



# Preface

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Computer networks have become a vital tool in the daily operations of businesses around the world. For example, employees in an accounting department can use a common database to access and share customer account information using DECnet. Using an AppleTalk network, Macintosh users in a marketing department can share product bulletins, data sheets, and slide presentations. In an engineering department, Sun workstation users can share product specifications using TCP/IP over Ethernet. And in a company's manufacturing department, IBM devices attached to a Token Ring network can process real-time data about material availability and fill orders sent over links from remote offices.

This glossary assembles and defines the terms and acronyms used in the internetworking industry. Many of the definitions have yet to be standardized, and many terms have several meanings. Multiple definitions and acronym expressions are included where they apply.

The first part of this guide contains terms and acronyms that are commonly used in the internetworking industry. The second part of this guide lists terms and acronyms that are specific to Cisco Systems and Cisco IOS.

This guide also appears on the Cisco documentation CD-ROM.

While many product names and descriptions are included in this glossary, you are encouraged to get more specific information from the appropriate vendor. For information about Cisco products, refer to the *Cisco Product Catalog*.

We hope that this glossary adds to your understanding of internetworking technologies and specific Cisco terms. Suggestions for new terms or acronyms and their associated definitions can be submitted by sending an e-mail to [cs-rep@cisco.com](mailto:cs-rep@cisco.com).



# Numerics

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## **10Base2**

10-Mbps baseband Ethernet specification using 50-ohm thin coaxial cable. 10Base2, which is part of the IEEE 802.3 specification, has a distance limit of 606.8 feet (185 meters) per segment. See also *Cheapernet*, *Ethernet*, *IEEE 802.3*, and *Thinnet*.

## **10Base5**

10-Mbps baseband Ethernet specification using standard (thick) 50-ohm baseband coaxial cable. 10Base5, which is part of the IEEE 802.3 baseband physical layer specification, has a distance limit of 1640 feet (500 meters) per segment. See also *Ethernet* and *IEEE 802.3*.

## **10BaseF**

10-Mbps baseband Ethernet specification that refers to the 10BaseFB, 10BaseFL, and 10BaseFP standards for Ethernet over fiber-optic cabling. See also *10BaseFB*, *10BaseFL*, *10BaseFP*, and *Ethernet*.

## **10BaseFB**

10-Mbps baseband Ethernet specification using fiber-optic cabling. 10BaseFB is part of the IEEE 10BaseF specification. It is not used to connect user stations, but instead provides a synchronous signaling backbone that allows additional segments and repeaters to be connected to the network. 10BaseFB segments can be up to 1.24 miles (2000 meters) long. See also *10BaseF* and *Ethernet*.

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**10BaseFL**

10-Mbps baseband Ethernet specification using fiber-optic cabling. 10BaseFL is part of the IEEE 10BaseF specification and, while able to interoperate with FOIRL, is designed to replace the FOIRL specification. 10BaseFL segments can be up to 3280 feet (1000 meters) long if used with FOIRL, and up to 1.24 miles (2000 meters) if 10BaseFL is used exclusively. See also *10BaseF*, *Ethernet*, and *FOIRL*.

**10BaseFP**

10-Mbps fiber-passive baseband Ethernet specification using fiber-optic cabling. 10BaseFP is part of the IEEE 10BaseF specification. It organizes a number of computers into a star topology without the use of repeaters. 10BaseFP segments can be up to 1640 feet (500 meters) long. See also *10BaseF* and *Ethernet*.

**10BaseT**

10-Mbps baseband Ethernet specification using two pairs of twisted-pair cabling (Category 3, 4, or 5): one pair for transmitting data and the other for receiving data. 10BaseT, which is part of the IEEE 802.3 specification, has a distance limit of approximately 328 feet (100 meters) per segment. See also *Ethernet* and *IEEE 802.3*.

**10Broad36**

10-Mbps broadband Ethernet specification using broadband coaxial cable. 10Broad36, which is part of the IEEE 802.3 specification, has a distance limit of 2.24 miles (3600 meters) per segment. See also *Ethernet* and *IEEE 802.3*.

**100BaseFX**

100-Mbps baseband Fast Ethernet specification using two strands of multimode fiber-optic cable per link. To guarantee proper signal timing, a 100BaseFX link cannot exceed 1312 feet (400 meters) in length. Based on the IEEE 802.3 standard. See also *100BaseX*, *Fast Ethernet*, and *IEEE 802.3*.

**100BaseT**

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

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**100BaseT4**

100-Mbps baseband Fast Ethernet specification using four pairs of Category 3, 4, or 5 UTP wiring. To guarantee proper signal timing, a 100BaseT4 segment cannot exceed 328 feet (100 meters) in length. Based on the IEEE 802.3 standard. See also *Fast Ethernet* and *IEEE 802.3*.

**100BaseTX**

100-Mbps baseband Fast Ethernet specification using two pairs of either UTP or STP wiring. The first pair of wires is used to receive data; the second is used to transmit. To guarantee proper signal timing, a 100BaseTX segment cannot exceed 328 feet (100 meters) in length. Based on the IEEE 802.3 standard. See also *100BaseX*, *Fast Ethernet*, and *IEEE 802.3*.

**100BaseX**

100-Mbps baseband Fast Ethernet specification that refers to the 100BaseFX and 100BaseTX standards for Fast Ethernet over fiber-optic cabling. Based on the IEEE 802.3 standard. See also *100BaseFX*, *100BaseTX*, *Fast Ethernet*, and *IEEE 802.3*.

**100VG-AnyLAN**

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

**1822**

Historic term that refers to the original ARPANET host-to-IMP interface. The specifications are in BBN report 1822. See *host* and *IMP*.

**24th channel signaling**

See *24th channel signaling*.

**2B1Q**

2 binary 1 quaternary. Encoding scheme that provides a 2 bits per baud, 80-kbaud per second, 160-kbps transfer rate. The most common signaling method on ISDN U interfaces. This protocol is defined in detail in 1988 ANSI spec T1.601.

**370 block mux channel**

See *block multiplexer channel*.

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**4B/5B local fiber**

4-byte/5-byte local fiber. Fiber channel physical media used for FDDI and ATM. Supports speeds of up to 100 Mbps over multimode fiber. See also *TAXI 4B/5B*.

**4-byte/5-byte local fiber**

See *4B/5B local fiber*.

**6BONE**

The internet's experimental IPv6 network.

**8-byte/10-byte local fiber**

See *8B/10B local fiber*.

**802.x**

Set of IEEE standards for the definition of LAN protocols.

**822**

Short form of RFC 822. Refers to the format of Internet style e-mail as defined in RFC 822.

**8B/10B local fiber**

8-byte/10-byte local fiber. Fiber channel physical media that supports speeds up to 149.76 Mbps over multimode fiber.

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**A&B bit signaling**

Procedure used in T1 transmission facilities in which each of the 24 T1 subchannels devotes 1 bit of every sixth frame to the carrying of supervisory signaling information. Also called 24th channel signaling.

**AAA**

authentication, authorization, and accounting. Pronounced "triple a."

**AAL**

ATM adaptation layer. Service-dependent sublayer of the data link layer. The AAL accepts data from different applications and presents it to the ATM layer in the form of 48-byte ATM payload segments. AALs consist of two sublayers: CS and SAR. AALs differ on the basis of the source-destination timing used, whether they use CBR or VBR, and whether they are used for connection-oriented or connectionless mode data transfer. At present, the four types of AAL recommended by the ITU-T are AAL1, AAL2, AAL3/4, and AAL5. See also *AAL1*, *AAL2*, *AAL3/4*, *AAL5*, *ATM*, *ATM layer*, *CS*, and *SAR*.

**AAL1**

ATM adaptation layer. One of four AALs recommended by the ITU-T. AAL1 is used for connection-oriented, delay-sensitive services requiring constant bit rates, such as uncompressed video and other isochronous traffic. See also *AAL*.

**AAL2**

ATM adaptation layer 2. One of four AALs recommended by the ITU-T. AAL2 is used for connection-oriented services that support a variable bit rate, such as some isochronous video and voice traffic. See also *AAL*.

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**AAL3/4**

ATM adaptation layer 3/4. One of four AALs (merged from two initially distinct adaptation layers) recommended by the ITU-T. AAL3/4 supports both connectionless and connection-oriented links, but is primarily used for the transmission of SMDS packets over ATM networks. See also *AAL*.

**AAL5**

ATM adaptation layer 5. One of four AALs recommended by the ITU-T. AAL5 supports connection-oriented VBR services and is used predominantly for the transfer of classical IP over ATM and LANE traffic. AAL5 uses SEAL and is the least complex of the current AAL recommendations. It offers low bandwidth overhead and simpler processing requirements in exchange for reduced bandwidth capacity and error-recovery capability. See also *AAL* and *SEAL*.

**AARP**

AppleTalk Address Resolution Protocol. Protocol in the AppleTalk protocol stack that maps a data-link address to a network address.

**AARP probe packets**

Packets transmitted by AARP that determine if a randomly selected node ID is being used by another node in a nonextended AppleTalk network. If the node ID is not being used, the sending node uses that node ID. If the node ID is being used, the sending node chooses a different ID and sends more AARP probe packets. See also *AARP*.

**ABCD signaling**

4-bit telephony line signaling coding in which each letter represents 1 of the 4 bits. This is often associated with CAS or robbed-bit signaling on a T1 or E1 telephony trunk.

**ABM**

Asynchronous Balanced Mode. HDLC (and derivative protocol) communication mode supporting peer-oriented, point-to-point communications between two stations, where either station can initiate transmission.

**ABR**

1. available bit rate. QoS class defined by the ATM Forum for ATM networks. ABR is used for connections that do not require timing relationships between source and destination. ABR provides no guarantees in terms of cell loss or delay, providing only best-effort service. Traffic sources adjust their transmission rate in response to



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information they receive describing the status of the network and its capability to successfully deliver data. Compare with *CBR*, *UBR*, and *VBR*.

2. area border router. Router located on the border of one or more OSPF areas that connects those areas to the backbone network. ABRs are considered members of both the OSPF backbone and the attached areas. They therefore maintain routing tables describing both the backbone topology and the topology of the other areas.

**Abstract Syntax Notation One**

See *ASN.1*.

**access device**

Hardware component used in your signaling controller system: access server or mux.

**access list**

List kept by routers to control access to or from the router for a number of services (for example, to prevent packets with a certain IP address from leaving a particular interface on the router).

**access method**

1. Generally, the way in which network devices access the network medium.
2. Software within an SNA processor that controls the flow of information through a network.

**access server**

Communications processor that connects asynchronous devices to a LAN or WAN through network and terminal emulation software. Performs both synchronous and asynchronous routing of supported protocols. Sometimes called a network access server. See also *communication server*.

**access unit**

See *AU*.

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**accounting management**

One of five categories of network management defined by ISO for management of OSI networks. Accounting management subsystems are responsible for collecting network data relating to resource usage. See also *configuration management*, *fault management*, *performance management*, and *security management*.

**ACD**

automatic call distribution. Device or service that automatically reroutes calls to customers in geographically distributed locations served by the same CO. See also *CO*.

**ACELP**

algebraic code excited linear prediction.

**ACF**

Advanced Communications Function. A group of SNA products that provides distributed processing and resource sharing. See also *ACF/NCP*.

**ACF/NCP**

Advanced Communications Function/Network Control Program. The primary SNA NCP. ACF/NCP resides in the communications controller and interfaces with the SNA access method in the host processor to control network communications. See also *ACF* and *NCP*.

**ACK**

See *acknowledgment*.

**acknowledgment**

Notification sent from one network device to another to acknowledge that some event (for example, receipt of a message) occurred. Sometimes abbreviated ACK. Compare to *NAK*.

**ACOM**

Term used in G.165, "General Characteristics of International Telephone Connections and International Telephone Circuits: Echo Cancellers." ACOM is the combined loss achieved by the echo canceller, which is the sum of the echo return loss, echo return loss enhancement, and nonlinear processing loss for the call.

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**ACR**

allowed cell rate. Parameter defined by the ATM Forum for ATM traffic management. ACR varies between the MCR and the PCR, and is dynamically controlled using congestion control mechanisms. See also *MCR* and *PCR*.

**ACSE**

association control service element. OSI convention used to establish, maintain, or terminate a connection between two applications.

**active hub**

Multiported device that amplifies LAN transmission signals.

**active monitor**

Device responsible for managing a Token Ring. A network node is selected to be the active monitor if it has the highest MAC address on the ring. The active monitor is responsible for such management tasks as ensuring that tokens are not lost, or that frames do not circulate indefinitely. See also *ring monitor* and *standby monitor*.

**ActiveX**

Microsoft's Windows-specific non-Java technique for writing applets. ActiveX applets take considerably longer to download than the equivalent Java applets; however, they more fully exploit the features of Windows 95. ActiveX is sometimes said to be a superset of Java. See also *applet*, *Java*.

**AD**

administrative domain. Group of hosts, routers, and networks operated and managed by a single organization.

**adapter**

See *NIC*.

**adaptive differential pulse code modulation**

See *ADPCM*.

**adaptive routing**

See *dynamic routing*.

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**ADCCP**

Advanced Data Communications Control Protocol. ANSI standard bit-oriented data link control protocol.

**address**

Data structure or logical convention used to identify a unique entity, such as a particular process or network device.

**addressed call mode**

Mode that permits control signals and commands to establish and terminate calls in *V.25bis*. See also *V.25bis*.

**address mapping**

Technique that allows different protocols to interoperate by translating addresses from one format to another. For example, when routing IP over X.25, the IP addresses must be mapped to the X.25 addresses so that the IP packets can be transmitted by the X.25 network. See also *address resolution*.

**address mask**

Bit combination used to describe which portion of an address refers to the network or subnet and which part refers to the host. Sometimes referred to simply as mask. See also *subnet mask*.

**address resolution**

Generally, a method for resolving differences between computer addressing schemes. Address resolution usually specifies a method for mapping network layer (Layer 3) addresses to data link layer (Layer 2) addresses. See also *address mapping*.

**Address Resolution Protocol**

See *ARP*.

**address translation gateway**

See *ATG* (address translation gateway) in the “Cisco Systems Terms and Acronyms” section.

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**adjacency**

Relationship formed between selected neighboring routers and end nodes for the purpose of exchanging routing information. Adjacency is based upon the use of a common media segment.

**adjacent nodes**

1. In SNA, nodes that are connected to a given node with no intervening nodes.
2. In DECnet and OSI, nodes that share a common network segment (in Ethernet, FDDI, or Token Ring networks).

**ADM**

Add Drop Multiplexer. In OSS, a multiplexer that allows a signal to be added into or dropped out of a SONET span. See also *SONET*.

**ADMD**

Administration Management Domain. X.400 Message Handling System public carrier. The ADMDs in all countries worldwide together provide the X.400 backbone. See also *PRMD*.

**administrative distance**

Rating of the trustworthiness of a routing information source. Administrative distance is often expressed as a numerical value between 0 and 255. The higher the value, the lower the trustworthiness rating.

**Administrative Domain**

See *AD*.

**administrative weight**

See *AW* and *PTSP*.

**admission control**

See *traffic policing*.

**ADPCM**

adaptive differential pulse code modulation. Process by which analog voice samples are encoded into high-quality digital signals.

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**ADSL**

asymmetric digital subscriber line. One of four DSL technologies. ADSL is designed to deliver more bandwidth downstream (from the central office to the customer site) than upstream. Downstream rates range from 1.5 to 9 Mbps, while upstream bandwidth ranges from 16 to 640 kbps. ADSL transmissions work at distances up to 18,000 feet (5,488 meters) over a single copper twisted pair. See also *HDSL*, *SDSL*, and *VDSL*.

**ADSU**

ATM DSU. Terminal adapter used to access an ATM network via an HSSI-compatible device. See also *DSU*.

**Advanced Communications Function**

See *ACF*.

**Advanced Communications Function/Network Control Program**

See *ACF/NCP*.

**Advanced CoS Management**

advanced class-of-service management. Essential for delivering the required QoS to all applications. Cisco switches contain per-VC queuing, per-VC rate scheduling, multiple CoS queuing, and egress queuing. This enables network managers to refine connections to meet specific application needs. Formerly called FairShare and OptiClass.

