmission. The receiving end performs the same algorithm and the results are compared to the checksum received (any difference indicates a transmission problem and the data is retransmitted until checksums agree).
CRC-6/CRC-9/CRC-16	Cyclic Redundancy Check and the number of checksum bits calculated and transmitted (CRC-6 is common for T1 ESF transmissions, CRC-9 for DS-3 Syntran transmissions, where as CRC-16 is more common for bit-oriented protocols like HDLC).
Cross-talk	Unwanted transfer of energy from one circuit to another (typically adjacent).

CSMA/CA	Carrier Sense Multiple Access local area network with Collision Avoidance such as Appletalk (LocalTalk).
CSMA/CD	Carrier Sense Multiple Access with Collision Detection - The access method used by local area networking technologies such as Ethernet.
Customer Information Control System (CICS)	An IBM program product and mainframe operating environment designed to enable transactions entered at remote terminals to be processed concurrently by user-written application programs (also includes facilities for building and maintaining databases).
Customer Premises/Customer Premises Equipment (CP/CPE)	In telephony, refers to the user's location and the equipment at that location that interfaces to the telephone network (also referred to as NCTE or Network Channel Terminating Equipment).

D

D4 frame	A T1 line uses the D4 format, also known as the superframe (SF) format, to frame data at the physical layer. The D4 format consists of 12 consecutive frames, each separated by framing bits.
DACS	(Digital Access and Cross Connect System - A digital switching device for routing and switching DS0s within T1 and E1 lines.
Daisy Chain	A connection arrangement in which each device is connected directly to the next device. For example, a daisy chain of devices A, B, C, and D might have A connected to B, B connected to C, and C connected to D. Also known as cascading.
Dark Fiber	Fiber without electronics.
DARPA	Defense Advances Research Projects Agency - The U.S. government agency that funded the ARPANET.
DASD	Direct Access Storage Device
Data Circuit-terminating Equipment (DCE)	A device that maintains and terminates a connection between the data terminal equipment and a communications facility (i.e., a modem).
Data Encryption Standard	A cryptographic algorithm designed by the National Bureau of Standards to encipher and decipher data using a 64-bit key (specified in Federal Information Processing Standard Publication 46, dated January 15, 1977).
Data Link Connection Identifier (DLCI)	A unique number assigned to a PVC end point in a frame relay network. Identifies a particular PVC endpoint within a user's access channel in a frame relay network and has local significance only to that PVC/channel.

Data Link Layer	The OSI layer that is responsible for data transfer across a single physical connection, or series of bridges connections, between two Network entities.
Data Service Unit (DSU)	A customer premises device that is used to interface to a digital circuit (i.e., DDS or T1 when combined with a CSU). The DSU performs conversion of customer's data stream to dipolar format for transmission.
Data Set Ready (DSR)	A modem control signal that is sent from the modem to the DTE. It is used to tell the DTE that the modem is ready to transmit data.
Data Terminal Equipment (DTE)	A device which transmits data to and/or receives data from a data communications system (i.e., a CPU or terminal).
Data Terminal Ready (DTR)	A modem control signal sent from the DTE to the modem, used to tell the modem that the DTE is ready to transmit data.
Dataphone Digital Service (DDS)	A trademark of AT&T used to identify a private line interstate service for digital data communications.
DCE	Distributed Computing Environment - An architecture of standard programming interfaces, conventions and server functionalities (e.g., naming, distributed file system, remote procedure call) for distributing applications transparently across networks of heterogeneous computers. Promoted and controlled by the Open Software Foundation (OSF), a consortium led by HP, DEC, and IBM. Se ONC.
DCF (WiFi/WLAN term)	Distributed Coordination Function (DCF) is A class of coordination function where the same coordination function logic is active in every station in the BSS whenever the network is in operation.
DDCMP	Dec's Digital Data Communications Message Protocol
DDN	Defense Data Network - Comprises the MILNET and several other DoD networks.
Decibel (dB)	Unit for measuring relative strength (ratio) of two signal parameters such as power, voltage, etc.
DECnet	Digital Equipment Corporation's proprietary network architecture.
Dedicated Line	A communications line provided to a single organization and used exclusively by that organization. (Also called leased line or private line).
Deregulation	The reduction in tariff, market entry and exit, and facilities regulation of public telecommunications services in response to competitive and technological pressures in the telecom industry.
Dial Backup	A network scheme using two dial-up lines (one for transmit and one for receive) for temporary data transmission when a dedicated line fails.

Dial-Up	Describing the process of, or the equipment or facilities involved in, establishing a temporary connection via the switched telephone network.
Differential Phase Shift Kkeying	A modulation technique that uses phase modulation. DPSK changes phase each time a 1 bit is transmitted and does not change phase for 0 bits.
Digital	In data communications, the description of the binary ("1/-") output of a computer or terminal. Modems convert the pulsating digital signals into analog waves for transmission over conventional telephone lines.
Digital Access and Cross-Connect System (DACS) (Also called DCS or DXS.)	A computerized or manual facility which allows DS-1 T1) lines to be remapped electronically at the DS-0 (64 Kbps) level.
Digital Cross Connect (DSX)	The standard patch panel access point found in Central Offices.
Digital Service Unit (DSU)	A user device interfacing to a digital circuit (such as DDS or T1 when combined with a CSU). The DSU converts the user's data stream to bipolar format for transmission.
Digital Signal Level 1(DS1/DS-1)	A telephony term describing the 1.544 Mbps digital signal carried on a T1 facility.
Digital Subscriber Line (DSL)	A modem technology for transmitting information at high speeds on existing copper phone lines to homes and businesses. DSL operates over existing copper telephone lines and requires runs of usually less than 20,000 feet to a central telephone office. Types of DSL include asymmetric DSL (ADSL), symmetric DSL (SDSL), and high bit rate DSL (HDSL).
DSLAM	Digital subscriber line access multiplexer - A device that splits communication over a DSL into a data switch or voice switch depending on the type of data being transmitted.
Digital Termination System (DTS)	A digital only microwave-based transmission technology designed for bypass functions for short-hop, line-of-site, high volume, pure-data applications (requires an FCC license and is referred to as DEMS or Digital Electronic Message Service).
Directory Services	Directory services provide a white pages-like directory of the users and resources located on an enterprise network. Instead of having to know a device's or user's specific network address, a directory service provides an English-like listing for a user. The OSI's X.5000 and Banyan's StreetTalk are examples of directory services.
Discard Eligibility (DE)	A bit indicating that a frame may be discarded in preference to other frames if congestion occurs, to maintain the committed quality of service within the network. Frames with the DE bit set are considered to be excess data. Frames transmitted in burst rate mode (above the CIR) are considered discard eligible.

Distortion	The unwanted change in waveform that occurs between two points in a transmission system. Amplitude distortion is caused by non-uniform gain or attenuation of a system with respect to its frequency. Delay distortion is caused by differences in transit time of frequencies within a given bandwidth under specified conditions. Non-Linear distortion is caused by a deviation in the linear relationship between the input and the output of a system or component.
Distributed Computing	In a distributed computing architecture, portions of the applications and the data are broken up and distributed among the server and client computers. In the older model, all applications and data resided on the same computer.
Divestiture	The break-up of AT&T in 1984, that included the separation of 22 AT&T owned local Bell Operation Companies (BOCs) into seven independent Regional Bell Holding Companies (RBHCs).
DNA	Dec's Digital Network Architecture.
DNS	Domain Name System - The distributed name/address mechanism used in the Internet.
Domain	In the Internet, a part of a naming hierarchy. Syntactically, an Internet domain name consists of a sequence of names (labels) separated by periods (dots), e.g., "tundra.mpk.ca.us." In OSI, "domain" is generally used as an administrative partition of a complex distributed system, as in MHS Private Management Domain (PRMD), and Directory Management Domain (DMD).
Dotted Decimal Notation	The syntactic representation for a 32-bit integer that consists of four 8-bit numbers written in base 10 with periods (dots) separating them. Used to represent IP addresses in the Internet as in: 192.67.67.20.
DQDB	Distributed Queue Dual Bus - IEEE Standard 802.6 for MANs
Drop Cable	In local area networks, a cable that connects perpendicularly to the main network cable or bus, and attaches to the DTE equipment.
Drop and Insert	A process of adding data (insert) to a T1 data stream, or terminating data (drop) from a T1 data stream to other devices connected to the drop-and-insert equipment.
DS3/DS-3	A telephony term describing communications access operating at 44.736 Mbps (equivalent to 28 T1 channels). Also called T3.
DSA	Directory System Agent - The software that provides the X.500 Directory Service for a portion of the directory information base. Generally, each DSA is responsible for the directory information for a single organization or organizational unit.

DSCP	Diff Serve Code Point – mechanism for application/traffic flow identification in a Quality of Service, Differentiated Services Model.
DUA	Directory User Agent - The software that accesses the X.500 Directory Service on behalf of the directory user. The directory user may be a person or another software element.
Dual-Attached Station (DAS)	In FDDI, a DAS connects to both of the dual, counter-rotating rings. Concentrators, bridges, and routers often use DAS connections for fault tolerance. In contrast, a Single-Attached Station (SAS) is connected to only one ring.
Dual Homing	In FDDI, dual homing is a method of cabling concentrators and stations in a tree configuration that permits an alternate path to the FDDI network in case the primary connection fails.

E

E1 Line	CCITT transmission rate, a 2.048 Mbps line that supports thirty-two 64 kbps channels, each of which can transmit and receive data or digitized voice. The line uses framing and signaling to achieve synchronous and reliable transmission. The most common configurations for E1 lines are E1 PRI, and unchannelized E1.
E1 PRI Line	An ISDN line that consists of thirty-two 64 kbps channels. This type of line uses 30 B channels for user data, one x 64 kbps D channel for ISDN D-channel signaling, and one framing channel. The B channels can be all switched, nailed up, or a combination of switched and nailed up. This type of PRI line is a standard in Europe and Asia called CEPT G.703.
E3	The European standard for high speed digital transmission, operating at 34 Mbps.
Earth Station	Ground-located communications equipment used in satellite communications.
Echo Cancellation	Echo cancellation improves the quality of voice transmissions. It eliminates the echo that results from the reflection of the telephony signal back to the caller, which can occur in a 4-wire to 2-wire hybrid connection between the VFRAD and the telephones or PBX. The longer it takes the signals to return to the caller, the more perceptible the echo.
Echo Signal	Distortion occurring when a transmitted signal is echoed back (reflected) to the originating station.
EGP	Exterior Gateway Protocol - A reachability routing protocol used by gateways in a two-level internet. EGP is used in the Internet core system.
Egress	Frame relay frames leaving a frame relay network in the direction toward the destination device. Contrast with Ingress.

EIA	(Electronic Industries Association) A standards organization in the U.S. specializing in the electrical and functional characteristics of interface equipment.
Electromagnetic Interference (EMI)	The noise on data transmission lines that reduces data integrity. It is caused by motors, machines, and other generators of electromagnetic radiation.
Electronic Switching System (ESS)	One of a family of AT&T manufactured, stored program control, central office switches (Most common are the 1, 1A, 4, and 5 switches).
EMA	Enterprise Management Architecture
Emulation	The imitation of all or part of one device, terminal, or computer by another, so that the imitating device accepts the same data, performs the same functions, and appears to the other network devices as the imitated device.
Encapsulation	The technique used by layered protocols in which a layer adds header information to the protocol data unit (PDU) form the layer above. As an example, in Internet terminology, a packet would contain a header from the physical layer, followed by a header from the network layer (IP), followed by a header from the transport layer (TCP), followed by the application protocol data.
Encoding/Decoding	The process of reforming information into a format suitable for transmission, and them reconverting it after transmission.
Encryption	The ciphering of data by applying an algorithm to plain text in order to convert it to ciphertext for secure transmission.
End System	An OSI system which contains application processes capable of communicating through all seven layers of OSI protocols. Equivalent to Internet host.
Enterprise Network	An information infrastructure, often combining private and public facilities, to cover all of the locations operated by a single company or corporate enterprise with a single communications fabric.
Entity	OSI terminology for a layer protocol machine. An entity within a layer performs the functions of the layer within a single computer system, accessing the layer entity below and providing services to the layer entity above at local service access points.
Equal Access	Mandated at divestiture, equal access requires that the Bell Operating Companies (BOCs) provide interexchange carriers (IECs), other that AT&T, the same access to the BOCs' central office switches as that provided for AT&T. This allows non-AT&T customers to dial long distance over their preferred IEC without having to dial extra digits.
Encryption	Radio waves are vulnerable to interception, which means that to be secure, data must be encrypted. Encryption renders the data unreadable to anyone without a passcode or a key

Error Rate	The ratio of incorrectly received data (Bits, elements, characters, or blocks) to the total amount of data transmitted.
ES-IS	End System to Intermediate System Protocol - The OSI protocol by which end systems announce themselves to intermediate systems.
Ethernet	A local area network that connects devices like computers, printers and terminals. Ethernet operates over fiber optics, twisted-pair or coaxial cable at speeds of 10, 100 Mbps and 1 Gigabit/sec. DIX Ethernet is a popular local area network design (trademarked by Digital, Intel & Xerox), standardized by IEEE as 802.3).
Explicit Routing	The ability to select a specific route not based on the shortest path and destination address, but based on a specific policy, quality of service, or virtual private network membership
Extended Binary Coded Decimal Interchange Code (EBCDIC)	An eight level code set (256 possible characters) commonly used with IBM mainframe systems.
Extended Superframe Format (ESF)	A T1 framing format that utilizes the 193rd bit as a framing bit, but whose Superframe is made up of 24 frames instead of 12 as in D4 format. ESF also provides CRC error detection and maintenance data link functions.

F

Fanout	The ability of a digital access cross connect (DAC) to split and switch channels between incoming and outgoing circuits.
Fault Tolerance	A way to provide redundancy in hardware systems to protect against if one of the redundant systems or components fails. For RAD products, fault tolerance is provided by means of redundant I/O modules, common logic and/or power supplies.
FCC	(Federal Communications Commission) - The regulatory agency established in the United States for all interstate radio and electronic communications.
FDDI	Fiber Distributed Data Interface - An emerging high-speed networking standard. The underlying medium is fiber optics, and the topology is a dual-attached, counter-rotating Token Rings. 100 Mbps.
Fiber	Fine glass or plastic strands, thinner than human hair, used for optical transmission of digital communications
Fiber Distributed Data	An American National Standards Institute standard for fiber-optic Interface (FDDI) links of up to 2 km in length
Fifty-six (56) Kbps	A standard speed for V.35 interface, DDS service, and also the effective top speed of a robbed-bit 64 Kbps channel.
File Server	In local area networks, a station dedicated to providing file and mass data storage services to the other stations on the network.

File transfer Protocol (FTP)	An upper-level TCP/IP service that allows copying files across a network.
Filter	Electronic circuitry that removes energy in unwanted frequencies, such as noise, form a transmission channel (may be analog or digital in operation).
Firmware	Programs kept in semi-permanent storage, such as various types of read-only memory. These programs can be altered, but with difficulty. Firmware is used in conjunction with hardware and software. It also shares the characteristics of both. Firmware is usually stored on PROMs (Programmable Read Only Memory) or EPROMs (Electrical PROMs). Software constantly called upon by a computer or phone system that is "burned" into a chip, becomes Firmware.
Flag	In bit-oriented communications, a bit pattern of six binary "1"s bounded by a binary "0" at each end (forms a 0111 1110 or Hex "7E"). It is used to mark the beginning and/or end of a frame.
Flooding	A technique used by a Layer2 bridge or LAN switch to locate/learn a destination not found in the bridge table by sending a packet out on all possible paths/interfaces. An acknowledgement from the receiving station contains the destination/source address of the packet, which is then added to the bridge table
Flow Control	The capability of network nodes to manage buffering schemes while handling devices operating at different rates, enabling them to talk to each other without loss of data.
Forward Explicit Congestion Notification (FECN)	A bit set by a frame relay network to notify an interface device (DTE) that congestion avoidance procedures should be initiated by the receiving device. See also BECN.
Four-Wire Circuit	A circuit or communications path consisting of two pairs of conductors (wires), one pair for transmitting and one pair for receiving.
Fractional T1	A service provided by carriers, where a full T1 link is leased to the customer, but the service charge is calculated based only on the number of timeslots used.
FRAD	(Frame Relay Access Device) A device responsible for framing data with header and trailer information (control information) before presenting the frame to the Frame Relay switch.
Fragmentation	Data packets are divided into small fragments, allowing higher priority voice packets to receive the right-of-way without waiting for the end of long data transmissions. The remaining data packets in the data stream are momentarily halted until the voice transmission gets through. The down-side of fragmentation is that it increases the number of data frames, thereby increasing the number of flags and headers. This increases overhead and reduces bandwidth efficiency.