**Advanced Data Communications Control Protocol**

See *ADCCP*.

**Advanced Intelligent Network**

See *AIN*.

**Advanced Peer-to-Peer Networking**

See *APPN*.

**Advanced Program-to-Program Communication**

See *APPC*.

**Advanced Research Projects Agency**

See *ARPA*.

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**Advanced Research Projects Agency Network**

See *ARPANET*.

**advertising**

Router process in which routing or service updates are sent at specified intervals so that other routers on the network can maintain lists of usable routes.

**AEP**

AppleTalk Echo Protocol. Used to test connectivity between two AppleTalk nodes. One node sends a packet to another node and receives a duplicate, or echo, of that packet.

**AFI**

authority and format identifier. Portion of an NSAP-format ATM address that identifies the type and format of the IDI portion of an ATM address. See also *IDI* and *NSAP*.

**AFP**

AppleTalk Filing Protocol. Presentation-layer protocol that allows users to share data files and application programs that reside on a file server. AFP supports AppleShare and Mac OS File Sharing.

**agent**

1. Generally, software that processes queries and returns replies on behalf of an application.
2. In NMSs, process that resides in all managed devices and reports the values of specified variables to management stations.

**AIN**

Advanced Intelligent Network. In SS7, an expanded set of network services made available to the user, and under user control, that requires improvement in network switch architecture, signaling capabilities, and peripherals. See also *SS7*.

**AIO**

Asynchronous input/output.

**AIP**

See *AIP* (ATM Interface Processor) in the “Cisco Systems Terms and Acronyms” section.

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**AIS**

alarm indication signal. In a T1 transmission, an all-ones signal transmitted in lieu of the normal signal to maintain transmission continuity and to indicate to the receiving terminal that there is a transmission fault that is located either at, or upstream from, the transmitting terminal. See also *TI*.

**alarm**

SNMP message notifying an operator or administrator of a network problem. See also *event* and *trap*.

**alarm indication signal**

See *AIS*.

**a-law**

ITU-T companding standard used in the conversion between analog and digital signals in PCM systems. A-law is used primarily in European telephone networks and is similar to the North American mu-law standard. See also *companding* and *mu-law*.

**algorithm**

Well-defined rule or process for arriving at a solution to a problem. In networking, algorithms are commonly used to determine the best route for traffic from a particular source to a particular destination.

**alias**

See *entity*.

**alignment error**

In IEEE 802.3 networks, an error that occurs when the total number of bits of a received frame is not divisible by eight. Alignment errors are usually caused by frame damage due to collisions.

**A-link**

SS7 access link. Dedicated SS7 signaling link not physically associated with any particular link carrying traffic.

**allowed cell rate**

See *ACOM*.



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**all-rings explorer packet**

See *all-routes explorer packet*.

**all-routes explorer packet**

Explorer packet that traverses an entire SRB network, following all possible paths to a specific destination. Sometimes called all-rings explorer packet. See also *explorer packet*, *local explorer packet*, and *spanning explorer packet*.

**ALO transaction**

ATP transaction in which the request is repeated until a response is received by the requester or until a maximum retry count is reached. This recovery mechanism ensures that the transaction request is executed at least once. See also *ATP*.

**alternate mark inversion**

See *AMI*.

**AM**

amplitude modulation. Modulation technique whereby information is conveyed through the amplitude of the carrier signal. Compare with *FM* and *PAM*. See also *modulation*.

**AMA**

Automatic Messaging Accounting. In OSS, the automatic collection, recording, and processing of information relating to calls for billing purposes.

**AMADNS**

AMA Data Networking System. In OSS, the next generation (formerly Bellcore) system for the collection and transport of AMA data from central office switches to a billing system. See also *AMA*.

**AMATPS**

AMA Teleprocessing System. In OSS, the Bellcore legacy system for collecting and transporting AMA data from central office switches to a billing system. The AMATPS consists of an AMA transmitter and a collector. See also *AMA*.

**American National Standards Institute**

See *ANP*.

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**American Standard Code for Information Interchange**

See *ASCII*.

**AMI**

alternate mark inversion. Line-code type used on T1 and E1 circuits. In AMI, zeros are represented by 01 during each bit cell, and ones are represented by 11 or 00, alternately, during each bit cell. AMI requires that the sending device maintain ones density. Ones density is not maintained independently of the data stream. Sometimes called binary coded alternate mark inversion. Compare with *B8ZS*. See also *ones density*.

**amplitude**

Maximum value of an analog or a digital waveform.

**amplitude modulation**

See *AM*.

**analog transmission**

Signal transmission over wires or through the air in which information is conveyed through the variation of some combination of signal amplitude, frequency, and phase.

**ANI**

automatic number identification. SS7 (signaling system 7) feature in which a series of digits, either analog or digital, are included in the call, identifying the telephone number of the calling device. In other words, ANI identifies the number of the calling party.

**anonymous FTP**

Allows a user to retrieve documents, files, programs, and other archived data from anywhere on the Internet without having to establish a userid and password. By using the special userid of anonymous, the network user will bypass local security checks and will have access to publicly accessible files on the remote system. See *FTP*.

**ANP**

automatic numbering plan.

**ANSI**

American National Standards Institute. Voluntary organization composed of corporate, government, and other members that coordinates standards-related activities, approves U.S. national standards, and develops positions for the United States in international

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standards organizations. ANSI helps develop international and U.S. standards relating to, among other things, communications and networking. ANSI is a member of the IEC and the ISO. See also *IEC* and *ISO*.

**ANSI X3T9.5**

See *X3T9.5*.

**anycast**

In ATM, an address that can be shared by multiple end systems. An anycast address can be used to route a request to a node that provides a particular service.

**AOW**

Asia and Oceania Workshop. One of the three regional OSI Implementors Workshops. See also *EWOS*.

**APaRT**

See *APaRT* (Automated Packet Recognition/Translation) in the “Cisco Systems Terms and Acronyms” section.

**APC**

adjacent point code. The point code of the next hop in the system for the bearer channels; usually it is the STP (signal transfer point).

**API**

Application Programming Interface. Specification of function-call conventions that defines an interface to a service.

**APNIC**

Asia Pacific Network Information Center. Nonprofit Internet registry organization for the Asia Pacific region. The other Internet registries are currently IANA, RIPE NCC and InterNIC.

**Apollo Domain**

Proprietary network protocol suite developed by Apollo Computer for communication on proprietary Apollo networks.

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**APPC**

Advanced Program-to-Program Communication. IBM SNA system software that allows high-speed communication between programs on different computers in a distributed computing environment. APPC establishes and tears down connections between communicating programs. It consists of two interfaces: programming and data-exchange. The programming interface replies to requests from programs requiring communication; the data-exchange interface establishes sessions between programs. APPC runs on LU 6.2 devices. See also *LU 6.2*.

**applet**

Small program, often used in the context of a Java-based program, that is compiled and embedded in an HTML page. See *ActiveX* and *Java*.

**AppleTalk**

Series of communications protocols designed by Apple Computer consisting of two phases. Phase 1, the earlier version, supports a single physical network that can have only one network number and be in one zone. Phase 2, supports multiple logical networks on a single physical network and allows networks to be in more than one zone. See also *zone*.

**AppleTalk Address Resolution Protocol**

See *AARP*.

**AppleTalk Filing Protocol**

See *AFP*.

**AppleTalk Echo Protocol**

See *AEP*.

**AppleTalk Remote Access**

See *ARA*.

**AppleTalk Session Protocol**

See *ASP*.

**AppleTalk Transaction Protocol**

See *ATP*.

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**AppleTalk Update-Based Routing Protocol**

See *AURP*.

**AppleTalk zone**

See *zone*.

**application**

Program that performs a function directly for a user. FTP and Telnet clients are examples of network applications.

**application layer**

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

**application programming interface**

See *API*.

**APPN**

Advanced Peer-to-Peer Networking. Enhancement to the original IBM SNA architecture. APPN handles session establishment between peer nodes, dynamic transparent route calculation, and traffic prioritization for APPC traffic. Compare with *APPN+*. See also *APPC*.

**APPN+**

Next-generation APPN that replaces the label-swapping routing algorithm with source routing. Also called high-performance routing. See also *APPN*.

**APS**

automatic protection switching. SONET switching mechanism that routes traffic from working lines to protect them in case of a line card failure or fiber cut.

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**ARA**

AppleTalk Remote Access. Protocol that provides Macintosh users direct access to information and resources at a remote AppleTalk site.

**Archie**

System that provides lists of anonymous FTP archives. See *Gopher*, *WAIS*, and *World Wide Web*.

**ARCnet**

Attached Resource Computer Network. 2.5-Mbps token-bus LAN developed in the late 1970s and early 1980s by Datapoint Corporation.

**area**

Logical set of network segments (CLNS-, DECnet-, or OSPF-based) and their attached devices. Areas are usually connected to other areas via routers, making up a single autonomous system. See also *autonomous system*.

**area border router**

See *ABR*.

**ARIN**

American Registry for Internet Numbers. Nonprofit organization established for the purpose of administrating and registrating IP numbers to the geographical areas currently managed by Network Solutions (InterNIC). Those areas include, but are not limited to, North America, South America, South Africa, and the Caribbean.

**ARM**

asynchronous response mode. HDLC communication mode involving one primary station and at least one secondary station, where either the primary or one of the secondary stations can initiate transmissions. See also *primary station* and *secondary station*.

**ARP**

Address Resolution Protocol. Internet protocol used to map an IP address to a MAC address. Defined in RFC 826. Compare with *RARP*. See also *proxy ARP*.

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**ARPA**

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

**ARPANET**

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

**ARQ**

automatic repeat request. Communication technique in which the receiving device detects errors and requests retransmissions.

**ARU**

alarm relay unit.

**AS**

See *autonomous system*.

**ASAM**

ATM subscriber access multiplexer. A telephone central office multiplexer that supports SDL ports over a wide range of network interfaces. An ASAM sends and receives subscriber data (often Internet services) over existing copper telephone lines, concentrating all traffic onto a single high-speed trunk for transport to the Internet or the enterprise intranet. This device is similar to a DSLAM (different manufacturers use different terms for similar devices).

**ASBR**

autonomous system boundary router. ABR located between an OSPF autonomous system and a non-OSPF network. ASBRs run both OSPF and another routing protocol, such as RIP. ASBRs must reside in a nonstub OSPF area. See also *ABR*, *non-stub area*, and *OSPF*.

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**ASCII**

American Standard Code for Information Interchange. 8-bit code for character representation (7 bits plus parity).

**ASCU**

agent-set control unit.

**ASI**

ATM Service Interface.

**ASN**

auxiliary signal network.

**ASN.1**

Abstract Syntax Notation One. OSI language for describing data types independent of particular computer structures and representation techniques. Described by ISO International Standard 8824. See also *BER*, basic encoding rules.

**ASP**

1. AppleTalk Session Protocol. Protocol that uses *ATP* to provide session establishment, maintenance, and teardown, as well as request sequencing. See also *ATP*.
2. Telecommunications: Auxiliary signal path. Link between *TransPaths* that allows them to exchange signaling information that is incompatible with the PSTN backbone network; used to provide feature transparency.

**assigned numbers**

RFC [STD2] documents the currently assigned values from several series of numbers used in network protocol implementations. This RFC is updated periodically, and current information can be obtained from the IANA. If you are developing a protocol or application that will require the use of a link, socket, port, protocol, and so forth, contact the IANA to receive a number assignment. See *IANA* and *STD*.

**association control service element**

See *ACSE*.



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**associative memory**

Memory that is accessed based on its contents, not on its memory address. Sometimes called content addressable memory (CAM).

**AST**

automatic spanning tree. Function that supports the automatic resolution of spanning trees in SRB networks, providing a single path for spanning explorer frames to traverse from a given node in the network to another. AST is based on the IEEE 802.1 standard. See *IEEE 802.1* and *SRB*.

**ASTA**

Advanced Software Technology and Algorithms. Component of the HPCC program intended to develop software and algorithms for implementation on high-performance computer and communications systems. See also *HPCC*.

**async**

Subset of tty.

**Asynchronous Balanced Mode**

See *ABM*.

**asynchronous response mode**

See *ARM*.

**asynchronous time-division multiplexing**

See *ATDM*.

**Asynchronous Transfer Mode**

See *ATM*.

**asynchronous transmission**

Term describing digital signals that are transmitted without precise clocking. Such signals generally have different frequencies and phase relationships. Asynchronous transmissions usually encapsulate individual characters in control bits (called start and stop bits) that designate the beginning and end of each character. Compare with *isochronous transmission*, *plesiochronous transmission*, and *synchronous transmission*.

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**ATCP**

AppleTalk Control Protocol. Protocol that establishes and configures AppleTalk over PPP, as defined in RFC 1378. See also *PPP*.

**ATDM**

asynchronous time-division multiplexing. Method of sending information that resembles normal TDM, except that time slots are allocated as needed rather than preassigned to specific transmitters. Compare with *FDM*, *statistical multiplexing*, and *TDM*.

**ATG**

See *ATG* (address translation gateway) in the “Cisco Systems Terms and Acronyms” section.

**ATH**

attention hangup.

**at-least-once transaction**

See *ALO transaction*.

**ATM**

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

**ATM adaptation layer**

See *AAL*.

**ATM adaptation layer 1**

See *AAL1*.

**ATM adaptation layer 2**

See *AAL2*.

**ATM adaptation layer 3/4**

See *AAL3/4*.

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**ATM adaptation layer 5**

See *AAL5*.

**ATM ARP server**

Device that provides address-resolution services to LISs when running classical IP over ATM. See also *LIS*.

**ATM data service unit**

See *ADSU*.

**ATM endpoint**

Point in an ATM network where an ATM connection is initiated or terminated. ATM endpoints include ATM-attached workstations, ATM-attached servers, ATM-to-LAN switches, and ATM routers.

**ATM Forum**

International organization jointly founded in 1991 by Cisco Systems, NET/ADAPTIVE, Northern Telecom, and Sprint that develops and promotes standards-based implementation agreements for ATM technology. The ATM Forum expands on official standards developed by ANSI and ITU-T, and develops implementation agreements in advance of official standards.

**ATM interface processor**

See *AIS*.

**ATM layer**

Service-independent sublayer of the data link layer in an ATM network. The ATM layer receives the 48-byte payload segments from the AAL and attaches a 5-byte header to each, producing standard 53-byte ATM cells. These cells are passed to the physical layer for transmission across the physical medium. See also *AAL*.

**ATMM**

ATM management. Process that runs on an ATM switch that controls VCI translation and rate enforcement. See also *ATM* and *VCD*.

**ATM management**

See *ATMM*.

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**ATM network**

See *ATM network* in the “Cisco Systems Terms and Acronyms” section.

**ATM NIC**

See *ATM network interface card* in the “Cisco Systems Terms and Acronyms” section.

**ATM service interface.**

See *ASCU*.

**ATM UNI**

See *UNI*.

**ATM user-user connection**

Connection created by the ATM layer to provide communication between two or more ATM service users, such as ATMM processes. Such communication can be unidirectional, using one VCC, or bidirectional, using two VCCs. See also *ATM layer*, *ATMM*, and *VCC*.

**ATP**

AppleTalk Transaction Protocol. Transport-level protocol that provides a loss-free transaction service between sockets. The service allows exchanges between two socket clients in which one client requests the other to perform a particular task and to report the results. ATP binds the request and response together to ensure the reliable exchange of request-response pairs.

**Attached Resource Computer Network**

See *ARCnet*.

**attachment unit interface**

See *AUI*.

**attenuation**

Loss of communication signal energy.

**attribute**

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 identifier together with one or more values.

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**AU**

access unit. Device that provides ISDN access to PSNs. See also *PSN*.

**AUI**

attachment unit interface. IEEE 802.3 interface between an MAU and a NIC. The term AUI can also refer to the rear panel port to which an AUI cable might attach. Also called transceiver cable. See also *IEEE 802.3*, *MAU*, and *NIC*.

**AUP**

acceptable use policy. Many transit networks have policies that restrict the use to which the network can be put. Enforcement of AUPs varies with the network.