Frame	A logical grouping of information sent as a link-layer unit over a transmission medium. The terms packet, datagram, segment, and message are also used to describe logical information groupings.
Frame Check Sequence (FCS)	Standard 16-bit cyclic redundancy check used for HDLC & frame relay protocols. The FCS detects bit errors occurring in the bits of the frame between the opening flag and the FCS, and is only effective in detecting errors in frames no larger than 4096 octets.
Frame Relay	A high-speed packet switching (10 times X.25) technology based on LAPD.
Frequency	The number of repetitions per time unit of a complete waveform. Typically the number of complete cycles per second, usually expressed in Hertz (Hz).
Frequency Modulation (FM)	Carrier transport technique that shifts the carrier frequency by an amount proportional to the value of the modulating signal.
Frequency Shift Keying (FSK)	A form of frequency modulation in which two possible states (1/0, on/off, etc.) are transmitted as two separate frequencies.
Front End Processor (FEP)	A dedicated computer linked to one or more host computers or multiuser minicomputers that performs data communications functions and serves to off-load the attached computers of network processing (i.e., IBM 3725 and IBM 3745).
Full Duplex	A circuit or device permitting transmission in two directions at the same time.

G

G.703	An ITU standard for the physical and electrical characteristics of various digital interfaces, including those at 64 kbps and 2.048 Mbps.
G.723.1	An ITU standard for voice compression.
G.802	ITU standard for carrying T1 traffic over E1 networks.
Gatekeeper	A device that manages an IP network, supporting all gateways, user profiles, and authentication. A gatekeeper is defined by the H.323 standard.
Gateway	Gateways are points of entrance and exit from a communications network. Viewed as a physical entity, a gateway is that node that translates between two otherwise incompatible networks or network segments. Gateways perform code and protocol conversion to facilitate traffic between data highways of differing architecture.

Geosynchronous Orbit	A satellite orbit in which the satellite is stationary with respect to the earth. The satellite is always positioned over the same location.
Grooming	In telecommunications, the process of separating and segregating channels by combing, such that the broadest channel possible can be assembled and sent across the longest practical link. The aim is to minimize de-multiplexing traffic and reshuffling it electrically.
Guardbands	Subchannel separators that are implemented in frequency division multiplexing to avoid crosstalk.
GUI	(Graphical User Interface) - this software interface is based on pictorial representations and menus of operations and files. Opposite of command line interface.

H

H.323	A set of International Telecommunication Union (ITU) standards that define a framework for the transmission of real-time voice communications by means of IP-based packet-switched networks. Created in response to customers who needed to use their existing IP networks to support voice communications, the H.323 standards define a gateway and a gatekeeper.
Half-Duplex	A circuit or device capable of transmitting in two directions, but not at the same time.
Hard-Wired	1. A link (remote telephone line or local cable) that permanently connects two nodes, stations, or devices. 2. Describes electronic circuitry that performs fixed logical operations by virtue of fixed circuit layout, not under control or stored-program control.
HDSL	(High Bit-Rate Digital Subscriber Line) - A high performance twisted pair transmission technology, best known as an enhanced transport mechanism for T1 or E1 service. It is designed for the Local Loop between a customer's premises and an area exchange central office. . The transmission speeds are equivalent to T-1 speeds (1.544 Mbps) or, in Europe, to E-1 speeds (2 Mbps). In contrast with ADSL, the transmission speed is synchronous, meaning that the speed is the same in both directions.
Head End	A passive component in a broadband transmission network that translates one range of frequencies (transmit) to a different frequency band (receive), allowing devices on a network to send and receive without the signals interfering with each other.
Header Error Control (HEC)	The last 1-byte field in an ATM cell's 5-byte header, the HEC field contains information that is used to detect and correct errors in the cell header. These sorts of errors are likely to corrupt addressing fields, causing the network to deliver the cell to the wrong destination or drop the cell and request retransmission. On fiber networks, header errors

	typically take one of two forms: relatively common single-bit errors and rarer error bursts. HEC uses the SECDEC (single error correction, double error detection) algorithm to fix single-bit errors and discard cells with multiple errors.
Header Error Control (HEC) Field	A single byte containing the information needed for the transmission convergence (TC) sublayer of the ATM physical (PHY) layer to perform error detection on the cell header. If errors are found, the cell is dropped before processing moves up to the ATM layer, where routing takes place.
Hertz (Hz)	A unit of frequency equal to one cycle per second.
High-Level Data Link Control	(HDLC) A CCITT-specified, bit-oriented, data link control protocol on which most other bit-oriented protocols are based. A positional synchronous protocol that operates in full-duplex mode in both point-to-point and multipoint configurations. Data is transmitted in fixed-format frames consisting of start flag, address, control, information, block check character, an end-of-frame flag. HDLC is an ISO standard similar to IBM's SDLC.
HSSI	(High-Speed Serial Interface) - A serial interface that operates at speeds up to 52 Mbps at distances up to 50 feet. It is similar to, but faster than, RS-232 and V.35 serial interfaces.
HTML	HyperText Markup Language, an SGML document type definition used as an authoring language for the World Wide Web.
Hunt Group	A group of channels that share the same phone number. When a call comes in using the phone number assigned to the hunt group, the switch hunts for an available channel in the group.
Hybrid Circuit	A circuit use to couple four-wire circuits to two-wire circuits.

I

IEEE	Institute of Electrical and Electronics Engineers
IEEE 802.3	The IEEE's specification for CSMA/CD LANs.
IEEE 802.4	The IEEE's specification for Token Bus LANs
IEEE 802.5	The IEEE's specification for Token Ring LANs.
IEEE 802.6 MANS	Institute of Electrical and Electronic Engineers standards for Metropolitan Area Networks
IEEE 802.11	The IEEE's specification for Wireless LANs.
Internet Engineering Task Force	The IETF organization provides the coordination of standards and specification development for TCP/IP networking.
Internet Group Management Protocol (IGMP)	IGMP allows users to sign up for multicast sessions and allows these groups to be managed dynamically, in a distributed fashion.

Impedance	The combined effect of resistance, inductance and capacitance on a transmitted signal. Impedance varies at different frequencies.
In-band Signaling	The transmission of signaling information over the same path as data and/or voice information. Another term for in-band signaling is robbed-bit signaling. Robbed-bit refers to the 8 kbps of each channel used for signaling. T1 access lines containing one or more switched channels, and switched-56 lines use in-band signaling.
Ingress	Frame relay frames from an access device toward the frame relay network. Contrast with Egress.
Interactive	Describing conversational, real-time data communications in which one user enters data and them waits for a response message from the destination before continuing (contrast with Batch processing).
Interexchange Carrier (IEC or IXC)	Since divestiture, any carrier registered with the FCC authorized to carry customer transmissions between LATAs interstate. In addition, if approved by a state public utility commission, intrastate which includes carriers such as AT&T Communications (formally AT&T Long Lines), MCI, and US Sprint.
Interface	A shared boundary, defined by common physical interconnection characteristics, signal characteristics, and meanings of exchanged signals.
Internet	Interconnection of LAN subnetworks through the use of Transport Protocol Routing (OSI Layer 3).
Internet Address	Also known as an IP address. This is a 32-bit hardware-independent address assigned to hosts using the TCP/IP protocol suite.
Integrated Services Digital Network (ISDN)	A CCITT standard defining an access and transport system that provides end-to-end digital service connectivity to support a wide range of applications - voice, data, video - and is accessed via a limited number of standard user interfaces
Interoffice Trunk	A direct trunk between local central offices.
Intra-LATA	Inside one Local Access and Transport Area.
Intranet	A private network that uses Internet technology such as hypertext documents and Internet protocols to store and retrieve data.
Inverse Multiplexing	A method of combining multiple E1/T1 links while to form a single logical link in order to optimize bandwidth usage. The inverse multiplexer slices the data stream into equal portions and transmits each portion over an available circuit. The receiving end adjusts for network-induced delay and reassembles the data packets into their proper order. Therefore, an inverse multiplexer allows lower speed channels across a network to be combined into a single, higher speed data stream
IP (Internet Protocol)	A networking protocol for providing a connectionless service to the higher transport protocol. It is responsible for discovering and maintaining topology information and for routing packets across

	homogeneous networks. Combined with TCP, it is commonly known as the TCP/IP platform.
IPng (IP Next Generation)	Version 6 of the Internet Protocol. IPv6 supersedes and provides significant improvements to IPv4. One major improvement is the expansion of the Internet address space from 32 bits to 128 bits.
IPL	Initial Program Load of a CPU.
I-PNNI	(Integrated Private Network-Network Interface) - Protocol used to exchange reachability information between routers that augment or replace protocols such as OSPF and IPX and is compatible with PNNI. This enables the integration of existing router-based connectionless networks with ATM networks.
IP Telephony	The transmission of voice over an Internet Protocol (IP) network. Also called Voice over IP (VoIP), IP telephony allows users to make phone calls over the Internet, intranets, or private LANs and WANs that use the TCP/IP protocol.
IPX	(Internetwork Packet Exchange) - Netware network layer (layer 3) protocol for transferring data from servers to workstations.
ISDN PRI/BRI	PRI - Primary Rate Interface (used between ISDN switches and provides 24 ISDN channels - 23 B (bearer) + 1D (signaling) channels) and BRI - Basic Rate Interface (used between end user equipment and ISDN switches and provides 3 ISDN channels - 2B + 1D channels)
ISDN BRI Line	An ISDN basic rate interface (BRI) line that uses two B channels for user data, and one 16 kbps D channel for ISDN D-channel signaling. Both B channels can be switched or nailed up, or one channel can be switched and the other nailed up. A line of this type can connect to standard voice service, switched 56 kbps data service or switched 64 kbps data service.
ISDN D-Channel Signaling	A type of signaling in which a D channel handles WAN synchronization and signaling and the B channels carry the user data. Another term for ISDN D-channel signaling is out-of-band signaling. T1 PRI, E1 PRI, and ISDN BRI lines use ISDN D-channel signaling.
ISDN Multirate	A network-based ISDN service which allows users network access equipment to dial network channels of bandwidth in increments of 64 kbps, up to 1536 kbps. Access to ISDN multirate service is obtained over ISDN PRI lines.
ISO	(International Standards Organization) - An international organization involved in writing communications standards.
ISP (Internet Service Provider)	A company that provides Internet access services to individual users and businesses.
ITU	(International Telecommunication Union) - A European-based, international advisory committee recommending worldwide standards for transmission.

J

JCL	Job Control Language
Jitter	The slight movement of a transmission signal in time or phase that can introduce errors and loss of synchronization in high-speed synchronous communications.
Job Entry Subsystem (JES)	A control protocol and procedure for directing host processing of a task in an IBM host environment.
Jumper	A patch cable or wire used to establish a circuit, often temporarily, for testing or diagnostics.

K

Kbps	Kilibits per second
Key Telephone System	Customer premises equipment (CPE) used to route calls both within an organization and to the outside telephone network. A key system is a scaled-down version of a PBX, usually with less functionality, and is geared toward smaller organizations. A key system can be either analog or digital. Some digital key systems can terminate digital as well as analog connections. Moreover, key systems work in conjunction with channel banks to distribute channels from the T1/E1 circuit for voice, video, fax and data.
Kermit	An asynchronous file transfer protocol designed for academic computing at Columbia University.

L

Label	A short, fixed-length identifier that is used to determine the forwarding of a packet using the exact match algorithm and which is usually rewritten during forwarding.
Label Switching	The generic term used here to describe all approaches to forwarding IP packets using a label swapping forwarding algorithm under the control of network layer routing algorithms.
LAN analyzer	A diagnostic tool that monitors network traffic, captures and displays data sent over the network, generates network traffic to simulate load or error conditions, tests cables for faults, and provides data helpful for system configuration and management.
LAN bridges and routers	Methods of extending LANs over wide areas. Bridges will work with all protocols, routers are protocol specific.
LAN Emulation	A way for legacy LAN MAC-layer protocols like Ethernet and token ring, and all higher-layer protocols and applications, to access work transparently across an ATM network. LAN emulation retains all

	Ethernet and token ring drivers and adapters; no modifications need to be made to Ethernet or token ring end-stations.
LAN Emulation Network Node Interface (LNNI)	The interface between two LANE servers (not to be confused with NNI [network node interface], the interface between ATM switches and networks). LANE 1.0 only defines a single server, but multiple servers are needed if LAN emulation is to scale across very large networks and to ensure interoperability among LANE service components. LNNI is a part of the LANE 2.0, which is expected to be finished by April 1997.
LAN Emulation	Enables one vendor's implementation of LAN emulation to work Network-to-Network Interface with another's. This specification is essential for building multivendor (LNNI) ATM networks and is currently under development at the ATM Forum.
LAN Emulation User Network Interface (L-UNI)	Defines how legacy LAN applications and protocols work with ATM. L-UNI is currently under development at the ATM Forum, L-UNI adapts Layer 2 LAN packets to AAL 5 PDUs, which can then be divided into cells. L-UNI uses a client-server architecture to resolve LAN-to-ATM addresses, the most complex aspect of LAN emulation. A LAN emulation client (LEC) resides in each ATM-attached device; a LAN emulation server (LES) and broadcast and unknown server (BUS) reside anywhere on the ATM network. When a legacy LAN end-station sends a message across the ATM network to another legacy end-station, the LEC requests ATM address and routing information from the LES and BUS, which correlate the MAC-layer LAN address of the destination with the ATM addresses needed to traverse the backbone.
LAPB/LAPD/LAPM	LAPB is a newer version of LAP specified for Balanced applications (either node may initiate transmission, rather that just one as in a master/slave arrangement); LAPD is specified for ISDN applications and differs from LAPB in its framing sequence; LAPM is specified for a new CCITT modem error control standard, and is based on LAPD.
Laser	A device that transmits an extremely narrow and coherent beam of electromagnetic energy in the visible light spectrum. Used as a light source for optical-fiber transmission (generally more expensive, shorter lived, single mode only, for greater distances than LED).
Latency	The time between initiating a request for data and the beginning of the actual data transfer. Network latency is the delay introduced when a packet is momentarily stored, analyzed and then forwarded.
LDP (Label Dist. Protocol)	The protocol used to distribute labels/tags in a MPLS network.
Leaky Bucket	A flow control algorithm, where cells are monitored to check whether they comply with the established connection parameters. Non-conforming cells are either tagged or dropped from the network. The analogy is taken from a bucket with a hole in its bottom that allows the fluid to flow out at a certain rate.

Learning Bridge	Bridge that builds its own routing table from the messages it receives, rather than having a predefined routing table. Also known as a transparent bridge.
Leased Line	A dedicated circuit, typically supplied by the telephone company or transmission authority, that permanently connects two or more user locations, and is for the sole use of the subscriber. Such circuits are generally voice grade in capacity and in the range of frequencies supported. Typically analog, and used for voice or data, can be point-to-point or multipoint, and can be enhanced with line conditioning. Also called private line.
LEC	Local Exchange Carrier
LED (Light Emitting Diode)	A semiconductor light source that emits light in the optical frequency band or the infrared frequency band. LEDs are a major light source for optical fiber transmission used with multimode optical fiber in applications that require a low cost light source.
Limited Distance Modem (LDM)	A relatively low-cost modem used on customer premises for transmitting data within or between buildings (typically up to a few
Line Driver	A signal converter which conditions a digital signal to ensure reliable transmission over an extended distance.
Link Access Procedure (LAP)	The Data Link-level protocol specified in the CCITT X.25 interface standard.
LMI (Local Management Interface)	An ITU-T defined interface to provide an ATM or Frame Relay end system user with network management information.
Loading	The addition of inductance to a line in order to minimize amplitude distortion. Used commonly on public telephone lines to improve voice quality, it can make the lines impassable to high speed data and baseband modems.
Load Balancing	A technique that distributes network traffic along parallel paths in order to maximize the available network bandwidth while providing redundancy.
Loading Coil	An induction device employed in local loops exceeding 18,000 feet in length, that compensates for wire capacitance and boosts voice grade frequencies. often removed for higher speed data services, as distortion will occur at frequencies higher that those used for voice.
Local Access and Transport Area (LATA)	One of 161 geographic areas within which a local exchange company may provide service. InterLATA service is provided by long distance (interexchange) carriers.
Local Area Network (LAN)	A communication network that interconnects a variety of computing equipment and peripherals; used for communicating data within a limited geographical area, typically within a single building
Local Loop	The physical wires that run from the subscriber's telephone set, PBX, or key telephone system to the telephone company's central office. Increasingly, the Local Loop now goes from the main distribution frame