**AURP**

AppleTalk Update-Based Routing Protocol. Method of encapsulating AppleTalk traffic in the header of a foreign protocol, allowing the connection of two or more discontinuous AppleTalk internetworks through a foreign network (such as TCP/IP) to form an AppleTalk WAN. This connection is called an AURP tunnel. In addition to its encapsulation function, AURP maintains routing tables for the entire AppleTalk WAN by exchanging routing information between exterior routers. See also *AURP tunnel* and *exterior router*.

**AURP tunnel**

Connection created in an AURP WAN that functions as a single, virtual data link between AppleTalk internetworks physically separated by a foreign network (a TCP/IP network, for example). See also *AURP*.

**AUSM**

ATM user service module.

**authentication**

In security, the verification of the identity of a person or process.

**authority zone**

Associated with DNS, an authority zone is a section of the domain-name tree for which one name server is the authority. See also *DNS*.

**Automated Packet Recognition/Translation**

See *APaRT* in the “Cisco Systems Terms and Acronyms” section.

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**automatic call distribution**

See *ACD*.

**automatic call reconnect**

Feature permitting automatic call rerouting away from a failed trunk line.

**automatic protection switching**

See *APS*.

**automatic repeat request**

See *ARQ*.

**Automatic Routing Management**

Formerly AutoRoute. Connection-oriented mechanism used in Cisco WAN switches to provide connectivity across the network. Switches perform a connection admission control (CAC) function on all types of connections in the network. Distributed network intelligence enables the CAC function to automatically route and reroute connections over optimal paths, while guaranteeing the required QoS.

**automatic spanning tree**

See *AST*.

**autonomous confederation**

Group of autonomous systems that rely on their own network reachability and routing information more than they rely on that received from other autonomous systems or confederations.

**autonomous switching**

See *autonomous switching* in the “Cisco Systems Terms and Acronyms” section.

**autonomous system**

Collection of networks under a common administration sharing a common routing strategy. Autonomous systems are subdivided by areas. An autonomous system must be assigned a unique 16-bit number by the IANA. Sometimes abbreviated as AS. See also *area* and *IANA*.

**autonomous system boundary router**

See *ASAM*.

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**autoreconfiguration**

Process performed by nodes within the failure domain of a Token Ring network. Nodes automatically perform diagnostics in an attempt to reconfigure the network around the failed areas. See also *failure domain*.

**available bit rate**

See *ABR*.

**average rate**

Average rate, in kilobits per second (kbps), at which a given virtual circuit will transmit

**AVM**

ATM voice multiplexer.

**AW**

administrative weight. Value set by the network administrator to indicate the desirability of a network link. One of four link metrics exchanged by PTSPs to determine the available resources of an ATM network.





## B

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**B8ZS**

binary 8-zero substitution. Line-code type, used on T1 and E1 circuits, in which a special code is substituted whenever 8 consecutive zeros are sent over the link. This code is then interpreted at the remote end of the connection. This technique guarantees ones density independent of the data stream. Sometimes called *bipolar 8-zero substitution*. Compare with *AMI*. See also *ones density*.

**backbone**

Part of a network that acts as the primary path for traffic that is most often sourced from, and destined for, other networks.

**back end**

Node or software program that provides services to a front end. See also *client*, *FRF.11*, and *server*.

**backoff**

The (usually random) retransmission delay enforced by contentious MAC protocols after a network node with data to transmit determines that the physical medium is already in use.

**backplane**

Physical connection between an interface processor or card and the data buses and the power distribution buses inside a chassis.

**back pressure**

Propagation of network congestion information upstream through an internetwork.

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**backward explicit congestion notification**

See *BECN*.

**backward learning**

Algorithmic process used for routing traffic that surmises information by assuming symmetrical network conditions. For example, if node A receives a packet from node B through intermediate node C, the backward-learning routing algorithm will assume that A can optimally reach B through C.

**balanced configuration**

In HDLC, a point-to-point network configuration with two combined stations.

**balanced, unbalanced**

See *balun*.

**balun**

balanced, unbalanced. Device used for matching impedance between a balanced and an unbalanced line, usually twisted-pair and coaxial cable.

**bandwidth**

Difference between the highest and lowest frequencies available for network signals. The term is also used to describe the rated throughput capacity of a given network medium or protocol.

**bandwidth allocation**

See *bandwidth reservation*.

**bandwidth reservation**

Process of assigning bandwidth to users and applications served by a network. Involves assigning priority to different flows of traffic based on how critical and delay-sensitive they are. This makes the best use of available bandwidth, and if the network becomes congested, lower-priority traffic can be dropped. Sometimes called *bandwidth allocation*. See also *call leg*.

**Banyan VINES**

See *VINES*.

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**BARRNet**

Bay Area Regional Research Network. Regional network serving the San Francisco Bay Area. The BARRNet backbone is composed of four University of California campuses (Berkeley, Davis, Santa Cruz, and San Francisco), Stanford University, Lawrence Livermore National Laboratory, and NASA Ames Research Center. BARRNet is now part of BBN Planet. See also *BBN Planet*.

**baseband**

Characteristic of a network technology where only one carrier frequency is used. Ethernet is an example of a baseband network. Also called narrowband. Contrast with *broadband*.

**bash**

Bourne-again shell. Interactive UNIX shell based on the traditional Bourne shell, but with increased functionality. See also *root account*.

**basic encoding rules**

See *BER*.

**Basic Rate Interface**

See *BRI*.

**Basic Research and Human Resources**

See *BRHR*.

**baud**

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

**Bay Area Regional Research Network**

See *BARRNet*.

**BBN**

Bolt, Beranek, and Newman, Inc. High-technology company located in Massachusetts that developed and maintained the ARPANET (and later, the Internet) core gateway system. See also *BBN Planet*.

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**BBN Planet**

Subsidiary company of BBN that operates a nationwide Internet access network composed in part by the former regional networks BARRNet, NEARNET, and SURAnet. See also *BARRNet*, *BBN*, *NEARNET*, and *SURAnet*.

**Bc**

Committed Burst. Negotiated tariff metric in Frame Relay internetworks. The maximum amount of data (in bits) that a Frame Relay internetwork is committed to accept and transmit at the CIR. See also *Be* and *CIR*.

**B channel**

bearer channel. In ISDN, a full-duplex, 64-kbps channel used to send user data. Compare to *D channel*, *E channel*, and *H channel*.

**BCP**

Best Current Practices. The newest subseries of RFCs that are written to describe BCPs in the Internet. Rather than specifying a protocol, these documents specify the best ways to use the protocols and the best ways to configure options to ensure interoperability between various vendors' products.

**BDCS**

Broadband Digital Cross-Connect System. SONET DCS capable of cross-connecting DS-3, STS-1 and STS-3c signals. See also *DCS*.

**Be**

excess burst. Negotiated tariff metric in Frame Relay internetworks. The number of bits that a Frame Relay internetwork will attempt to transmit after Bc is accommodated. Be data is, in general, delivered with a lower probability than Bc data because Be data can be marked as DE by the network. See also *Bc* and *DE*.

**beacon**

Frame from a Token Ring or FDDI device indicating a serious problem with the ring, such as a broken cable. A beacon frame contains the address of the station assumed to be down. See also *failure domain*.

**bearer channel**

See *B channel*.

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**Because It's Time Network**

See *BITNET*.

**BECN**

backward explicit congestion notification. Bit set by a Frame Relay network in frames traveling in the opposite direction of frames encountering a congested path. DTE receiving frames with the BECN bit set can request that higher-level protocols take flow control action as appropriate. Compare with *FE*.

**Bell Communications Research**

See *Bellcore*.

**Bellcore**

Bell Communications Research. Organization that performs research and development on behalf of the RBOCs.

**Bellman-Ford routing algorithm**

See *distance vector routing algorithm*.

**Bell operating company**

See *BOC*.

**BER**

1. bit error rate. Ratio of received bits that contain errors.
2. basic encoding rules. Rules for encoding data units described in the ISO ASN.1 standard. See also *ASN.1*.

**Berkeley Internet Name Domain**

See *BIND*.

**Berkeley Standard Distribution**

See *BSD*.

**BERT**

bit error rate tester. Device that determines the BER on a given communications channel. See also *BER*, bit error rate.

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**best-effort delivery**

Describes a network system that does not use a sophisticated acknowledgment system to guarantee reliable delivery of information.

**BGP**

Border Gateway Protocol. Interdomain routing protocol that replaces EGP. BGP exchanges reachability information with other BGP systems. It is defined by RFC 1163. See also *BGP4* and *EGP*.

**BGP4**

BGP Version 4. Version 4 of the predominant interdomain routing protocol used on the Internet. BGP4 supports CIDR and uses route aggregation mechanisms to reduce the size of routing tables. See also *BGP* and *CIDR*.

**BIA**

burned-in MAC address.

**BICI**

Broadband Inter-Carrier Interface. ITU-T standard that defines the protocols and procedures needed for establishing, maintaining, and terminating broadband switched virtual connections between public networks.

**BIGA**

See *BIGA* (Bus Interface Gate Array) in the “Cisco Systems Terms and Acronyms” section.

**big-endian**

Method of storing or transmitting data in which the most significant bit or byte is presented first. Compare with *little-endian*.

**binary**

Numbering system characterized by ones and zeros (1 = on, 0 = off).

**binary 8-zero substitution**

See *B8ZS*.

**binary coded alternate mark inversion**

See *AMI*.

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**binary synchronous communication**

See *BSC*.

**Binary Synchronous Communication Protocol**

See *bisync*.

**BIND**

Berkeley Internet Name Domain. Implementation of DNS developed and distributed by the University of California at Berkeley (United States). Many Internet hosts run BIND, which is the ancestor of many commercial BIND implementations.

**BinHex**

Binary Hexadecimal. Method for converting binary files into ASCII for transmission by applications, such as e-mail, that can only handle ASCII.

**BIP**

bit interleaved parity. In ATM, a method used to monitor errors on a link. A check bit or word is sent in the link overhead for the previous block or frame. Bit errors in the payload can then be detected and reported as maintenance information.

**biphase coding**

Bipolar coding scheme originally developed for use in Ethernet. Clocking information is embedded into and recovered from the synchronous data stream without the need for separate clocking leads. The biphase signal contains no direct current energy.

**bipolar**

Electrical characteristic denoting a circuit with both negative and positive polarity. Contrast with *unipolar*.

**bipolar 8-zero substitution**

See *B8ZS*.

**BISDN**

Broadband ISDN. ITU-T communication standards designed to handle high-bandwidth applications such as video. BISDN currently uses ATM technology over SONET-based transmission circuits to provide data rates from 155 to 622 Mbps and beyond. Contrast with *N-ISDN*. See also *BRI*, *ISDN*, and *PRI*.

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**bisync**

Binary Synchronous Communication Protocol. Character-oriented data-link protocol for applications. Contrast with Synchronous Data Link Control (*SDLC*).

**bit**

Binary digit used in the binary numbering system. Can be 0 or 1.

**bit error rate**

See *BER*.

**bit error rate tester**

See *BERT*.

**bit interleaved parity**

See *BIP*.

**BITNET**

“Because It’s Time” Networking Services. Low-cost, low-speed academic network consisting primarily of IBM mainframes and 9600-bps leased lines. BITNET is now part of CREN. See also *CREN*.

**BITNET III**

Dial-up service providing connectivity for members of CREN. See also *CREN*.

**bit-oriented protocol**

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

**bit rate**

Speed at which bits are transmitted, usually expressed in bits per second.

**bits per second**

Abbreviated *bps*. See also *bit rate*.



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**black hole**

Routing term for an area of the internetwork where packets enter, but do not emerge, due to adverse conditions or poor system configuration within a portion of the network.

**blocking**

In a switching system, a condition in which no paths are available to complete a circuit. The term is also used to describe a situation in which one activity cannot begin until another is completed.

**block multiplexer channel**

IBM-style channel that implements the FIPS-60 channel, a U.S. channel standard. This channel is also referred to as *OEMI channel* and *370 block mux channel*.

**blower**

Internal cooling fan used in larger router and switch chassis.

**BLSR**

Bidirectional Line Switch Ring. SONET ring architecture that provides working and protection fibers between nodes. If the working fiber between nodes is cut, traffic is automatically routed onto the protection fiber. See also *SONET*.

**BNC connector**

Standard connector used to connect IEEE 802.3 10Base2 coaxial cable to an MAU.

**BNI**

Broadband Network Interface.

**BNM**

Broadband Network Module.

**BNN**

boundary network node. In SNA terminology, a subarea node that provides boundary function support for adjacent peripheral nodes. This support includes sequencing, pacing, and address translation. Also called *boundary node*.

**BOC**

Bell operating company. Twenty-two local phone companies formed by the breakup of AT&T. See *RBOC*.

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**Bolt, Beranek, and Newman, Inc.**

See *BBN*.

**BOOTP**

Bootstrap Protocol. Protocol used by a network node to determine the IP address of its Ethernet interfaces, in order to affect network booting.

**boot programmable read-only memory**

See *boot PROM*.

**boot PROM**

boot programmable read-only memory. Chip mounted on a printed circuit board used to provide executable boot instructions to a computer device.

**Bootstrap Protocol**

See *BOOTP*.

**border gateway**

Router that communicates with routers in other autonomous systems.

**Border Gateway Protocol**

See *BGP*.

**boundary function**

Capability of SNA subarea nodes to provide protocol support for attached peripheral nodes. Typically found in IBM 3745 devices.

**boundary network node**

See *BNN*.

**boundary node**

See *BNN*.

**BPDU**

Bridge Protocol Data Unit. Spanning-Tree Protocol hello packet that is sent out at configurable intervals to exchange information among bridges in the network. See also *PDU*.

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**BPI**

baseline privacy interface.

**bps**

bits per second.

**BPV**

bipolar violation.

**BPX Service Node**

See *BPX Service Node* in the “Cisco Systems Terms and Acronyms” section.

**break-out/break-in**

See *BOBI* in the “Cisco Systems Terms and Acronyms” section.

**BRHR**

Basic Research and Human Resources. Component of the HPCC program designed to support research, training, and education in computer science, computer engineering, and computational science. See also *HPCC*.

**BRF**

bridge relay function.

**BRI**

Basic Rate Interface. ISDN interface composed of two B channels and one D channel for circuit-switched communication of voice, video, and data. Compare with *PRI*. See also *BISDN*, *ISDN*, and *N-ISDN*.

**bridge**

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

**bridge forwarding**

Process that uses entries in a filtering database to determine whether frames with a given MAC destination address can be forwarded to a given port or ports. Described in the IEEE 802.1 standard. See also *IEEE 802.1*.

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**bridge group**

Bridging feature that assigns network interfaces to a particular spanning-tree group. Bridge groups can be compatible with the IEEE 802.1 or the DEC specification.

**bridge number**

Number that identifies each bridge in an SRB LAN. Parallel bridges must have different bridge numbers.

**bridge protocol data unit**

See *BPDU*.

**bridge static filtering**

Process in which a bridge maintains a filtering database consisting of static entries. Each static entry equates a MAC destination address with a port that can receive frames with this MAC destination address and a set of ports on which the frames can be transmitted. Defined in the IEEE 802.1 standard. See also *IEEE 802.1*.

**broadband**

1. Transmission system that multiplexes multiple independent signals onto one cable.
2. Telecommunications terminology: Any channel having a bandwidth greater than a voice-grade channel (4 kHz).
3. LAN terminology: A coaxial cable on which analog signaling is used. Also called *wideband*. Contrast with *baseband*.

**Broadband ISDN**

See *BISDN*.

**Broadband Network Interface**

See *BNI*.

**Broadband Network Module**

See *BNM*.

**Broadband Switch Module**

See *BXM*.

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**broadcast**

Data packet that will be sent to all nodes on a network. Broadcasts are identified by a broadcast address. Compare with *multicast* and *unicast*. See also *broadcast address*.

**broadcast address**

Special address reserved for sending a message to all stations. Generally, a broadcast address is a MAC destination address of all ones. Compare with *multicast address* and *unicast address*. See also *broadcast*.

**broadcast and unknown server**

See *BUS*.