	at the customer premises to the telephone company. The subscriber is responsible for connecting his wires from the box at the customer's premises to his phone, PBX, or key system.
Logical Link Control (LLC)	A protocol developed by the IEEE 802 committee common to all of its LAN standards, for Data-Link level transmission control. Typically complements the MAC protocol as its upper OSI Layer 2 sublayer, designated IEEE 802.2 (includes end-system addressing and error checking).
Logical Unit (LU)	The port, or network-addressable device, that provides access to a device on the network. For example, LU 6.2 is the IBM protocol that provides peer-to-peer communication over an SNA network; LU 6.2 is also referred to as APPC.
Long Haul Communications	In the public telephone network, a term of indefinite meaning describing circuits spanning considerable distances, generally applied to interLATA or interstate communications.
Longitudinal Redundancy Check (LRC)	A system of error control, based on the formation of a block check following preset rules, which is applied in the same manner to each character (as in parity checking of all characters in a block).
Loopback	A diagnostic feature provided in modems and CSUs to permit end-to-end testing of systems for a single location.
LSP	Label Switched Path.
LSR	Label Switching Router. A LSR is a device that supports both the standard IP control component (i.e. routing protocols, RSVP, etc) and a label swapping forwarding component.
LWAPP	Light Weight Access Point Protocol Label Switching Router (IETF) draft standard, (IETF) draft standard LWAPP is meant to be a network protocol for access points that also provides for centralized management. The idea for LWAPP started with the observation that access points work as access servers with IP addresses. LWAPP is meant to be the open, standard protocol for access point management. In turn, this would be used as the foundation for network management programs that could be controlled from a switch or router console. Once deployed, LWAPP's first goal will be to reduce the filter and policy processing needed in an access point. That work will be centralized and any changes will be broadcast to the access points. Then, LWAPP designers will also use this same centralized management architecture to deal with traffic management, authentication, encryption, and policy enforcement.

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M

M13	A designation for a multiplexer which interfaces between 28 DS1s and one DS3 circuit.
MAC (Media Access Control)	A protocol that defines the way workstations gain access to transmission media, most widely used in reference to LANs. For IEEE LANs, the MAC layer is the lower sublayer of the data link layer protocol
Manchester Encoding	A digital encoding technique in which each bit period is divided into two complementary halves: a negative-to-positive transition in the middle of the bit period designates a binary "1", while a positive-to-negative transition represents a "0". This encoding technique is self-clocking (the receiving device can recover transmitted clock from the data stream).
Manufacturing Automation Protocol (MAP)	A General Motors originated set of networking protocols, for the factory floor, that specify the use of internationally recognized standards, based on the OSI Reference Model.
Mark	In telecommunications, the presence of a signal. A mark is equivalent to a binary "1".
Master Clock	The source of timing signals (or the signals themselves) that all network stations use for synchronization.
Mbps	Megabits per second
Mean Time Between Failures	MTBF is a measure of the average amount of time a given component can be expected to operate before failing**.**
Mean Time to Repair	MTTR is **t**he average amount of time required to repair a broken piece of equipment and restore it to service.
Media	The path along which or through which the signal energy is propagated (e.g. wire, optical glass fiber, free space, guided paths such as wave guides, etc.
Metropolitan Area Network (MAN)	A network that extends to the 50 kilometer range, operates at speeds from 1 to 200 Mbps, and provides an integrated set of services for real-time data, voice, and image transmission (being defined by both the IEEE 802 committee and ANSI X3T9.5).
MIB	Management Information Base; a conceptual composite of information about all managed objects in an open system. Part of SNMP protocol.
Microwave	An electromagnetic wave in the radio frequency spectrum above 890 MHz (frequencies between 1 GHz and 30 GHz).
MIPS	Million Instructions Per Second

Mobile Station	A station that uses the network while in motion.
Modal Dispersion	The spreading of light as it travels down an optical fiber.
Modem	A contraction for Modulator-Demodulator. This device converts digital signals into analog for transmission over analog lines, and then converts the signals back to digital at the other end of the line (common types are the Bell 103 series of 300 bps, full-duplex, asynchronous dial modems; the Bell 212A 0-300/1200 bps full-duplex, dial modems; the Bell 201 series of 2400 bps, synchronous, dial modems; the Bell 208 series of 4800 bps, synchronous modems; and the Bell 209 series 9600 bps, synchronous modems).
Modulation	The process of altering a carrier wave in relationship to the value or samples of the information being transferred.
Modulo N	In communications, refers to a quantity, such as the number of frames or packets to be counted before the counter resets to zero. Relates to the number of frames or packets that can be outstanding from a transmitter before an acknowledgment is required from the receiver. Also indicates the maximum number of frames or packets stored, in case a retransmission is required (i.e., Modulo 8 or Modulo 128).
MPLS	Multi-Protocol Label switching. The name of the IETF working group that is standardizing label (Tag) switching.
Multicast	A Multicast address is an IEEE MAC address that has the Group bit set. A Multicast frame is one with a Multicast destination or receiver address. A frame with a Multicast address is intended to be delivered to more than one destination.
Multicasting	Conserves bandwidth by sending a single stream of data, rather than multiple point-to-point streams.
Multicast Routing	Multicast packets are routed through the network using enhanced routing protocols, including the Distance Vector Multicast Routing Protocol, the Multicast Open Shortest Path First protocol, and Protocol-Independent Multicast.
Multidrop	A communications arrangement where multiple devices share a common transmission channel, although generally only one may transmit at a time.
Multimode Fiber	A fiber with a large core diameter. 50-200 microns compared with the wavelength of light. It therefore propagates more than one mode. With multimode fiber, light traverses multiple paths, some longer than others. This leads to dispersion which reduces optical range at high bit rates
Multiplexing	An operation that combines two or more information paths into a single communications channel.
Multiplexer	At one end of a communications link, a device that combines several lower speed transmission channels into a single high speed channel. A multiplexer at the other end reverses the process. Sometimes called a mux.

Multipoint	A configuration or topology, designed to transmit data between a central site and a number of remote terminals on the same circuit. Individual terminals will generally be able to transmit to the central site but not to each other.
Multistation Access Unit (MAU)	A wiring concentrator used in Token Ring local area networks.
Mx3	A designation for a multiplex which interfaces between any of the following circuit combinations: 28 DS1s to one DS3 (M13), 14 DS1Cs to one DS3 (MC3), or 7 DS2s to one DS3 (M23).

N

Network Access Point	A NAP is an Internet connection and exchange point. It provides high-speed connection to major ISPs and to other NAPs.
NAK	A communication control character transmitted by a receiver as a negative acknowledgment (i.e., "message not received" or "transmission not acceptable").
NetMaster	Network management product from Cincom
NetView	An IBM network management architecture that allows communication at a peer-to-peer level to other management systems. Manages SNA and TCP/IP Networks.
NetWare	Software products for local area networking by Novell, Inc.
Network Architecture	A set of design principles, including the organization of functions and the description of data formats and procedures, used as the basis for the design and implementation of a network.
Network Basic Input/Output System (NetBIOS)	Software developed by IBM that provides the interface between a PC's operating system, the I/O bus and the network; a defacto network standard.
Network Control Center (NCC)	Any centralized network diagnostic and management station or site, such as that of a packet switching network.
Network Control Program (NCP)	An IBM host generated program that controls the operation of a communications controller (i.e., IBM 3725 and IBM 3745).
Network Driver Interface common Specification (NDIS)	A specification developed by Microsoft and 3Com to provide a application programming interface for LAN adapter device drivers and higher-level protocols. NDIS can support multiple protocols at the same time on a single LAN adapter. NDIS also lets higher-level software avoid having to know how to work with many different LAN adapters.
Network File System (NFS)	An extension of TCP/IP that allows files on remote nodes on a network to appear locally connected.
Network Interface Card (NIC)	A printed circuit board installed into a network device. When the card is cabled, the NIC allows the device to communicate on a network.

Network Manager	An application that receives Simple Network Management Protocol (SNMP) information from an agent. An agent and manager share a database of information, called the Management Information Base (MIB). An agent can use a message called a traps-PDU to send unsolicited information to the manager. A manager that uses the MIB can query the device, set parameters, sound alarms when certain conditions appear and perform other administrative tasks.
Network Management (NM)	The systematic procedures for planning, organizing, and controlling an evolving communication network with optimum cost and performance
Network-to-Network Interface (NNI)	Interface between ATM network nodes (switches) defined in the ATM Forum's UNI (user network interface).
Network Layer	A layer in the OSI reference model. The network layer provides address resolution and routing protocols. Address resolution enables the network layer to determine a unique network address for a node. Routing protocols allow data to flow between networks and reach their proper destination. Examples of network layer protocols are Address Resolution Protocol (ARP), Datagram Delivery Protocol (DDP), Internet Control Message Protocol (ICMP), Interior Gateway Protocol (IGP), Internet Protocol (IP), Internetwork Packet Exchange (IPX) and Packet Layer Protocol (PLP).
Node	A point of interconnection to a network
Noise	Any extraneous and unwanted signal disturbances in a link (Usually random variations in signal voltage or current, or interfering signals).
Nonreturn to Zero (NRZ)	A binary encoding scheme in which one and zeroes are represented by opposite and alternating high and low voltages and where there is no return to a zero (reference) voltage between encoded bits.
Nonreturn to Zero Inverted (NRZI)	A binary encoding scheme that inverts the signal on a "1" and leaves the signal unchanged for a "0". (Also called transition coding.)
Null Modem	A device that reverses certain serial interface leads so that DTEs can communicate over RS-232 cables without the need for modems (sometimes integrated into the cable wiring itself and called a null modem cable).