**broadcast domain**

Set of all devices that will receive broadcast frames originating from any device within the set. Broadcast domains are typically bounded by routers because routers do not forward broadcast frames.

**broadcast search**

Propagation of a search request to all network nodes if the location of a resource is unknown to the requester. See also *directed search*.

**broadcast storm**

Undesirable network event in which many broadcasts are sent simultaneously across all network segments. A broadcast storm uses substantial network bandwidth and, typically, causes network time-outs.

**router**

Concatenation of “bridge” and “router.” Used to refer to devices which perform both bridging and routing functions.

**browser**

GUI-based hypertext client application, such as Internet Explorer, Mosaic, and Netscape Navigator, used to access hypertext documents and other services located on innumerable remote servers throughout the WWW and Internet. See also *hypertext*, *Internet*, *Mosaic*, and *WWW*.

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**BSC**

binary synchronous communication. Character-oriented data link layer protocol for half-duplex applications. A form of telecommunication line control that uses a standard set of transmission control characters and control character sequences, for binary synchronous transmission of binary-coded data between stations. Often referred to simply as .

**BSD**

Berkeley Standard Distribution. Term used to describe any of a variety of UNIX-type operating systems based on the UC Berkeley BSD operating system.

**BSTUN**

Block Serial Tunneling.

**BT**

burst tolerance. Parameter defined by the ATM Forum for ATM traffic management. For VBR connections, BT determines the size of the maximum burst of contiguous cells that can be transmitted. See also *VBR*.

**BTU**

British thermal units.

**BTW**

by the way. One of many short-hand phrases used in chat sessions and e-mail conversations. See also *IMHO*.

**buffer**

Storage area used for handling data in transit. Buffers are used in internetworking to compensate for differences in processing speed between network devices. Bursts of data can be stored in buffers until they can be handled by slower processing devices. Sometimes referred to as a *packet buffer*.

**build**

Create flat files that are ready for use by the signaling controller database.

**burst tolerance**

See *BSTUN*.

---

**BUS**

broadcast and unknown server. Multicast server used in ELANs that is used to flood traffic addressed to an unknown destination and to forward multicast and broadcast traffic to the appropriate clients. See also *ELAN*.

**bus**

1. Common physical signal path composed of wires or other media across which signals can be sent from one part of a computer to another. Sometimes called highway.

2. See *bus topology*.

**bus and tag channel**

IBM channel, developed in the 1960s, incorporating copper multiwire technology. Replaced by the ESCON channel. See also *ESCON channel* and *parallel channel*.

**Bus Interface Gate Array**

See *BIGA* in the “Cisco Systems Terms and Acronyms” section.

**bus topology**

Linear LAN architecture in which transmissions from network stations propagate the length of the medium and are received by all other stations. Compare with *ring topology*, *star topology*, and *tree topology*.

**BVI**

Bridge Group Virtual Interface.

**BX.25**

AT&T implementation of X.25. See also *X.25*.

**BXM**

Broadband Switch Module.

**bypass mode**

Operating mode on FDDI and Token Ring networks in which an interface has been removed from the ring.

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**bypass relay**

Allows a particular Token Ring interface to be shut down and thus effectively removed from the ring.

**byte**

Term used to refer to a series of consecutive binary digits that are operated upon as a unit (for example, an 8-bit byte).

**byte-oriented protocol**

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

**byte reversal**

Process of storing numeric data with the least-significant byte first. Used for integers and addresses on devices with Intel microprocessors.



# C

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**CA**

1. certification authority.
2. Telecommunications: call appearance.

**cable**

Transmission medium of copper wire or optical fiber wrapped in a protective cover.

**cable range**

Range of network numbers that is valid for use by nodes on an extended AppleTalk network. The cable range value can be a single network number or a contiguous sequence of several network numbers. Node addresses are assigned based on the cable range values.

**cable television**

See *CATV*.

**CAC**

connection admission control. Set of actions taken by each ATM switch during connection setup in order to determine whether a connection's requested QoS will violate the QoS guarantees for established connections. CAC is also used when routing a connection request through an ATM network.

**caching**

Form of replication in which information learned during a previous transaction is used to process later transactions.

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**CAF**

controllable ATM fabric.

**cage**

Piece of hardware into which cards are installed.

**California Education and Research Federation Network**

See *CERFnet*.

**Call Detail Record**

See *CDR* in the “Cisco Systems Terms and Acronyms” section.

**call leg**

Discrete segment of a call connection. A call leg is a logical connection between the router and either a telephony endpoint over a bearer channel, or another endpoint using a session protocol.

**call priority**

Priority assigned to each origination port in circuit-switched systems. This priority defines the order in which calls are reconnected. Call priority also defines which calls can or cannot be placed during a bandwidth reservation. See also *bandwidth reservation*.

**call reference value**

See *CRV*.

**call setup time**

Time required to establish a switched call between DTE devices.

**CAM**

content-addressable memory. See *associative memory*. See also *CAM* in the “Cisco Systems Terms and Acronyms” section.

**Canadian Standards Association**

See *CSA*.

---

**CAP**

Competitive Access Provider. Independent company providing local telecommunications services mainly to business customers in competition with an area's BOC or IOC. Teleport and MFS are the two major CAPs operating in major metropolitan areas in the United States. See also *BOC* and *IOC*.

**carrier**

Electromagnetic wave or alternating current of a single frequency, suitable for modulation by another, data-bearing signal. See also *modulation*.

**Carrier Detect**

See *CD*.

**carrier sense multiple access collision detect**

See *CSMA*.

**CAS**

channel associated signaling.

**Category 1 cabling**

One of five grades of UTP cabling described in the EIA/TIA-586 standard. Category 1 cabling is used for telephone communications and is not suitable for transmitting data. Compare with *Category 2 cabling*, *Category 3 cabling*, *Category 4 cabling*, and *Category 5 cabling*. See also *EIA/TIA-586* and *UTP*.

**Category 2 cabling**

One of five grades of UTP cabling described in the EIA/TIA-586 standard. Category 2 cabling is capable of transmitting data at speeds up to 4 Mbps. Compare with *Category 1 cabling*, *Category 3 cabling*, *Category 4 cabling*, and *Category 5 cabling*. See also *EIA/TIA-586* and *UTP*.

**Category 3 cabling**

One of five grades of UTP cabling described in the EIA/TIA-586 standard. Category 3 cabling is used in 10BaseT networks and can transmit data at speeds up to 10 Mbps. Compare with *Category 1 cabling*, *Category 2 cabling*, *Category 4 cabling*, and *Category 5 cabling*. See also *EIA/TIA-586* and *UTP*.

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**Category 4 cabling**

One of five grades of UTP cabling described in the EIA/TIA-586 standard. Category 4 cabling is used in Token Ring networks and can transmit data at speeds up to 16 Mbps. Compare with *Category 1 cabling*, *Category 2 cabling*, *Category 3 cabling*, and *Category 5 cabling*. See also *EIA/TIA-586* and *UTP*.

**Category 5 cabling**

One of five grades of UTP cabling described in the EIA/TIA-586 standard. Category 5 cabling can transmit data at speeds up to 100 Mbps. Compare with *Category 1 cabling*, *Category 2 cabling*, *Category 3 cabling*, and *Category 4 cabling*. See also *EIA/TIA-586* and *UTP*.

**catenet**

Network in which hosts are connected to diverse networks, which themselves are connected with routers. The Internet is a prominent example of a catenet.

**CATV**

cable television. Communication system where multiple channels of programming material are transmitted to homes using broadband coaxial cable. Formerly called Community Antenna Television.

**CBAC**

Context-based Access Control. Protocol that provides internal users with secure access control for each application and for all traffic across network perimeters. CBAC enhances security by scrutinizing both source and destination addresses and by tracking each application's connection status.

**CBDS**

Connectionless Broadband Data Service. European high-speed, packet-switched, datagram-based WAN networking technology. Similar to SMDS. See also *SMDS*.

**CBR**

constant bit rate. QoS class defined by the ATM Forum for ATM networks. CBR is used for connections that depend on precise clocking to ensure undistorted delivery. Compare with *ABR*, *UBR*, and *VBR*.

**CCB**

call control block.

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**CCITT**

Consultative Committee for International Telegraph and Telephone. International organization responsible for the development of communications standards. Now called the ITU-T. See *ITU-T*.

**CCOT**

cross office transfer time.

**CCR**

commitment, concurrency, and recovery. OSI application service element used to create atomic operations across distributed systems. Used primarily to implement two-phase commit for transactions and nonstop operations.

**CCS**

common channel signaling. Signaling system used in telephone networks that separates signaling information from user data. A specified channel is exclusively designated to carry signaling information for all other channels in the system. See also *SS7*.

**CD**

Carrier Detect. Signal that indicates whether an interface is active. Also, a signal generated by a modem indicating that a call has been connected.

**CDDI**

Copper Distributed Data Interface. Implementation of FDDI protocols over STP and UTP cabling. CDDI transmits over relatively short distances (about 90 yards [100 meters]), providing data rates of 100 Mbps using a dual-ring architecture to provide redundancy. Based on the ANSI TPPMD standard. Compare with *FDDI*.

**CDF**

channel definition format. Technology for “push” applications on the World Wide Web. CDF is an application of XML. See *XML*.

**CDP**

See *CDP* (Cisco Discovery Protocol) in the “Cisco Systems Terms and Acronyms” section.

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**CDPD**

Cellular Digital Packet Data. Open standard for two-way wireless data communication over high-frequency cellular telephone channels. Allows data transmissions between a remote cellular link and a NAP. Operates at 19.2 Kbps.

**CDR**

call detail record.

**CDV**

cell delay variation. Component of cell transfer delay, which is induced by buffering and cell scheduling. CDV is a QoS delay parameter associated with CBR and VBR service. See also *CBR* and *VBR*.

**CDVT**

cell delay variation tolerance. In ATM, a QoS parameter for managing traffic that is specified when a connection is set up. In CBR transmissions, CDVT determines the level of jitter that is tolerable for the data samples taken by the PCR. See also *CBR* and *PCR*.

**CEF**

See *CEF* in the in the “Cisco Systems Terms and Acronyms” section.

**cell**

Basic data unit for ATM switching and multiplexing. Cells contain identifiers that specify the data stream to which they belong. Each cell consists of a 5-byte header and 48 bytes of payload. See also *cell relay*.

**cell delay variation**

See *CDV*.

**cell delay variation tolerance**

See *CDVT*.

**cell loss priority**

See *CLP*.

**cell loss ratio**

See *CLR*.

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**cell payload scrambling**

Technique using an ATM switch to maintain framing on some medium-speed edge and trunk interfaces.

**cell relay**

Network technology based on the use of small, fixed-size packets, or cells. Because cells are fixed-length, they can be processed and switched in hardware at high speeds. Cell relay is the basis for many high-speed network protocols including ATM, IEEE 802.6, and SMDS. See also *cell*.

**cells per second**

Abbreviated cps.

**cell transfer delay**

See *CTD*.

**Cellular Digital Packet Data**

See *CDPD*.

**cellular radio**

Technology that uses radio transmissions to access telephone-company networks. Service is provided in a particular area by a low-power transmitter.

**CELP**

code excited linear prediction compression. Compression algorithm used in low bit-rate voice encoding. Used in ITU-T Recommendations G.728, G.729, G.723.1.

**central office**

See *CO*.

**Centrex**

LEC service that provides local switching applications similar to those provided by an onsite PBX. With Centrex, there is no onsite switching; all customer connections go back to the CO. See also *CO* and *LEC*.

**CEPT**

Conférence Européenne des Postes et des Télécommunications. Association of the 26 European PTTs that recommends communication specifications to the ITU-T.

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**CER**

cell error ratio. In ATM, the ratio of transmitted cells that have errors to the total cells sent in a transmission for a specific period of time.

**CERFnet**

California Education and Research Federation Network. TCP/IP network, based in Southern California, that connects hundreds of higher-education centers internationally while also providing Internet access to subscribers. CERFnet was founded in 1988 by the San Diego Supercomputer Center and General Atomics, and is funded by the NSF.

**CERN**

European Laboratory for Particle Physics. Birthplace of the World Wide Web.

**CERT**

Computer Emergency Response Team. Chartered to work with the Internet community to facilitate its response to computer security events involving Internet hosts, to take proactive steps to raise the community's awareness of computer security issues, and to conduct research targeted at improving the security of existing systems. The U.S. CERT is based at Carnegie Mellon University in Pittsburgh (United States), Regional CERTs are, like NICs, springing up in different parts of the world.

**CES**

circuit emulation service. Enables users to multiplex or concentrate multiple circuit emulation streams for voice and video with packet data on a single high-speed ATM link without a separate ATM access multiplexer.

**CFRAD**

See *Cisco FRAD* in the "Cisco Systems Terms and Acronyms" section.

**CGI**

Common Gateway Interface. Set of rules that describe how a Web server communicates with another application running on the same computer and how the application (called a CGI program) communicates with the Web server. Any application can be a CGI program if it handles input and output according to the CGI standard.

**chaining**

SNA concept in which RUs are grouped together for the purpose of error recovery.



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**Challenge Handshake Authentication Protocol**

See *CHAP*.

**channel**

1. Communication path. Multiple channels can be multiplexed over a single cable in certain environments.
2. In IBM, the specific path between large computers (such as mainframes) and attached peripheral devices.
3. Specific frequency allocation and bandwidth. Downstream channels are used for television in the United States are 6 MHz wide.

**channel-attached**

Pertaining to attachment of devices directly by data channels (input/output channels) to a computer.

**channel definition format.**

See *CDF*.

**Channel Interface Processor**

See *CIP* in the “Cisco Systems Terms and Acronyms” section.

**channel service unit**

See *CSU*.

**channelized E1**

Access link operating at 2.048 Mbps that is subdivided into 30 B-channels and 1 D-channel. Supports DDR, Frame Relay, and X.25. Compare with *channelized T1*.

**channelized T1**

Access link operating at 1.544 Mbps that is subdivided into 24 channels (23 B-channels and 1 D-channel) of 64 Kbps each. The individual channels or groups of channels connect to different destinations. Supports DDR, Frame Relay, and X.25. Also called *fractional T1*. Compare with *channelized E1*.

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**CHAP**

Challenge Handshake Authentication Protocol. Security feature supported on lines using PPP encapsulation that prevents unauthorized access. CHAP does not itself prevent unauthorized access, it merely identifies the remote end. The router or access server then determines whether that user is allowed access. Compare to *PAP*.

**chat script**

String of text that defines the login “conversation” that occurs between two systems. Consists of expect-send pairs that define the string that the local system expects to receive from the remote system and what the local system should send as a reply.

**Cheapernet**

Industry term used to refer to the IEEE 802.3 10Base2 standard or the cable specified in that standard. Compare with *Thinnet*. See also *10Base2*, *Ethernet*, and *IEEE 802.3*.

**checksum**

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

**child peer group**

Peer group for which another peer group is the parent peer group. See also *LGN*, *peer group*, and *parent peer group*.

**choke packet**

Packet sent to a transmitter to tell it that congestion exists and that it should reduce its sending rate.

**CIA**

classical IP over ATM. Specification for running IP over ATM in a manner that takes full advantage of the features of ATM. Defined in RFC 1577.

**CICNet**

Regional network that connects academic, research, nonprofit, and commercial organizations in the Midwestern United States. Founded in 1988, CICNet was a part of the NSFNET and was funded by the NSF until the NSFNET dissolved in 1995. See also *NSFNET*.

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**CICS**

Customer Information Control System. IBM application subsystem allowing transactions entered at remote terminals to be processed concurrently by user applications.

**CID**

1. craft interface device. Terminal or PC-based interface that enables the performance of local maintenance operations.
2. channel ID. Designates the Frame Relay subchannel ID for Voice over Frame Relay.

**CIDR**

classless interdomain routing. Technique supported by BGP4 and based on route aggregation. CIDR allows routers to group routes together in order to cut down on the quantity of routing information carried by the core routers. With CIDR, several IP networks appear to networks outside the group as a single, larger entity. With CIDR, IP addresses and their subnet masks are written as 4 octets, separated by periods, followed by a forward slash and a 2-digit number that represents the subnet mask. See also *BGP4*.

**CIP**

See *CIP* (Channel Interface Processor) in the “Cisco Systems Terms and Acronyms” section.

**CIR**

committed information rate. Rate at which a Frame Relay network agrees to transfer information under normal conditions, averaged over a minimum increment of time. CIR, measured in bits per second, is one of the key negotiated tariff metrics. See also *Bc*.

**circuit**

Communications path between two or more points.

**circuit group**

Grouping of associated serial lines that link two bridges. If one of the serial links in a circuit group is in the spanning tree for a network, any of the serial links in the circuit group can be used for load balancing. This load-balancing strategy avoids data ordering problems by assigning each destination address to a particular serial link.

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**circuit steering**

Mechanism used by some ATM switches to eavesdrop on a virtual connection and copy its cells to another port where an ATM analyzer is attached. Also known as *port snooping*.

**circuit switching**

Switching system in which a dedicated physical circuit path must exist between sender and receiver for the duration of the “call.” Used heavily in the telephone company network. Circuit switching can be contrasted with *contention* and *token passing* as a channel-access method, and with *message switching* and *packet switching* as a switching technique.

**C-ISUP**

See *C-ISUP* in the “Cisco Systems Terms and Acronyms” section. See also *ISUP*.

**ciscoBus controller**

See *SP* in the “Cisco Systems Terms and Acronyms” section.

**Cisco Discovery Protocol**

See *CDP* in the “Cisco Systems Terms and Acronyms” section.

**Cisco FRAD**

See *Cisco FRAD* in the “Cisco Systems Terms and Acronyms” section.

**Cisco Frame Relay access device**

See *Cisco FRAD* in the “Cisco Systems Terms and Acronyms” section.

**CiscoFusion**

See *CiscoFusion* in the “Cisco Systems Terms and Acronyms” section.

**Cisco Internetwork Operating System software**

See *Cisco IOS* in the “Cisco Systems Terms and Acronyms” section.

**Cisco IOS**

See *Cisco IOS* in the “Cisco Systems Terms and Acronyms” section.

**Cisco Link Services**

See *CLS* in the “Cisco Systems Terms and Acronyms” section.

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**Cisco Link Services Interface**

See *CLSI* in the “Cisco Systems Terms and Acronyms” section.

**Cisco-trunk (private line) call**

See *Cisco-trunk (private line) call* in the “Cisco Systems Terms and Acronyms” section.

**CiscoView**

See *Cisco-trunk (private line) call* in the “Cisco Systems Terms and Acronyms” section.

**CIX**

Commercial Internet Exchange. A connection point between the commercial Internet service providers. Pronounced “kicks.” See *FIX* and *GIX*.

**Class A station**

See *DAS*.

**Class B station**

See *SAS*.

**classical IP over ATM**

See *CIA*.

**classless interdomain routing**

See *CIDR*.

**class of service**

See *CoS*.

**CLAW**

Common Link Access for Workstations. Data link layer protocol used by channel-attached RISC System/6000 series systems and by IBM 3172 devices running TCP/IP off-load. CLAW improves efficiency of channel use and allows the CIP to provide the functionality of a 3172 in TCP/IP environments and support direct channel attachment. The output from TCP/IP mainframe processing is a series of IP datagrams that the router can switch without modifications.

**Clear To Send**

See *CTS*.

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**clear channel**

Channel that uses out-of-band signaling (as opposed to in-band signaling), so the channel's entire bit rate is available.

**CLEC**

competitive local exchange carrier. Company that builds and operates communication networks in metropolitan areas and provides its customers with an alternative to the local telephone company. See *CAP*.

**CLI**

1. command line interface. Interface that allows the user to interact with the operating system by entering commands and optional arguments. The UNIX operating system and DOS provide CLIs. Compare with *GUI*.

2. Command Language Interpreter. Basic Cisco IOS configuration and management interface.

**client**

Node or software program (front-end device) that requests services from a server. See also *back end*, *FRF.11*, and *server*.

**client/server computing**

Term used to describe distributed computing (processing) network systems in which transaction responsibilities are divided into two parts: client (front end) and server (back end). Both terms (client and server) can be applied to software programs or actual computing devices. Also called *distributed computing (processing)*. Compare with *peer-to-peer computing*. See also *RPC*.

**client-server model**

Common way to describe network services and the model user processes (programs) of those services. Examples include the nameserver/namesolver paradigm of the DNS and fileserver/file-client relationships such as NFS and diskless hosts.

**CLNP**

Connectionless Network Protocol. OSI network layer protocol that does not require a circuit to be established before data is transmitted. See also *CLNS*.

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**CLNS**

Connectionless Network Service. OSI network layer service that does not require a circuit to be established before data is transmitted. CLNS routes messages to their destinations independently of any other messages. See also *CLNP*.

**CLP**

cell loss priority. Field in the ATM cell header that determines the probability of a cell being dropped if the network becomes congested. Cells with CLP = 0 are insured traffic, which is unlikely to be dropped. Cells with CLP = 1 are best-effort traffic, which might be dropped in congested conditions in order to free up resources to handle insured traffic.

**CLR**

cell loss ratio. In ATM, the ratio of discarded cells to cells that are successfully transmitted. CLR can be set as a QoS parameter when a connection is set up.

**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**

1. Generally, an intelligent device that provides the connections for a cluster of terminals to a data link.
2. In SNA, a programmable device that controls the input/output operations of attached devices. Typically, an IBM 3174 or 3274 device.

**CMI**

1. coded mark inversion. ITU-T line coding technique specified for STS-3c transmissions. Also used in DS-1 systems. See also *DS-1* and *STS-3c*.
2. control mode idle?

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**CMIP**

Common Management Information Protocol. OSI network management protocol created and standardized by ISO for the monitoring and control of heterogeneous networks. See also *CMIS*.

**CMIS**

Common Management Information Services. OSI network management service interface created and standardized by ISO for the monitoring and control of heterogeneous networks. See also *CMIP*.

**CMNS**

Connection-Mode Network Service. Extends local X.25 switching to a variety of media (Ethernet, FDDI, Token Ring). See also *CONP*.

**CMT**

connection management. FDDI process that handles the transition of the ring through its various states (off, active, connect, and so on), as defined by the ANSI X3T9.5 specification.

**CMTS**

cable modem termination system. Any DOCSIS-compliant headend cable router, such as the Cisco uBR7246.

**CO**

central office. Local telephone company office to which all local loops in a given area connect and in which circuit switching of subscriber lines occurs.

**coaxial cable**

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



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**codec**

coder-decoder.

1. Integrated circuit device that typically uses pulse code modulation to transform analog signals into a digital bit stream and digital signals back into analog signals.
2. In Voice over IP, Voice over Frame Relay, and Voice over ATM, a DSP software algorithm used to compress/decompress speech or audio signals.

**coded mark inversion**

See *CMI*.

**coder-decoder**

See *CODEC*.

**coding**

Electrical techniques used to convey binary signals.

**CO FRAD**

central office frame relay access device.

**CO-IPX**

Connection Oriented IPX. Native ATM protocol based on IPX under development by Novell.

**collapsed backbone**

Nondistributed backbone in which all network segments are interconnected by way of an internetworking device. A collapsed backbone might be a virtual network segment existing in a device such as a hub, a router, or a switch.

**collision**

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

**collision detection**

See *CSI*.

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**collision domain**

In Ethernet, the network area within which frames that have collided are propagated. Repeaters and hubs propagate collisions; LAN switches, bridges and routers do not. See also *collision*.

**command line interface**

See *CLI*.

**Committed Burst**

See *Bc*.

**committed information rate**

See *CIR*.

**common carrier**

Licensed, private utility company that supplies communication services to the public at regulated prices.

**common channel signaling**

See *CCS*.

**Common Gateway Interface**

See *CGI*.

**Common Link Access for Workstations**

See *CLAW*.

**Common Management Information Protocol**

See *CMIP*.

**Common Management Information Services**

See *CMIS*.

**common part convergence sublayer**

See *CPCS*.

**Common Programming Interface for Communications**

See *CPI-C*.

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**common transport semantic**

See *CTS*.

**communication**

Transmission of information.

**communication controller**

In SNA, a subarea node (such as an IBM 3745 device) that contains an NCP.

**communication server**

Communications processor that connects asynchronous devices to a LAN or WAN through network and terminal emulation software. Performs only asynchronous routing of IP and IPX. Compare with *access server*.

**communications line**

Physical link (such as wire or a telephone circuit) that connects one or more devices to one or more other devices.

**community**

In SNMP, a logical group of managed devices and NMSs in the same administrative domain.

**Community Antenna Television**

Now known as CATV. See *CATV*.

**community name**

See *community string*.

**community string**

Text string that acts as a password and is used to authenticate messages sent between a management station and a router containing an SNMP agent. The community string is sent in every packet between the manager and the agent. Also called a *community name*.

**companding**

Contraction derived from the opposite processes of compression and expansion. Part of the PCM process whereby analog signal values are logically rounded to discrete scale-step values on a nonlinear scale. The decimal step number is then coded in its

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binary equivalent prior to transmission. The process is reversed at the receiving terminal using the same nonlinear scale. Compare with *compression* and *expansion*. See also *a-law* and *mu-law*.

**complete sequence number PDU**

See *CSNP*.

**Compressed Serial Link Internet Protocol**

See *CSI*.

**compression**

The running of a data set through an algorithm that reduces the space required to store or the bandwidth required to transmit the data set. Compare with *companding* and *expansion*.

**Computer Science Network**

See *CSNET*.

**concentrator**

See *hub*.

**CONF**

configuration failure. Resource is OOS because its provisioning information is inconsistent.

**Conférence Européenne des Postes et des Télécommunications**

See *CEPT*.

**configuration direct VCC**

In ATM, a bi-directional point-to-point VCC set up by a LEC to an LES. One of three control connections defined by Phase 1 LANE. Compare with *control distribute VCC* and *control direct VCC*.

**configuration management**

One of five categories of network management defined by ISO for management of OSI networks. Configuration management subsystems are responsible for detecting and determining the state of a network. See also *accounting management*, *fault management*, *performance management*, and *security management*.

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**configuration register**

See *configuration register* in the “Cisco Systems Terms and Acronyms” section.

**configuration tool**

1. Service management tool with a GUI.
2. Element management service tool with a GUI.

**congestion**

Traffic in excess of network capacity.

**congestion avoidance**

Mechanism by which an ATM network controls traffic entering the network to minimize delays. In order to use resources most efficiently, lower-priority traffic is discarded at the edge of the network if conditions indicate that it cannot be delivered.

**congestion collapse**

Condition in which the retransmission of frames in an ATM network results in little or no traffic successfully arriving at the destination. Congestion collapse frequently occurs in ATM networks composed of switches that do not have adequate and effective buffering mechanisms complimented by intelligent packet discard or ABR congestion feedback mechanisms.

**connection admission control**

See *CAC*.

**connectionless**

Term used to describe data transfer without the existence of a virtual circuit. Compare with *connection-oriented*. See also *virtual circuit*.

**Connectionless Broadband Data Service**

See *CBDS*.

**Connectionless Network Protocol**

See *CLNP*.

**Connectionless Network Service**

See *CLNS*.

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**connection management**

See *CMT*.

**Connection-Mode Network Service**

See *CMNS*.

**connection-oriented**

Term used to describe data transfer that requires the establishment of a virtual circuit. See also *connectionless* and *virtual circuit*.

**Connection-Oriented Network Protocol**

See *CONP*.

**CONP**

Connection-Oriented Network Protocol. OSI protocol providing connection-oriented operation to upper-layer protocols. See also *CMNS*.

**CONS**

connection-oriented network service.

**console**

DTE through which commands are entered into a host.

**constant bit rate**

See *CBR*.

**Consultative Committee for International Telegraph and Telephone**

See *CCITT*.

**content-addressable memory**

See *associative memory*.

**contention**

Access method in which network devices compete for permission to access the physical medium. Compare with *circuit switching* and *token passing*.

**Context-based Access Control**

See *CCB*.

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**control direct VCC**

In ATM, a bidirectional VCC set up by a LEC to a LES. One of three control connections defined by Phase 1 LANE. Compare with *configuration direct VCC* and *control distribute VCC*.

**control distribute VCC**

In ATM, a unidirectional VCC set up from a LES to a LEC. One of three control connections defined by Phase 1 LANE. Typically, the VCC is a point-to-multipoint connection. Compare with *configuration direct VCC* and *control direct VCC*.

**control point**

See *CP*.

**convergence**

Speed and ability of a group of internetworking devices running a specific routing protocol to agree on the topology of an internetwork after a change in that topology.

**convergence sublayer**

See *CS*.

**conversation**

In SNA, an LU 6.2 session between two transaction programs.

**cookie**

Piece of information sent by a Web server to a Web browser that the browser is expected to save and send back to the Web server whenever the browser makes additional requests of the Web server.

**Cooperation for Open Systems Interconnection Networking in Europe**

See *COSINE*.

**COOS**

Commanded OOS. A resource is OOS because it was entered as a command. See also *OOS* in the “Cisco Systems Terms and Acronyms” section.

**Copper Distributed Data Interface**

See *CDDI*.

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**COPS**

Common Open Policy Service. Quality-of-service (QoS) policy exchange protocol proposed as an IETF standard for communicating network QoS policy information.

**CORBA**

Common Object Request Broker Architecture. OMG's answer to the need for interoperability among the rapidly proliferating number of hardware and software products available today. Simply stated, CORBA allows applications to communicate with one another no matter where they are located or who has designed them. See *IIOP*.

**core gateway**

Primary routers in the Internet.

**core router**

In a packet-switched star topology, a router that is part of the backbone and that serves as the single pipe through which all traffic from peripheral networks must pass on its way to other peripheral networks.

**Corporation for Open Systems**

See *COS*.

**Corporation for Research and Educational Networking**

See *CREN*.

**CoS**

class of service. Indication of how an upper-layer protocol requires a lower-layer protocol to treat its messages. In SNA subarea routing, COS definitions are used by subarea nodes to determine the optimal route to establish a given session. A COS definition comprises a virtual route number and a transmission priority field. Also called *ToS*.

**COS**

Corporation for Open Systems. Organization that promulgates the use of OSI protocols through conformance testing, certification, and related activities.



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**COSINE**

Cooperation for Open Systems Interconnection Networking in Europe. European project financed by the EC to build a communication network between scientific and industrial entities in Europe. The project ended in 1994.

**cost**

Arbitrary value, typically based on hop count, media bandwidth, or other measures, that is assigned by a network administrator and used to compare various paths through an internetwork environment. Cost values are used by routing protocols to determine the most favorable path to a particular destination: the lower the cost, the better the path. Sometimes called *path cost*. See also *routing metric*.

**COT**

Continuity Test. Requirement of the SS7 protocol specifications. It tests the bearer channels' status using either loopback or tone detection and generation. Used to test individual DS0 channels via either loopback or tone detection and generation.

**count to infinity**

Problem that can occur in routing algorithms that are slow to converge, in which routers continuously increment the hop count to particular networks. Typically, some arbitrary hop-count limit is imposed to prevent this problem.

**CP**

1. control point. In SNA networks, element that identifies the APPN networking components of a PU 2.1 node, manages device resources, and provides services to other devices. In APPN, CPs are able to communicate with logically adjacent CPs by way of CP-to-CP sessions. See also *EN* and *NN*.

2. Telecommunications: control processor.

**CPC**

calling party category.

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**CPCS**

1. common part convergence sublayer. One of the two sublayers of any AAL. The CPCS is service-independent and is further divided into the CS and the SAR sublayers. The CPCS is responsible for preparing data for transport across the ATM network, including the creation of the 48-byte payload cells that are passed to the ATM layer. See also *AAL*, *ATM layer*, *CS*, *SAR*, and *SSCS*.

2. Telecommunications: call processing control system.

**CPE**

customer premises equipment. Terminating equipment, such as terminals, telephones, and modems, supplied by the telephone company, installed at customer sites, and connected to the telephone company network.

**CPI-C**

common programming interface for communications. Platform-independent API developed by IBM and used to provide portability in APPC applications. See also *APPC*.

**CPNIE**

called party number information element.