O

Optical Carrier (OC)	A hierarchy of optical signals used to classify speeds or capacities of fiber lines, especially as related to the SONET standard. The basic speed is OC-1 (52 Mbps). OC-3 fiber line has a capacity of 155 Mbps
On-Hook	The condition when the handset is on the telephone cradle signaling that it is not in use.
ONMA	Open Network Management Architecture from IBM
Open Data-Link Interface (ODI)	A Novell specification that is similar in purpose to NDIS. Like NDIS, ODI provides a common application programming interface for LAN

	adapter device drivers and higher-level protocols. ODI can support multiple protocols at the same time on a single LAN adapter. It lets higher-level software avoid having to know how to work with many different LAN adapters.
Open Network	A network adhering to the agreed-to national and international standards resulting from the Open Systems Interconnection model
Open Systems Interconnection	(OSI) The seven-layer reference model developed by the International Standards Organization for connecting computing equipment that has different communication protocols. The layers are physical, data link, network, transport, session, presentation, and application
Operations, Administration, and Maintenance (OAM)	A range of diverse network management functions performed by dedicated ATM cells, including fault and performance management (operations); addressing, data collection, and usage monitoring (administration); and analysis, diagnosis, and repair of network faults (maintenance). OAM cells do not help segmentation and reassembly.
OAM Flow Reference Architecture	This reference model, also known as the management plane reference architecture, defines the aspects of an ATM point-to-point virtual Circuit (VC) that can be monitored and controlled using specialized OAM cells. The reference model divides a VC into five distinct layers, labeled F1 through F5. It also defines the flows of ATM cells through these layers. <u>The F levels are as follows</u>: The F1 level defines the flow of cells at the lowest physical layer of the ATM stack, the Sonet (Synchronous Optical Network) section layer (also known as the regeneration section level). A typical transmission path for cells at F1 would be through a Sonet repeater in a WAN. The F2 level defines the flow of cells at the Sonet line layer (also called the digital section level). An example of an F2 function is the transmission of cells between two lightwave terminal equipment devices in a Sonet network. The F3 level partially defines the flow between a virtual path (VP) and a VC. In a large ATM network, a VC typically joins a VP, traverses it, and then splits out into a separate VC again. Traffic is forwarded from the VC to the VP and back to a VC again via a cell relaying function (CRF). F3 defines the flows between the VC and the CRF and between two CRFs. The F4 level completes the definition of the traffic flow between a VP and a VC. F4 describes the transmission of cells from an end-station, across a VC, through a CRF, and onto a VP. F4 stops at the second CRF (also known as the VP CRF). The F5 level completes the definition of traffic flow from one ATM end-station to another. The flow goes from VC to CRF to VP and VP CRF, then to VC again, and finally to the destination.

Optical Carrier (OC-n)	Fundamental unit in the Sonet (Synchronous Optical Network) hierarchy. OC indicates a fiber optical signal and n represents increments of 51.84 Mbit/s OC-1 = 51 Mbps OC-3 = 155Mbps OC-12 = 622 Mbps OC-48 = 2.048 Gbps OC-192 = 10 Gbps
Original Equipment Manufacturer (OEM)	The maker of equipment that is marketed by another vendor, usually under the name of the reseller.
OSPF – Open Shortest Path First	A standard link-state Internet Protocol (IP) routing protocol.
Out-of-Band Connection	A remote link, or a link outside connected networks, established over a modem. It is useful when network communications are not available.
Out-of-Band Signaling	The transmission of signaling information over a different path from data and/or voice information. CCS7 uses out-of-band signaling.

P

Packet	An ordered group of data and control signals trthrough a network, as a subset of a larger message
Packet Assembler	A network interface device that allows multiple asynchronous and/or synchronous terminals or lost computer ports to interface to a packet-switching network. A protocol conversion device that allows user terminals not equipped for packet switching to communicate over an X.25 based channel.
Packet Switching	A data transmission technique where user information is segmented and routed in discrete data envelopes called packets, each with its own appended control information for routing, sequencing, and error checking. It allows a communications channel to be shared by many users, each using the circuit only for the time required to transmit a single packet.
Parity Bit	An additional non-information bit appended to a group of bits, typically to a 7 or 8 bit byte to make the number of "1"s in the group of bits either an odd or even number.
Parity Check	A checking system that tests to ensure that the number of "1"s or "0"s in an array of binary digits is consistently odd or even. Parity checking detects characters, blocks, or other bit groupings that contain single errors.
Patch Panel	A device on which temporary connections may be made, especially for modifying or reconfiguring a system, by patching cables into the appropriate receptacles.

Payload	Information portion of an ATM cell, exclusive of header. ATM cells typically have 48-byte payloads, but size can vary depending upon type of data and AAL.
Payload Type Indicator (PTI)	A three-bit field in the ATM cell header. The first bit indicates which AAL was used to format the data in the payload; the second provides explicit forward congestion indication (EFCI), which alerts the application of possible delays by informing it of congestion behind the cell; the third indicates whether the cell contains data OAM information.
Peak Cell Rate (PCR)	An ATM traffic parameter (in cells per second) that characterizes the source and gives the maximum rate at which cells can be transmitted. It is calculated as the reciprocal of the minimum intercell interval (the time between two cells) over a given virtual connection (VC)
Performance Management	(PM) That area of network management that allows a network to operate more cost effectively and meet its established standards for performance and service
Permanent Virtual Circuit	A virtual circuit resembling a leased line (the invariant logical channel numbers allow it to be dedicated to a single user).
Phase Jitter	In telephony, the measurement in degrees that an analog signal deviates from the referenced phase of the main data-carrying signal. Often caused by alternating current components in a telecommunications network.
Phase Modulation (PM)	A transmission technique where the phase angle of the carrier signal is varied by the value of the signal to be transmitted.
Phase Shift	A change in time that a signal is delayed with respect to a reference signal.
Photonic Switching	A switching system using light and other forms of radiant energy who's quantum unit is the photon
Physical Layer (PHY)	The bottom layer of the ATM protocol stack, which defines the interface between ATM traffic and the physical media. The PHY consists of two sublayers: the physical medium-dependent (PMD) sublayer and the transmission convergence (TC) sublayer.
Physical Medium-Dependent (PMD) Sublayer	Defines the actual speed at which ATM traffic can be transmitted across a given physical medium. The ATM Forum has approved three Sonet interfaces for UNI: STS-1 at 51.84 Mbit/s, STS-3c at 155.52 Mbit/s, and STS-12c at 622.08 Mbit/s, as well as DS-1 (T1) at 1.544 Mbit/s, E1 at 2.048 Mbit/s, E3 at 34.368 Mbit/s, and DS-3 (T3) at 44.73 Mbit/s. The ATM forum also has adopted a number of specifications for LAN environments, including a 100-Mbit/s interface using FDDI encoding, a 155-Mbit/s interface using Category 5 UTP (unshielded twisted-pair), and a 51-Mbit/s interface using Category 3 UTP.