**CPP**

See *CPP* (Combinet Proprietary Protocol) in the “Cisco Systems Terms and Acronyms” section.

**cps**

cells per second.

**CQ**

custom queuing.

**craft interface device**

See *CID*.

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**crankback**

A mechanism used by ATM networks when a connection setup request is blocked because a node along a selected path cannot accept the request. In this case, the path is rolled back to an intermediate node, which attempts to discover another path to the final destination using GCAC. See also *GCAC*.

**CRC**

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

**CREN**

Corporation for Research and Educational Networking. The result of a merger of BITNET and CSNET. CREN is devoted to providing Internet connectivity to its members, which include the alumni, students, faculty, and other affiliates of participating educational and research institutions, via BITNET III. See also *BITNET*, *BITNET III*, and *CSNET*.

**CRF**

Concentrator Relay Function CRMcell rate margin. One of three link attributes exchanged using PTSPs to determine the available resources of an ATM network. CRM is a measure of the difference between the effective bandwidth allocation per traffic class as the allocation for sustainable cell rate.

**CRL**

certificate revocation list.

**cross talk**

Interfering energy transferred from one circuit to another.

**CRV**

call reference value. Number carried in all Q.931 (I.451) messages that provides an identifier for each ISDN call.

**CS**

convergence sublayer. One of the two sublayers of the AAL CPCS, which is responsible for padding and error checking. PDUs passed from the SSCS are appended with an 8-byte trailer (for error checking and other control information) and padded, if

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necessary, so that the length of the resulting PDU is divisible by 48. These PDUs are then passed to the SAR sublayer of the CPCS for further processing. See also *AAL*, *CPCS*, *SAR*, and *SSCS*.

**CSA**

Canadian Standards Association. Canadian agency that certifies products that conform to Canadian national safety standards.

**CS-ACELP**

Conjugate Structure Algebraic Code Excited Linear Prediction. CELP voice compression algorithm providing 8 Kbps, or 8:1 compression, standardized in ITU-T Recommendation G.729.

**CSI**

called subscriber identification. An identifier whose coding format contains the telephone number from a remote fax terminal.

**CSLIP**

Compressed Serial Link Internet Protocol. Extension of SLIP that, when appropriate, allows just header information to be sent across a SLIP connection, reducing overhead and increasing packet throughput on SLIP lines. See also *SLIP*.

**CSM**

call switching module.

**CSMA/CD**

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

**CSNET**

Computer Science Network. Large internetwork consisting primarily of universities, research institutions, and commercial concerns. CSNET merged with BITNET to form CREN. See also *BITNET* and *CREN*.

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**CSNP**

complete sequence number PDU. PDU sent by the designated router in an OSPF network to maintain database synchronization.

**CSU**

channel service unit. Digital interface device that connects end-user equipment to the local digital telephone loop. Often referred to together with DSU, as *CSU/DSU*. See also *DSU*.

**CTD**

cell transfer delay. In ATM, the elapsed time between a cell exit event at the source UNI and the corresponding cell entry event at the destination UNI for a particular connection. The CTD between the two points is the sum of the total inter-ATM node transmission delay and the total ATM node processing delay.

**CTI**

computer telephony integration. Name given to the merger of traditional telecommunications (PBX) equipment with computers and computer applications. The use of Caller ID to automatically retrieve customer information from a database is an example of a CTI application.

**CTS**

1. Clear To Send. Circuit in the EIA/TIA-232 specification that is activated when DCE is ready to accept data from a DTE.

2. common transport semantic. Cornerstone of the IBM strategy to reduce the number of protocols on networks. CTS provides a single API for developers of network software and enables applications to run over APPN, OSI, and TCP/IP.

**CU**

coding unit. Type of access device. (See *access device*.)

**Customer Information Control System**

See *CICS*.

**customer premises equipment**

See *CPE*.

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**cut-through packet switching**

Packet switching approach that streams data through a switch so that the leading edge of a packet exits the switch at the output port before the packet finishes entering the input port. A device using cut-through packet switching reads, processes, and forwards packets as soon as the destination address is looked up and the outgoing port determined. Also known as *on-the-fly packet switching*. Compare with *store and forward packet switching*.

**CxBus**

See *CxBus* (Cisco Extended Bus) in the “Cisco Systems Terms and Acronyms” section.

**Cyberspace**

Term coined by William Gibson in his fantasy novel *Neuromancer* to describe the “world” of computers and the society that gathers around them. Often used to refer to the Internet, the World Wide Web, or some combination thereof.

**cycles per second**

See *hertz*.

**cyclic redundancy check**

See *CRC*.

# D

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**D4 framing**

See *SF*.

**DAC**

dual-attached concentrator. FDDI or CDDI concentrator capable of attaching to both rings of an FDDI or CDDI network. It can also be dual-homed from the master ports of other FDDI or CDDI concentrators.

**DACS**

Digital Access and Crossconnect System. AT&T's term for a digital crossconnect system.

**DAP**

Directory Access Protocol. Protocol used between a DUA and a DSA in an X.500 directory system. See *LDAP*.

**DARPA**

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

**DARPA Internet**

Obsolete term referring to the Internet. See *Internet*.

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**DAS**

1. dual attachment station. Device attached to both the primary and the secondary FDDI rings. Dual attachment provides redundancy for the FDDI ring: if the primary ring fails, the station can wrap the primary ring to the secondary ring, isolating the failure and retaining ring integrity. Also called a *Class A station*. Compare with *SAS*.

2. dynamically assigned socket. Socket that is dynamically assigned by DDP upon request by a client. In an AppleTalk network, the sockets numbered 128 to 254 are allocated as DASs.

**DATABASE2**

See *DB2*.

**database object**

Piece of information that is stored in a database.

**data bus connector**

See *DB connector*.

**data channel**

See *D channel*.

**data circuit-terminating equipment**

See *DCE*.

**data communications equipment**

See *DCE*.

**Data Country Code**

See *DCC*.

**data direct VCC**

In ATM, a bi-directional point-to-point VCC set up between two LECs. One of three data connections defined by Phase 1 LANE. Data direct VCCs do not offer any type of QOS guarantee, so they are typically used for UBR and ABR connections. Compare with *control distribute VCC* and *control direct VCC*.



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**Data Encryption Standard**

See *DES*.

**Data Exchange Interface**

See *DXI*.

**data flow control layer**

Layer 5 of the SNA architectural model. This layer determines and manages interactions between session partners, particularly data flow. Corresponds to the *session layer* of the OSI model. See also *data-link control layer*, *path control layer*, *physical control layer*, *presentation services layer*, *transaction services layer*, and *transmission control layer*.

**datagram**

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

**Datagram Delivery Protocol**

See *DDP*.

**Datakit**

AT&T proprietary packet switching system widely deployed by the RBOCs.

**data-link connection identifier**

See *DLCI*.

**data-link control layer**

Layer 2 in the SNA architectural model. Responsible for the transmission of data over a particular physical link. Corresponds roughly to the *data-link layer* of the OSI model. See also *data flow control layer*, *path control layer*, *physical control layer*, *presentation services layer*, *transaction services layer*, and *transmission control layer*.

**data-link layer**

Layer 2 of the OSI reference model. Provides reliable transit of data across a physical link. The data-link layer is concerned with physical addressing, network topology, line discipline, error notification, ordered delivery of frames, and flow control. The IEEE

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divided this layer into two sublayers: the MAC sublayer and the LLC sublayer. Sometimes simply called *link layer*. Roughly corresponds to the *data-link control layer* of the SNA model. See also *application layer*, *LLC*, *MAC*, *network layer*, *physical layer*, *PQ*, *session layer*, and *transport layer*.

**data-link switching**

See *DLSw*.

**data-link switching plus**

See *DLSw+* in the “Cisco Systems Terms and Acronyms” section.

**Data Movement Processor**

See *DMP* in the “Cisco Systems Terms and Acronyms” section.

**Data Network Identification Code**

See *DNIC*.

**data set ready**

See *DSR*.

**data service unit**

See *DSU*.

**data sink**

Network equipment that accepts data transmissions.

**data stream**

All data transmitted through a communications line in a single read or write operation.

**data terminal equipment**

See *DTE*.

**data terminal ready**

See *DTR*.

**dB**

decibels.

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**DB2**

IBM relational database management system.

**DB connector**

data bus connector. Type of connector used to connect serial and parallel cables to a data bus. DB connector names are in the format DB-*x*, where *x* represents the number of wires within the connector. Each line is connected to a pin on the connector, but in many cases, not all pins are assigned a function. DB connectors are defined by various EIA/TIA standards.

**dBm**

decibels per milliwatt.

**DCA**

Defense Communications Agency. U.S. government organization responsible for DDN networks such as MILNET. Now called *DISA*. See *DISA*.

**DCC**

Data Country Code. One of two ATM address formats developed by the ATM Forum for use by private networks. Adapted from the subnetwork model of addressing in which the ATM layer is responsible for mapping network layer addresses to ATM addresses. Compare with *ICD*.

**DCE**

1. data communications equipment (EIA expansion).
2. data circuit-terminating equipment (ITU-T expansion). Devices and connections of a communications network that comprise the network end of the user-to-network interface. The DCE provides a physical connection to the network, forwards traffic, and provides a clocking signal used to synchronize data transmission between DCE and DTE devices. Modems and interface cards are examples of DCE. Compare with *DTE*.

**DCOM**

Distributed Component Object Model. Protocol that enables software components to communicate directly over a network. Developed by Microsoft and previously called Network OLE, DCOM is designed for use across multiple network transports, including Internet protocols such as HTTP. See *IIOP*.

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**DCS**

Digital Crossconnect System. Network element providing automatic cross-connection of a digital signal or its constituent parts.

**DCT**

discrete cosine transform.

**D channel**

1. data channel. Full-duplex, 16-kbps (BRI) or 64-kbps (PRI) ISDN channel. Compare with *B channel*, *E channel*, and *H channel*.

2. In SNA, a device that connects a processor and main storage with peripherals.

**DDM**

distributed data management. Software in an IBM SNA environment that provides peer-to-peer communication and file sharing. One of three SNA transaction services. See also *DIA* and *SNADS*.

**DDN**

Defense Data Network. U.S. military network composed of an unclassified network (MILNET) and various secret and top-secret networks. DDN is operated and maintained by *DISA*. See also *DISA* and *MILNET*.

**DDP**

Datagram Delivery Protocol. AppleTalk network layer protocol that is responsible for the socket-to-socket delivery of datagrams over an AppleTalk internetwork.

**DDR**

dial-on-demand routing. Technique whereby a router can automatically initiate and close a circuit-switched session as transmitting stations demand. The router spoofs keepalives so that end stations treat the session as active. DDR permits routing over ISDN or telephone lines using an external ISDN terminal adaptor or modem.

**DE**

discard eligible. See *tagged traffic*.

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**deadlock**

1. Unresolved contention for the use of a resource.
2. In APPN, when two elements of a process each wait for action by or a response from the other before they resume the process.

**decibels**

Abbreviated *dB*.

**DECnet**

Group of communications products (including a protocol suite) developed and supported by Digital Equipment Corporation. DECnet/OSI (also called *DECnet Phase V*) is the most recent iteration and supports both OSI protocols and proprietary Digital protocols. Phase IV Prime supports inherent MAC addresses that allow DECnet nodes to coexist with systems running other protocols that have MAC address restrictions. See also *DNA*.

**DECnet routing**

Proprietary routing scheme introduced by Digital Equipment Corporation in DECnet Phase III. In DECnet Phase V, DECnet completed its transition to OSI routing protocols (ES-IS and IS-IS).

**decryption**

Reverse application of an encryption algorithm to encrypted data, thereby restoring that data to its original, unencrypted state. See also *encryption*.

**dedicated LAN**

Network segment allocated to a single device. Used in LAN switched network topologies.

**dedicated line**

Communications line that is indefinitely reserved for transmissions, rather than switched as transmission is required. See also *leased line*.

**de facto standard**

Standard that exists by nature of its widespread use. Compare with *de jure standard*. See also *standard*.

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**default route**

Routing table entry that is used to direct frames for which a next hop is not explicitly listed in the routing table.

**Defense Advanced Research Projects Agency**

See *DARPA*.

**Defense Communications Agency**

See *dBm*.

**Defense Data Network**

See *DDN*.

**Defense Information Systems Agency**

See *DISA*.

**Defense Intelligence Agency**

See *DIA*.

**de jure standard**

Standard that exists because of its approval by an official standards body. Compare with *de facto standard*. See also *standard*.

**DEK**

data encryption key. Used for the encryption of message text and for the computation of message integrity checks (signatures).

**delay**

Time between the initiation of a transaction by a sender and the first response received by the sender. Also, the time required to move a packet from source to destination over a given path.

**demand priority**

Media access method used in 100VG-AnyLAN that uses a hub that can handle multiple transmission requests and can process traffic according to priority, making it useful for servicing time-sensitive traffic such as multimedia and video. Demand priority eliminates the overhead of packet collisions, collision recovery, and broadcast traffic typical in Ethernet networks. See also *100VG-AnyLAN*.

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**demarc**

Demarcation point between carrier equipment and CPE.

**demodulation**

Process of returning a modulated signal to its original form. Modems perform demodulation by taking an analog signal and returning it to its original (digital) form. See also *modulation*.

**demultiplexing**

Separating of multiple input streams that were multiplexed into a common physical signal back into multiple output streams. See also *multiplexing*.

**dense mode PIM**

See *PIM dense mode*.

**Department of Defense**

See *DoD*.

**DoD Intelligence Information System Network Security for Information Exchange**

See *DNSIX*.

**Dependent LU**

See *DLU*.

**Dependent LU Requester**

See *DLUR*.

**Dependent LU Server**

See *DLUS*.

**DES**

1. Data Encryption Standard. Standard cryptographic algorithm developed by the U.S. National Bureau of Standards.
2. destination end station.

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**designated bridge**

Bridge that incurs the lowest path cost when forwarding a frame from a segment to the root bridge.

**designated router**

OSPF router that generates LSAs for a multiaccess network and has other special responsibilities in running OSPF. Each multiaccess OSPF network that has at least two attached routers has a designated router that is elected by the OSPF Hello protocol. The designated router enables a reduction in the number of adjacencies required on a multiaccess network, which in turn reduces the amount of routing protocol traffic and the size of the topological database.

**destination address**

Address of a network device that is receiving data. See also *source address*.

**destination MAC**

See *DMAC*.

**destination service access point**

See *DSAP*.

**deterministic load distribution**

Technique for distributing traffic between two bridges across a circuit group. Guarantees packet ordering between source-destination pairs and always forwards traffic for a source-destination pair on the same segment in a circuit group for a given circuit-group configuration.

**Deutsche Industrie Norm**

See *DIN*.

**Deutsche Industrie Norm connector**

See *DIN connector*.

**device**

See *node*.



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**DHCP**

Dynamic Host Configuration Protocol. Provides a mechanism for allocating IP addresses dynamically so that addresses can be reused when hosts no longer need them.

**DIA**

Document Interchange Architecture. Defines the protocols and data formats needed for the transparent interchange of documents in an SNA network. One of three SNA transaction services. See also *DDM* and *SNADS*.

**dial backup**

Feature that provides protection against WAN downtime by allowing the network administrator to configure a backup serial line through a circuit-switched connection.

**dial-on-demand routing**

See *DDR*.

**dial-up line**

Communications circuit that is established by a switched-circuit connection using the telephone company network.

**differential encoding**

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

**differential Manchester encoding**

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

**Diffusing Update Algorithm**

See *DUAL* in the “Cisco Systems Terms and Acronyms” section.

**Digital Network Architecture**

See *DNA*.

**digital signal level 0**

See *DS-0*.

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**digital signal level 1**

See *DS-1*.

**digital signal level 3**

See *DS-3*.

**Dijkstra's algorithm**

See *SPF*.

**DIN**

Deutsche Industrie Norm. German national standards organization.

**DIN connector**

Deutsche Industrie Norm connector. Multipin connector used in some Macintosh and IBM PC-compatible computers, and on some network processor panels.

**directed search**

Search request sent to a specific node known to contain a resource. A directed search is used to determine the continued existence of the resource and to obtain routing information specific to the node. See also *broadcast search*.

**directed tree**

Logical construct used to define data streams or flows. The origin of a data stream is the root. Data streams are unidirectional branches directed away from the root and toward targets, and targets are the leaves of the directed tree.

**direct memory access**

See *DMA*.

**directory services**

Services that help network devices locate service providers.

**DISA**

Defense Information Systems Agency. Formerly DCA. U.S. military organization responsible for implementing and operating military information systems, including the DDN. See also *DDN* and *dBm*.

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**discard eligible**

See *DE*.

**discovery architecture**

APPN software that enables a machine configured as an APPN EN to automatically find primary and backup NNs when the machine is brought onto an APPN network.

**discovery mode**

Method by which an AppleTalk interface acquires information about an attached network from an operational node and then uses this information to configure itself. Also called dynamic configuration.

**Distance Vector Multicast Routing Protocol**

See *DVMRP*.

**distance vector routing algorithm**

Class of routing algorithms that iterate on the number of hops in a route to find a shortest-path spanning tree. Distance vector routing algorithms call for each router to send its entire routing table in each update, but only to its neighbors. Distance vector routing algorithms can be prone to routing loops, but are computationally simpler than link state routing algorithms. Also called *Bellman-Ford routing algorithm*. See also *link-state routing algorithm* and *SPF*.

**distortion delay**

Problem with a communication signal resulting from nonuniform transmission speeds of the components of a signal through a transmission medium. Also called *group delay*.

**distributed computing (processing)**

See *client/server computing*.

**Distributed Data Management**

See *DDM*.

**Distributed Queue Dual Bus**

See *DQDB*.

**Distributed Relational Database Architecture**

See *DRDA*.

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**DIT**

Directory Information Tree. Global tree of entries corresponding to information objects in the OSI X.500 Directory.

**DLCI**

data-link connection identifier. Value that specifies a PVC or SVC in a Frame Relay network. In the basic Frame Relay specification, DLCIs are locally significant (connected devices might use different values to specify the same connection). In the LMI extended specification, DLCIs are globally significant (DLCIs specify individual end devices). See also *LMI*.

**DLL**

dynamic link library.

**DLSw**

data-link switching. Interoperability standard, described in RFC 1434, that provides a method for forwarding SNA and NetBIOS traffic over TCP/IP networks using data-link layer switching and encapsulation. DLSw uses SSP instead of SRB, eliminating the major limitations of SRB, including hop-count limits, broadcast and unnecessary traffic, timeouts, lack of flow control, and lack of prioritization schemes. See also *SRB* and *SSP* (Switch-to-Switch Protocol).

**DLSw+**

See *DLSw+* (data-link switching plus) in the “Cisco Systems Terms and Acronyms” section.

**DLU**

Dependent LU. LU that depends on the SSCP to provide services for establishing sessions with other LUs. See also *LU* and *SSCP*.

**DLUR**

Dependent LU Requester. Client half of the Dependent LU Requestor/Server enhancement to APPN. The DLUR component resides in APPN ENs and NNs that support adjacent DLUs by securing services from the DLUS. See also *APPN*, *DLU*, and *DLUS*.

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**DLUR node**

In APPN networks, an EN or NN that implements the DLUR component. See also *DLUR*.

**DLUS**

Dependent LU Server. Server half of the Dependent LU Requestor/Server enhancement to APPN. The DLUS component provides SSCP services to DLUR nodes over an APPN network. See also *APPN*, *DLU*, and *DLUR*.

**DLUS node**

In APPN networks, a NN that implements the DLUS component. See also *DLUS*.

**DMA**

direct memory access. Transfer of data from a peripheral device, such as a hard disk drive, into memory without that data passing through the microprocessor. DMA transfers data into memory at high speeds with no processor overhead.

**DMAC**

destination MAC. The MAC address specified in the Destination Address field of a packet. Compare with *SMAC*. See also *MAC address*.

**DMP**

See *DMP* (Data movement processor) in the “Cisco Systems Terms and Acronyms” section.

**DN**

Distinguished Name. Global, authoritative name of an entry in the OSI Directory (X.500).

**DNA**

Digital Network Architecture. Network architecture developed by Digital Equipment Corporation. The products that embody DNA (including communications protocols) are collectively referred to as DECnet. See also *DECnet*.

**DNIC**

Data Network Identification Code. Part of an X.121 address. DNICs are divided into two parts: the first specifying the country in which the addressed PSN is located and the second specifying the PSN itself. See also *X.121*.

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**DNS**

Domain Name System. System used in the Internet for translating names of network nodes into addresses. See also *authority zone*.

**DNSIX**

Department of Defense Intelligence Information System Network Security for Information Exchange. Collection of security requirements for networking defined by the U.S. Defense Intelligence Agency.

**DOCSIS**

Data-over-Cable Service Interface Specifications. Defines technical specifications for equipment at both subscriber locations and cable operators' headends. Adoption of DOCSIS will accelerate deployment of data-over-cable services and ensure interoperability of equipment throughout system operators' infrastructures.

**Document Interchange Architecture**

See *DIA*.

**DoD**

Department of Defense. U.S. government organization that is responsible for national defense. The DoD has frequently funded communication protocol development.

**domain**

1. In the Internet, a portion of the naming hierarchy tree that refers to general groupings of networks based on organization-type or geography.
2. In SNA, an SSCP and the resources it controls.
3. In IS-IS, a logical set of networks.

**Domain**

Networking system developed by Apollo Computer (now part of Hewlett-Packard) for use in its engineering workstations.

**Domain Name System**

See *DNS*.

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**domain specific part**

See *DSP*.

**dot address**

Refers to the common notation for IP addresses in the form *n.n.n.n* where each number *n* represents, in decimal, 1 byte of the 4-byte IP address. Also called *dotted notation* and *four-part dotted notation*.

**dotted decimal notation**

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. Also called *dotted quad notation*.

**dotted notation**

See *dot address*.

**downlink station**

See *ground station*.

**downstream physical unit**

See *DSPU*.

**DQDB**

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

**DRAM**

dynamic random-access memory. RAM that stores information in capacitors that must be periodically refreshed. Delays can occur because DRAMs are inaccessible to the processor when refreshing their contents. However, DRAMs are less complex and have greater capacity than SRAMs. See also *SRAM*.

**DRDA**

Distributed Relational Database Architecture. IBM proprietary architecture.

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**drop**

Point on a multipoint channel where a connection to a networked device is made.

**drop cable**

Cable that connects a network device (such as a computer) to a physical medium. A type of AUI. See also *AUI*.

**DRP**

See *DRP* (Director Response Protocol) in the “Cisco Systems Terms and Acronyms” section.

**DS-0**

digital signal level 0. Framing specification used in transmitting digital signals over a single channel at 64-kbps on a T1 facility. Compare with *DS-1* and *DS-3*.

**DS-1**

digital signal level. Framing specification used in transmitting digital signals at 1.544-Mbps on a T1 facility (in the United States) or at 2.108-Mbps on an E1 facility (in Europe). Compare with *DS-0* and *DS-3*. See also *E1* and *T1*.

**DS-1 domestic trunk interface**

See *DS-1/DTI*.

**DS-1/DTI**

DS-1 domestic trunk interface. Interface circuit used for DS-1 applications with 24 trunks.

**DS-3**

digital signal level 3. Framing specification used for transmitting digital signals at 44.736 Mbps on a T3 facility. Compare with *DS-0* and *DS-1*. See also *E3* and *T.120*.

**DSA**

Directory System Agent. 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.



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**DSAP**

destination service access point. *SAP* of the network node designated in the Destination field of a packet. Compare with *SSAP*. See also *SAP* (service access point).

**DSL**

digital subscriber line. Public network technology that delivers high bandwidth over conventional copper wiring at limited distances. There are four types of DSL: ADSL, HDSL, SDSL, and VDSL. All are provisioned via modem pairs, with one modem located at a central office and the other at the customer site. Because most DSL technologies do not use the whole bandwidth of the twisted pair, there is room remaining for a voice channel. See also *ADSL*, *HDSL*, *SDSL*, and *VDSL*.

**DSP**

domain specific part. Part of an NSAP-format ATM address that contains an area identifier, a station identifier, and a selector byte. See also *NSAP*.

**DSPU**

downstream physical unit. In SNA, a PU that is located downstream from the host. See also *DSPU concentration* in the “Cisco Systems Terms and Acronyms” section.

**DSPU concentration**

See *DSPU concentration* in the “Cisco Systems Terms and Acronyms” section.

**DSR**

data set ready. EIA/TIA-232 interface circuit that is activated when DCE is powered up and ready for use.

**DSU**

data service unit. Device used in digital transmission that adapts the physical interface on a DTE device to a transmission facility such as T1 or E1. The DSU is also responsible for such functions as signal timing. Often referred to together with CSU, as *CSU/DSU*. See also *CSU*.

**DSX-1**

Crossconnection point for DS-1 signals.

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**DTE**

data terminal equipment. Device at the user end of a user-network interface that serves as a data source, destination, or both. DTE connects to a data network through a DCE device (for example, a modem) and typically uses clocking signals generated by the DCE. DTE includes such devices as computers, protocol translators, and multiplexers. Compare with *DCE*.

**DTL**

designated transit list. List of nodes and optional link IDs that completely specify a path across a single PNNI peer group.

**DTMF**

dual tone multifrequency. Use of two simultaneous voice-band tones for dialing (such as touch tone).

**DTR**

data terminal ready. EIA/TIA-232 circuit that is activated to let the DCE know when the DTE is ready to send and receive data.

**DUA**

Directory User Agent. Software that accesses the X.500 Directory Service on behalf of the directory user. The directory user can be a person or another software element.

**DUAL**

See *DUAL* (Diffusing update algorithm) in the “Cisco Systems Terms and Acronyms” section.

**dual-attached concentrator**

See *DAC*.

**dual attachment station**

See *DAS*.

**dual counter-rotating rings**

Network topology in which two signal paths, whose directions are opposite each other, exist in a token-passing network. FDDI and CDDI are based on this concept.

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**dual-homed station**

Device attached to multiple FDDI rings to provide redundancy.

**dual homing**

Network topology in which a device is connected to the network by way of two independent access points (points of attachment). One access point is the primary connection, and the other is a standby connection that is activated in the event of a failure of the primary connection.

**Dual IS-IS**

See *Integrated IS-IS*.

**dual tone multifrequency**

See *DTMF*.

**DVMRP**

Distance Vector Multicast Routing Protocol. Internetwork gateway protocol, largely based on RIP, that implements a typical dense mode IP multicast scheme. DVMRP uses IGMP to exchange routing datagrams with its neighbors. See also *IGMP*.

**DXI**

Data Exchange Interface. ATM Forum specification, described in RFC 1483, that defines how a network device such as a bridge, router, or hub can effectively act as an FEP to an ATM network by interfacing with a special DSU that performs packet segmentation and reassembly.

**dynamic adaptive routing**

Automatic rerouting of traffic based on a sensing and analysis of current actual network conditions, not including cases of routing decisions taken on predefined information.

**dynamic address resolution**

Use of an address resolution protocol to determine and store address information on demand.

**Dynamic Buffer Management**

Frame Relay and ATM service modules are equipped with large buffers and the patented Dynamic Buffer Management scheme for allocating and scaling traffic entering or leaving a node on a per-VC basis. The WAN switch dynamically assigns buffers to

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individual virtual circuits based upon the amount of traffic present and service-level agreements. This deep pool of available buffers readily accommodates large bursts of traffic into the node.

**dynamic configuration**

See *discovery mode*.

**Dynamic IISP**

Dynamic Interim-Interswitch Signaling Protocol. Basic call routing protocol that automatically reroutes ATM connections in the event of link failures. Dynamic IISP is an interim solution until PNNI Phase 1 is completed. Contrast with *IISP*.

**dynamic random-access memory**

See *DRAM*.

**dynamic routing**

Routing that adjusts automatically to network topology or traffic changes. Also called adaptive routing.

# E

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**E&M**

recEive and transMit (or ear and mouth). Trunking arrangement generally used for two-way switch-to-switch or switch-to-network connections. Cisco's analog E&M interface is an RJ-48 connector that allows connections to PBX trunk lines (tie lines). E&M is also available on E1 and T1 digital interfaces.

**E1**

Wide-area digital transmission scheme used predominantly in Europe that carries data at a rate of 2.048 Mbps. E1 lines can be leased for private use from common carriers. Compare with *T1*. See also *DS-1*.

**E.164**

1. ITU-T recommendation for international telecommunication numbering, especially in ISDN, BISDN, and SMDS. An evolution of standard telephone numbers.
2. Name of the field in an ATM address that contains numbers in E.164 format.

**E2A**

Legacy protocols for providing OAM&P functions between a network element and an operations support system. See also *OAM&P*.

**E3**

Wide-area digital transmission scheme used predominantly in Europe that carries data at a rate of 34.368 Mbps. E3 lines can be leased for private use from common carriers. Compare with *T.120*. See also *DS-3*.

**early packet discard**

See *EPD*.

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**early token release**

Technique used in Token Ring networks that allows a station to release a new token onto the ring immediately after transmitting, instead of waiting for the first frame to return. This feature can increase the total bandwidth on the ring. See also *Token Ring*.

**EARN**

European Academic Research Network. European network connecting universities and research institutes. EARN merged with RARE to form TERENA. See also *RARE* and *TERENA*.

**EBCDIC**

extended binary coded decimal interchange code. Any of a number of coded character sets developed by IBM consisting of 8-bit coded characters. This character code is used by older IBM systems and telex machines. Compare with *ASCII*.

**EBONE**

European Backbone. Pan-European network backbone service.

**E channel**

echo channel. 64-kbps ISDN circuit-switching control channel. The E channel was defined in the 1984 ITU-T ISDN specification, but was dropped in the 1988 specification. Compare with *B channel*, *D channel*, and *H channel*.

**EC**

European Community.

**echo channel**

See *E channel*.

**echoplex**

Mode in which keyboard characters are echoed on a terminal screen upon return of a signal from the other end of the line indicating that the characters were received correctly.

**ECMA**

European Computer Manufacturers Association. Group of European computer vendors who have done substantial OSI standardization work.

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**edge device**

1. Physical device that is capable of forwarding packets between legacy interfaces (such as Ethernet and Token Ring) and ATM interfaces based on data-link and network layer information. An edge device does not participate in the running of any network layer routing protocol, but it obtains forwarding descriptions using the route distribution protocol.

2. Any device that is not an ATM switch that can connect to an ATM switch.

**EDI**

electronic data interchange. Electronic communication of operational data such as orders and invoices between organizations.

**EDIFACT**

Electronic Data Interchange for Administration, Commerce, and Transport. Data exchange standard administered by the United Nations to be a multi-industry EDI standard.

**EECM**

end-to-end call manager.

**EEPROM**

electrically erasable programmable read-only memory. EPROM that can be erased using electrical signals applied to specific pins. See also *EPROM*.

**EFCI**

Explicit Forward Congestion Indication. In ATM, one of the congestion feedback modes allowed by ABR service. A network element in an impending congestion state or in a congested state can set the EFCI. The destination end-system can implement a protocol that adaptively lowers the cell rate of the connection based on the value of the EFCI. See also *ABR*.

**EFF**

Electronic Frontier Foundation. Foundation established to address social and legal issues arising from the impact on society of the increasingly pervasive use of computers as the means of communication and information distribution.

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**EGP**

Exterior Gateway Protocol. Internet protocol for exchanging routing information between autonomous systems. Documented in RFC 904. Not to be confused with the general term *exterior gateway protocol*. EGP is an obsolete protocol that was replaced by BGP. See also *BGP*.

**EIA**

Electronic Industries Association. Group that specifies electrical transmission standards. The EIA and TIA have developed numerous well-known communications standards, including EIA/TIA-232 and EIA/TIA-449. See also *TIA*.

**EIA-530**

Refers to two electrical implementations of EIA/TIA-449: RS-422 (for balanced transmission) and RS-423 (for unbalanced transmission). See also *RS-422*, *RS-423*, and *EIA/TIA-449*.