Plesiochronous	In T1, refers to a condition where the Bell System and an OCC (other common carrier) both provide very accurate clock sources. A signal traversing through them will maintain synchronization, although any one node in the network may not be referenced to the same clock as any other node.
Point of Presence (POP)	A physical layer within a LATA at which an interLATA carrier establishes itself for the purpose of obtaining LATA access and to which the local exchange company provides access services. The point at which the local telephone company terminates subscribers' circuits for long-distance dial-up or leased-line communications.
Point-to-Point Protocol (PPP)	A protocol used to provide serial transmission to the Internet over serial point-to-point links such as switched telephone connections. Also, a protocol that allows routers to establish data link connections and to exchange configuration information.
Polarity	Any condition in which there are two opposing voltage levels or charges, such as positive and negative.
Polling	A centrally controlled method of calling a number of terminals, to permit them to transmit information. As an alternative to contention, polling ensures that no single terminal is kept waiting for as long a time as it might under a contention network.
Primary Rate Interface (PRI)	A level of service for ISDN (in the U.S. 23 64 Kbps "B" channels for information transfer and 1 64 Kbps "D" channel for control and signaling).
Private Network-to-Network Interface (PNNI)	A routing information protocol that allows different vendors' ATM switches to be integrated in the same network. PNNI automatically and dynamically will distribute routing information, enabling any switch to determine a path to any other switch.
Propagation Delay	The time it takes for a signal, composed of electromagnetic energy, to travel from one point to another over a transmission channel.
Protocol	A set of rules and formats by which a communication network is operated in order to perform a specified communications function.
Protocol Data Unit (PDU)	A discrete piece of information (such as a packet or frame) in the appropriate format to be segmented and encapsulated.
Protocol Independent Multicast	PIM is a multicast routing protocol being standardized in the IETF.
Pulse Code Modulation (PCM)	Technique for digitizing speech that samples sound waves 8,000 times a second and converts each sample into an 8-bit binary number resulting in a 64,000 bit-per-second signal, the size of a traditional voice channel

Q

Q.922 Annex A (Q.922A)	International draft standard that defines the structure of frame relay frames. Based on the Q.922A frame format developed by the

	CCITT. All frame relay frames entering a frame relay network automatically conform to this structure.
Q.922A Frame	Variable-length unit of data, formatted in frame-relay (Q.922A) format, that is transmitted through a frame relay network as pure data (i.e., it contains no flow control information).
Q.931	An international (CCITT) standard for transmitting signaling information on ISDN
Queued Packet Synchronous (QPSX)	An Australian proposal for standard fiber-optic interfaces; now Switch referred to as DQDB.
Quality Of Service (QoS)	A group of service classes defined by the ATM forum in terms of different QoS parameters: Class 0 refers to the best effort service (UBR). Class 1 specifies the parameters for circuit emulation, and the transport of CBR uncompressed video and for VPNs. AAL1 supports this kind of delay sensitive connection oriented service. Class 2 specifies the parameters for the transport of VBR (low speed or compressed packetized) audio and video. AAL2 supports this delay sensitive, connection oriented class. Class 3 specifies the parameters for connection oriented data transfer. AAL3/4 and mostly AAL5 support this delay tolerant class, which is intended to provide interoperability with SMDS and IP. Class 4 specifies the parameters for connectionless data transfer. AAL3/4 or AAL5 can be used to support this delay tolerant class, which is also intended to provide interoperability with SMDS and IP. Class X refers to the connection oriented transport service where the traffic type (CBR or VBR) and timing requirements (delay sensitive or non-sensitive) are defined by the user. It is known as an unrestricted service class and which is supported by AAL5.

R

Real-time Transport Protocol (RTP)	Works alongside TCP to furnish end-to-end delivery of real-time data.
Real-time Transport Control Protocol (RTCP)	Part of RTP that provides monitoring and control functions, including feedback on current reception quality and the identities of those receiving the multicast stream.
Reduced Instruction Set Computing (RISC)	An internal computing architecture where processor instructions are pared down so that most can be performed in a single processor cycle, theoretically improving computing efficiency.

Redundancy Array of Inexpensive Drives (RAID)	Specifies several different techniques (mirroring and/or striping) of spreading data across multiple drives. RAID lets servers issue simultaneous requests for data to multiple drives. With the RAID specifications you get increased reliability. Mirroring, one drive is a direct copy of another drive, provides the greatest performance enhancement but at the greatest cost. Striping, in which files are spread over several drives and protected with data on still another drive, is used when data protection is needed but performance is not a high Priority.
Reference Clock	A clock of high stability and accuracy that is used to govern the frequency of a network and mutually synchronize clocks of lower stability.
Repeater	A device in which received signals are automatically amplified, restored, or reshaped to compensate for distortion and/or attenuation prior to retransmission.
Resource Reservation Protocol (RSVP)	RSVP permits the reservation of network bandwidth and assigning of priorities to various traffic types resources to provide quality of service guarantees to application flows.
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RJE	Remote Job Entry
RMON	The Remote Monitoring MIB, which allows a network monitoring device to be configured and read from remote locations

S

Secure Socket Layer (SSL)	A protocol used to provide secure network transactions, particularly on the Internet.
Synchronous Data Link Control	SDLC is an IBM positional synchronous protocol that operates in full-duplex or half-duplex mode in point-to-point and multipoint configurations. Data is transmitted in fixed-format frames consisting of start flag, address, control, information, block check character, and end-of-frame flag.
Synchronous Digital Hierarchy (SDH)	International form of Sonet. SDH is built on blocks of 155.52 Mbit/s; Sonet, 51.84 Mbit/s. SDH is the European and Japanese standard for using optical media as the physical transport for high speed long haul networks.
Security Management	(SM) That area of network management that provides for access control, authorization facilities, and partitioning the network.
Serial Line Internet Protocol	SLIP is a protocol used for Internet access over serial lines, such as dial-up telephone access. SLIP has been generally replaced by the newer point-to-point protocol.
Serial Transmission	The normal mode of data communications where character bits are transmitted one at a time instead of in parallel blocks as with internal CPU data transfer.

Session	A connection (may be logical) between two stations that allows them to communicate.
Simplex Transmission	A mode of data transmission in which data may flow in only one direction. One station is always a sender and another is always a receiver over a simplex link.
Small Computer System Interface (SCSI)	A standard high-speed parallel interface defined by the X379.2 committee of the American National Standards Institute (ANSI). A SCSI interface is used for connecting PCs to peripheral devices, such as hard disks and printers, and to other computers and local area networks. Up to seven devices, not including the PC, can be attached through a single SCSI connection through sequential connections called a daisy chain.
SNA	System Network Architecture is IBM's architecture for building a computer network. Encompasses hardware and software components, establishment of sessions between users, and capabilities such as office and message/file distribution services.
SNMP	Simple Network Management Protocol provides a guideline for creating network management software products. SNMP has four key components: the SNMP protocol, Structure of Management Information, Management Information Base, and Network Management System.
Simple Mail Transfer Protocol	SMTP is a protocol within the TCP/IP protocol suite. SMTP is an application layer protocol used to implement mail services and message transfer.
Single-mode Fiber	The fastest fiber optic technique, in which the light is guided down the center of an extremely narrow core.
Software Defined Network (SDN)	AT&T offering that allows users to customize and manage a virtual private network for voice traffic within AT&T's public network. A SDN gives users flexible, software-driven control over network topology, so that network reconfigurations can be done dynamically.
Source Routing	A learning bridge algorithm in which the sending node is responsible for determining the route to the destination node. The routing information is appended to the message and the bridges along the route use the routing information to move the message from the source to destination. Typically used in 802.5 Token Ring networks.
Spamming	The practice of inserting extraneous words into World Wide Web documents or the sending of hundreds or thousands of e-mail messages to a user. In the latter case, the people responsible for spamming typically take retribution for some perceived wrong by overwhelming the user's mailbox and disrupting their use of the Internet.
Spanning Tree	A method by which learning bridges build their own routing table
Spanning Tree Algorithm	A learning bridge algorithm in which bridges exchange routing information. Based on the routing information thus received, each bridge maintains a routing table that shows how to route messages to other LANs with allowing loops in the network

Spectrum	The medium for transporting radio signals is electromagnetic spectrum. Spectrum is a limited resource. Overcrowding it with too many transmissions can cause failures in security and reliability.
Synchronous Optical Network (Sonet)	Spectrum An international suite of standards for transmitting digital over optical interfaces. "Synchronous" indicates that all component portions of the Sonet signal can be tied to a single reference clock.
SS7	Signaling System #7
Statistical Time Division	STDMs are TDMs with an added microprocessor that provides more intelligent data flow control and enhanced functionality, such as error control and more sophisticated user diagnostics. The major difference between TDMs and STDMs is that stat muxes dynamically allocate time slots on the link to inputting devices on an as-needed basis (rather than in round-robin fashion where all devices are polled in preordained order). Therefore, there is no idle time on the link because a device does not have information to send. Unlike TDMs, STDMs have buffers for holding data from attached devices. They can handle a combined input speed (aggregate speed) that exceeds the speed of the communications link.
Store And Forward	A mechanism that allows messages to be stored at some point in a network when a complete transmission path to the receiving terminal is not available and then retransmits them when a transmission line becomes free.
Superconductivity	A property of many metals, alloys and chemical compounds at temperatures near absolute zero by virtue of which their electrical resistance vanishes and they become strongly diamagnetic
Switching	A general term given to the processing of a message, packet, cell, or frame. Most often is applied to layer-2 Data Link Control services.
Switched Line	A communications link for which the physical path, established by dialing, may vary with each use.
Switched Multimegabit Data Service (SMDS)	An RBOC proposed LAN linking service, operating up to 45 Mbps.
Switched Virtual Circuit	A connection between two end points used by a connection-oriented layer-2 technology such as ATM or Frame Relay that can be dynamically switched through the network.
Synchronous Data Link Control (SDLC)	An IBM version of CCITT's HDLC bit-oriented protocol.
Synchronous Optical Network	(SONET) A proposal for a CCITT standard for a backbone transport system based on fiber optic connectivity
Synchronous Transmission	A process where the information and control characters are transmitted at even intervals in order to preserve continuity (synchronization) within a data communications system (also called Bi-sync or Binary Synchronous).

Synchronous Transfer Mode (STM)	B-ISDN communications method that transmits a group of different data streams synchronized to a single reference clock. All data receives the same amount of bandwidth. STM is the standard method carriers use to assign time slots or channels within a T1/E1 leased line.
Synchronous Transfer Module (STM-n)	Basic unit of SDH (Synchronous Digital Hierarchy), defined in increments of 155.52 Mbit/s, with n representing multiples of that rate. An AT&T term for a digital carrier facility used to transmit a DS-1C formatted digital signal at 3.152 Mbps.

T

T-1	An AT&T term for a digital carrier facility used to transmit a DS-2 formatted digital signal at 6.312 Mbps.
T-2	An AT&T term for a digital carrier facility used to transmit a DS-2 formatted digital signal at 6.312 Mbps.
T-3	A digital carrier facility used to transmit a DS-3 formatted digital carrier signal at 44 Mbps; the equivalent of 672 voice channels
T-Carrier	A time division multiplexed digital carrier systems hierarchy (1.544 Mbps and higher) developed by AT&T to carry speech and other signals in digital form.
T-Span	A telephone circuit or cable through which a T carrier runs.
Tag Edge Routers	Devices at the edge of the network that perform packet tagging in a Tag Switching Network.
Tag Switching Routers	Devices in the core of a Tag Switching Network that switches tags assigned by Tag Edge Routers.
Tag Switching	Tag Switching is the label switching approached developed by Cisco Systems that has been submitted to the IETF for publication.
Tail Circuit	The leased or privately owned communication line linking the end of a major transmission link, such as microwave or satellite link or LAN, to the end user location.
Tariff	The list of rates and conditions for particular services offered and supplied by a telephone company.
Technical and Office Protocol Specification	(TOP) A specification of communications networking requirements for general factory, office, and engineering environments developed under the leadership of GM and Boeing and based on international standards.
Telecom. Act of 1996	U.S. legislation that increased competition among intrastate and interstate communication companies and deregulated the cable television industry.
Telephony	A system of voice telecommunications

Telnet	A TCP/IP protocol that allows entry from a keyboard to be passed from a local system to a remote system. Through this protocol, an application on the remote node believes it is communicating with a locally attached device.
Trivial File Transfer Protocol (TFTP)	A simplified version of the File Transfer Protocol that transfers use of total available transponder power and bandwidth, with each station in sequence transmitting in short bursts. Commonly used by devices to download/load code
Time Division Multiple Access (TDMA)	A satellite transmission technique in which several earth stations have use of total available transponder power and bandwidth, with each station in sequence transmitting in short bursts. A transmission technique that divides one communications circuit into multiple channels for simultaneous data transmission by assigning different time slots of the entire bandwidth to individual channel inputs (on a bit or byte level).
Token Bus	A local area network access mechanism and topology in which all stations actively attacked to the bus listen for a broadcast token
Token Ring	standardized as IEEE 802.5A, LAN access mechanism and topology in which a supervisory frame or token is passed from station to adjacent station sequentially. Stations wishing to gain access to the network must wait for the token to arrive before transmitting data. In a token ring, the next logical station receiving the token is also the next physical station on the ring.
TOS	IP Type of Service
Traffic Policing	Mechanism whereby any traffic that violates the traffic contract agreed to at connection setup is detected and discarded. A method to verify that the incoming VP/VC complies with the user's service contract.
Traffic Shaping	A method for smoothing the bursty traffic rate that might arrive on an access virtual circuit so as to present a more uniform traffic rate on the network and comply with the traffic contract.
Transparent LAN Service	Carrier service to interconnect LANs at LAN (Mb) speeds, to extend company/organization LANs with a city or regional area.
Transponder	In satellite communication, a transponder receives the transmission from the earth (uplink), amplifies the signal, changes frequency, and retransmits the data to a receiving earth station (downlink).
Transport Control Protocol/ Internet Protocol	(TCP/IP)The transport-level communication protocol currently in standard use by the DOD.
Trunk Line	A communications line connecting two switches to each other.
Trunking	Multiple VLANs sharing a common transport.

U

UDP	User Datagram Protocol of TCP/IP Protocol Suite
Unbalanced Line	A transmission line in which the magnitudes of the voltages on the two conductors are not equal with respect to ground (i.e., coaxial cable).
Unicast	Equivalent to point-to-point transmission, data directed at a single address. Unicast frame is a frame which is addressed to a single recipient — as opposed to a broadcast or multicast frame
User Network Interface (UNI)	The protocol adopted by the ATM Forum to define connections between ATM user (end-station) and ATM network (switch). UNI version 3.0, published in 1993, specifies the complete range of ATM traffic characteristics, including cell structure, addressing, signaling, adaptation layers, and traffic management.

V

Virtual Circuit/Connection	In packet switching, network facilities that give the appearance to the used of an actual end-to-end circuit where actually, sequential user data packets may be routed differently during the course of the "virtual connection", enabling transmission facilities to be shared by many users simultaneously.
VoIP (Voice over IP)	Set of facilities for managing the delivery of voice information using the Internet Protocol (IP). Voice information is sent in digital form in discrete packets over the Internet instead of in analog form over the public switched telephone network (PSTN). A major advantage of VoIP is that it avoids the tolls charged by ordinary telephone service.
Virtual Path Identifier/. Virtual Channel Identifier	VPI/VCI are fields in the ATM header used to identify the virtual circuit to which a cell belongs.
Virtual Private Network.	In a VPN, resources (such as bandwidth and buffer space) are provided, on-demand, to the users (usually by the public carriers) in such a way that the users view a certain partition of that network as a private network. The advantage of the VPNs, over the dedicated private networks, is lower cost and dynamic use of network resources.
VT100/VT220	A designation for an asynchronous DEC terminal. VT100 is the most common Telnet interface.

W

Wave Division Multiplexing (WDM)	Wave Division Multiplexing (WDM)is an Optical transmission technique in which two or more wavelengths (each carrying its own information) are combined for transmission over a single optical fiber. At the receiving end, the wavelengths are separated and directed to separate receivers. Increases the capacity of

	data transmission over fiber optics. Also used to connect two fiber optic devices over a single strand of fiber.
Wired Equivalent Privacy (WEP)	The optional cryptographic confidentiality algorithm specified by 802.11 used to provide data confidentiality which is subjectively equivalent to the confidentiality of a wired LAN medium that does not employ cryptographic techniques to enhance privacy
Wide Area Network (WAN)	A data communications network designed to serve an area of hundreds of thousands of miles, Public and private packet switching networks and the nationwide telephone network are good examples of wide area networks.
Wireless Transmission	Use either light beams, radio waves, or carrier-connect radio to transmit data. Advantages: no wires; Disadvantages: possibility of interference, slow.
Worldwide WEB (WWW)	Use of sophisticated Internet Browswers using graphic Hypertext to access/utilize web resources (servers) on the Internet.

X

X.25	The standard interface for packet-switched data-communications networks, as designated by the Consultative Committee for International Telephony and Telegraphy (CCITT).
X.75	A communications protocol defined by the ITU-TSS for interconnecting two X.25 networks.
X.400	A communications standard defined by the ITU-TSS for a store -and-forward messaging system.
Xerox Network Systems (XNS)	A Xerox protocol using Ethernet networks. XNS derivatives are still in use today, although XNS is often replaced with TCP/IP.
X-on/X-off (Transmitter on/ Transmitter Off)	A commonly used peripheral device flow-control protocol, used extensively for modem control by an attached terminal or processor.
X-Series Recommendations	The CCITT series of recommendations related to data transmission over public data networks.

Z

ZigBee	ZigBee is a spec for a suite of protocols using small, low-power digital radios. Applications include wireless light switches, electrical meters and industrial equipment that requires short-range wireless data transfer of data at relatively low rates. IEEE Standard 802.15.4