**EIA/TIA-232**

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

**EIA/TIA-449**

Popular physical layer interface developed by EIA and TIA. Essentially, a faster (up to 2 Mbps) version of EIA/TIA-232 capable of longer cable runs. Formerly called *RS-449*. See also *EIA-530*.

**EIA/TIA-586**

Standard that describes the characteristics and applications for various grades of UTP cabling. See also *Category 1 cabling*, *Category 2 cabling*, *Category 3 cabling*, *Category 4 cabling*, *Category 5 cabling*, and *UTC*.

**EIGRP**

See *Enhanced IGRP* in the “Cisco Systems Terms and Acronyms” section.

**EIP**

See *EIP* (Ethernet Interface Processor) in the “Cisco Systems Terms and Acronyms” section.



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**EISA**

Extended Industry-Standard Architecture. 32-bit bus interface used in PCs, PC-based servers, and some UNIX workstations and servers. See also *ISA*.

**ELAN**

emulated LAN. ATM network in which an Ethernet or Token Ring LAN is emulated using a client-server model. ELANs are composed of an LEC, an LES, a BUS, and an LECS. Multiple ELANs can exist simultaneously on a single ATM network. ELANs are defined by the LANE specification. See also *BUS*, *LANE*, *LEC*, *LECS*, and *LES*.

**ELAP**

EtherTalk Link Access Protocol. Link-access protocol used in an EtherTalk network. ELAP is built on top of the standard Ethernet data link layer.

**electromagnetic interference**

See *EMI*.

**electromagnetic pulse**

See *EMP*.

**electrically erasable programmable read-only memory**

See *EECM*.

**electronic data interchange**

See *EDI*.

**Electronic Data Interchange for Administration, Commerce, and Transport**

See *EDIFACT*.

**Electronic Frontier Foundation**

See *EFF*.

**Electronic Industries Association**

See *EIA*.

**electronic mail**

See *e-mail*.

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**Electronic Messaging Association**

See *EMA*.

**electrostatic discharge**

See *ESD*.

**ELMI**

Enhanced Local Management Interface.

**EMA**

1. Enterprise Management Architecture. Digital Equipment Corporation network management architecture, based on the OSI network management model.
2. Electronic Messaging Association. Forum devoted to standards and policy work, education, and development of electronic messaging systems such as e-mail, voice mail, and facsimile.

**e-mail**

electronic mail. Widely used network application in which text messages are transmitted electronically between end users over various types of networks using various network protocols.

**EMI**

electromagnetic interference. Interference by electromagnetic signals that can cause reduced data integrity and increased error rates on transmission channels.

**EMIF**

ESCON Multiple Image Facility. Mainframe I/O software function that allows one ESCON channel to be shared among multiple logical partitions on the same mainframe. See also *ESCON*.

**EMP**

electromagnetic pulse. Caused by lightning and other high-energy phenomena. Capable of coupling enough energy into unshielded conductors to destroy electronic devices. See also *Tempest*.

**emulated LAN**

See *ELAN*.

---

**emulation mode**

Function of an NCP that enables it to perform activities equivalent to those performed by a transmission control unit.

**EN**

end node. APPN end system that implements the PU 2.1, provides end-user services, and supports sessions between local and remote CPs. ENs are not capable of routing traffic and rely on an adjacent NN for APPN services. Compare with *NN*. See also *CP*.

**encapsulation**

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

**encapsulation bridging**

Carries Ethernet frames from one router to another across disparate media, such as serial and FDDI lines. Contrast with *translational bridging*.

**encoder**

Device that modifies information into the required transmission format.

**encryption**

Application of a specific algorithm to data so as to alter the appearance of the data making it incomprehensible to those who are not authorized to see the information. See also *decryption*.

**end node**

See *EN*.

**end of transmission**

See *EOT*.

**endpoint**

H.323 terminal or gateway. An endpoint can call and be called. It generates and terminates the information stream.

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**end point**

Device at which a virtual circuit or virtual path begins or ends.

**end system**

See *ES*.

**End System-to-Intermediate System**

See *ES-IS*.

**Energy Sciences Network**

See *ESnet*.

**Enhanced IGRP**

See *Enhanced IGRP* in the “Cisco Systems Terms and Acronyms” section.

**Enhanced Interior Gateway Routing Protocol**

See *Enhanced IGRP* in the “Cisco Systems Terms and Acronyms” section.

**Enhanced Monitoring Services**

See *Enhanced Monitoring Services* in the “Cisco Systems Terms and Acronyms” section.

**Enterprise Management Architecture**

See *EMA*.

**enterprise network**

Large and diverse network connecting most major points in a company or other organization. Differs from a WAN in that it is privately owned and maintained.

**Enterprise System Connection**

See *ESCON*.

**Enterprise System Connection channel**

See *ESCON channel*.

**entity**

Generally, an individual, manageable network device. Sometimes called an alias.

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**entity identifier**

The unique address of an NVE's socket in a node on an AppleTalk network. The specific format of an entity identifier is network-dependent. See also *NVE*.

**entity name**

Name that an NVE can assign to itself. Although not all NVEs have names, NVEs can possess several names (or aliases). An entity name is made up of three character strings: object, entity type, and zone. For example: Bldg 2 LaserJet 5:LaserWriter@Bldg 2 Zone. See also *NVE*.

**entity type**

Part of an entity name that describes the entity's class. For example, LaserWriter or AFPServer. See also *entity name*.

**EOM**

end of message. Indicator that identifies the last ATM cell containing information from a data packet that was segmented.

**EOT**

end of transmission. Generally, a character that signifies the end of a logical group of characters or bits.

**EPD**

early packet discard. Mechanism used by some ATM switches for discarding a complete AAL5 frame when a threshold condition, such as imminent congestion, is met. EPD prevents congestion that would otherwise jeopardize the switch's ability to properly support existing connections with a guaranteed service. Compare with *TPD*.

**EPROM**

erasable programmable read-only memory. Nonvolatile memory chips that are programmed after they are manufactured, and, if necessary, can be erased by some means and reprogrammed. Compare with *EECM* and *PROM*.

**equalization**

Technique used to compensate for communications channel distortions.

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**ER**

explicit rate. In ATM, an RM cell used to limit the ACR for a transmission to a specific value. Usually the source initially sets the ER initially to a requested rate, such as the PCR. Later, any network element in the path can reduce the ER to a value that the element can sustain. See also *ACOM*, *PCR*, and *RLM*.

**erasable programmable read-only memory**

See *EPROM*.

**error control**

Technique for detecting and correcting errors in data transmissions.

**error-correcting code**

Code having sufficient intelligence and incorporating sufficient signaling information to enable the detection and correction of many errors at the receiver.

**error-detecting code**

Code that can detect transmission errors through analysis of received data based on the adherence of the data to appropriate structural guidelines.

**ES**

1. end system. Generally, an end-user device on a network.
2. end system. Nonrouting host or node in an OSI network.

**ESI**

end system identifier. Identifier that distinguishes multiple nodes at the same level when the lower level peer group is partitioned (usually an IEEE 802 address).

**ESCON**

Enterprise System Connection. IBM channel architecture that specifies a pair of fiber-optic cables, with either LEDs or lasers as transmitters, and a signaling rate of 200 Mbps.

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**ESCON channel**

IBM channel for attaching mainframes to peripherals such as storage devices, backup units, and network interfaces. This channel incorporates fiber channel technology. The ESCON channel replaces the bus and tag channel. Compare with *parallel channel*. See also *bus and tag channel*.

**ESCON Multiple Image Facility**

See *EMIF*.

**ESD**

electrostatic discharge. Discharge of stored static electricity that can damage electronic equipment and impair electrical circuitry, resulting in complete or intermittent failures.

**ESF**

Extended Superframe. Framing type used on T1 circuits that consists of 24 frames of 192 bits each, with the 193rd bit providing timing and other functions. ESF is an enhanced version of SF. See also *SF*.

**ES-IS**

End System-to-Intermediate System. OSI protocol that defines how end systems (hosts) announce themselves to intermediate systems (routers). See also *IS-IS*.

**ESMTP**

Extended Simple Mail Transfer Protocol. Extended version of the Simple Mail Transfer Protocol (SMTP), which includes additional functionality such as delivery notification and session delivery. ESMTP is described in RFC 1869, SMTP Service Extensions.

**ESnet**

Energy Sciences Network. Data communications network managed and funded by the U.S. Department of Energy Office of Energy Research (DOE/OER). Interconnects the DOE to educational institutions and other research facilities.

**ESP**

Extended Services Processor.

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**ESS**

Electronic Switching System. AT&T's term for an electronic central office switch. A 5ESS is AT&T's digital central office for end office applications. A 4ESS is its digital central office for toll center application.

**Ethernet**

Baseband LAN specification invented by Xerox Corporation and developed jointly by Xerox, Intel, and Digital Equipment Corporation. Ethernet networks use CSMA/CD and run over a variety of cable types at 10 Mbps. Ethernet is similar to the IEEE 802.3 series of standards. See also *10Base2*, *10Base5*, *10BaseF*, *10BaseT*, *10Broad36*, *Fast Ethernet*, and *IEEE 802.3*.

**Ethernet Interface Processor**

See *EIP* in the "Cisco Systems Terms and Acronyms" section.

**ethernet meltdown**

Event that causes saturation, or near saturation, on an Ethernet. It usually results from illegal or misrouted packets and typically lasts only a short time.

**EtherTalk**

Apple Computer's data-link product that allows an AppleTalk network to be connected by Ethernet cable.

**EtherTalk Link Access Protocol**

See *ELAP*.

**ETSI**

European Telecommunication Standards Institute. Organization created by the European PTTs and the EC to propose telecommunications standards for Europe.

**EUnet**

European Internet. European commercial Internet service provider. EUnet is designed to provide e-mail, news, and other Internet services to European markets.

**European Academic Research Network**

See *EARN*.



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**European Computer Manufacturers Association**

See *ECMA*.

**European Telecommunication Standards Institute**

See *ETSI*.

**European Internet**

See *EUnet*.

**event**

Network message indicating operational irregularities in physical elements of a network or a response to the occurrence of a significant task, typically the completion of a request for information. See also *alarm* and *trap*.

**EWOS**

European Workshop for Open Systems. The OSI Implementors Workshop for Europe.

**Excess Burst**

See *Be*.

**excess rate**

In ATM, traffic in excess of the insured rate for a given connection. Specifically, the excess rate equals the maximum rate minus the insured rate. Excess traffic is delivered only if network resources are available and can be discarded during periods of congestion. Compare with *insured rate* and *maximum rate*.

**exchange identification**

See *XID*.

**EXEC**

See *EXEC* in the “Cisco Systems Terms and Acronyms” section.

**expansion**

The process of running a compressed data set through an algorithm that restores the data set to its original size. Compare with *companding* and *compression*.

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**expedited delivery**

Option set by a specific protocol layer telling other protocol layers (or the same protocol layer in another network device) to handle specific data more rapidly.

**explicit route**

In SNA, a route from a source subarea to a destination subarea, as specified by a list of subarea nodes and transmission groups that connect the two.

**explicit forward congestion indication**

See *EFCI*.

**explicit rate**

See *ER*.

**explorer frame**

Frame sent out by a networked device in a SRB environment to determine the optimal route to another networked device.

**explorer packet**

Generated by an end station trying to find its way through a SRB network. Gathers a hop-by-hop description of a path through the network by being marked (updated) by each bridge that it traverses, thereby creating a complete topological map. See also *all-routes explorer packet*, *local explorer packet*, and *spanning explorer packet*.

**Extended Binary Coded Decimal Interchange Code**

See *EBCDIC*.

**Extended Industry-Standard Architecture**

See *EISA*.

**Extended Services Processor**

See *ESP* in the “Cisco Systems Terms and Acronyms” section.

**Extended Superframe Format**

See *ESF*.

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**exterior gateway protocol**

Any internetwork protocol used to exchange routing information between autonomous systems. Not to be confused with Exterior Gateway Protocol (EGP), which is a particular instance of an exterior gateway protocol.

**Exterior Gateway Protocol**

See *EGP*.

**exterior router**

Router connected to an AURP tunnel, responsible for the encapsulation and deencapsulation of AppleTalk packets in a foreign protocol header (for example, IP). See also *AURP* and *AURP tunnel*.

**EXZ**

excessive zeros.



# F

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**failure domain**

Area in which a failure occurred in a Token Ring, defined by the information contained in a beacon. When a station detects a serious problem with the network (such as a cable break), it sends a beacon frame that includes the station reporting the failure, its NAUN, and everything in between. Beacons in turn initiate a process called autoreconfiguration. See also *autoreconfiguration*, *beacon*, and *NAUN*.

**fallback**

Mechanism used by ATM networks when rigorous path selection does not generate an acceptable path. The fallback mechanism attempts to determine a path by selectively relaxing certain attributes, such as delay, in order to find a path that meets some minimal set of desired attributes.

**fan-out unit**

Device that allows multiple devices on a network to communicate using a single network attachment.

**fantail**

Panel of I/O connectors that attaches to an equipment rack, providing easy access for data connections to a networking.

**FAQ**

frequently asked questions. Usually appears in the form of a “read-me” file in a variety of Internet forums. New users are expected to read the FAQ before participating in newsgroups, bulletin boards, video conferences, and so on.

**FARNET**

Federation of American Research NETworks.

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**Fast Ethernet**

Any of a number of 100-Mbps Ethernet specifications. Fast Ethernet offers a speed increase ten times that of the 10BaseT Ethernet specification, while preserving such qualities as frame format, MAC mechanisms, and MTU. Such similarities allow the use of existing 10BaseT applications and network management tools on Fast Ethernet networks. Based on an extension to the IEEE 802.3 specification. Compare with *Ethernet*. See also *100BaseFX*, *100BaseT*, *100BaseT4*, *100BaseTX*, *100BaseX*, and *IEEE 802.3*.

**Fast Ethernet Interface Processor**

See *FEIP* in the “Cisco Systems Terms and Acronyms” section.

**Fast Sequenced Transport**

See *FST* in the “Cisco Systems Terms and Acronyms” section.

**Fast Serial Interface Processor**

See *FSIP* in the “Cisco Systems Terms and Acronyms” section.

**fast switching**

See *fast switching* in the “Cisco Systems Terms and Acronyms” section.

**fault management**

One of five categories of network management defined by ISO for management of OSI networks. Fault management attempts to ensure that network faults are detected and controlled. See also *accounting management*, *configuration management*, *performance management*, and *security management*.

**FCC**

Federal Communications Commission. U.S. government agency that supervises, licenses, and controls electronic and electromagnetic transmission standards.

**FCFS**

first come first served.

**FCS**

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

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**FDDI**

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

**FDDI II**

ANSI standard that enhances FDDI. FDDI II provides isochronous transmission for connectionless data circuits and connection-oriented voice and video circuits. Compare with *FDDI*.

**FDDI Interface Processor**

See *FIP* in the “Cisco Systems Terms and Acronyms” section.

**FDDITalk**

Apple Computer’s data-link product that allows an AppleTalk network to be connected by FDDI cable.

**FDM**

frequency-division multiplexing. Technique whereby information from multiple channels can be allocated bandwidth on a single wire based on frequency. Compare with *ATDM*, *statistical multiplexing*, and *TDM*.

**FE**

Fast Ethernet.

**FECN**

forward explicit congestion notification. Bit set by a Frame Relay network to inform DTE receiving the frame that congestion was experienced in the path from source to destination. DTE receiving frames with the FECN bit set can request that higher-level protocols take flow-control action as appropriate. Compare with *BECN*.

**Federal Communications Commission**

See *FCC*.

**Federal Networking Council**

See *FNC*.

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**FEIP**

See *FEIP* (Fast Ethernet Interface Processor) in the “Cisco Systems Terms and Acronyms” section.

**FEP**

front-end processor. Device or board that provides network interface capabilities for a networked device. In SNA, typically an IBM 3745 device.

**FGD**

Feature Group-D.

**Fiber Distributed Data Interface**

See *FDDI*.

**fiber-optic cable**

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

**fiber-optic interrepeater link**

See *FOIRL*.

**FID0**

format indicator 0. One of several formats that an SNA TH can use. An FID0 TH is used for communication between an SNA node and a non-SNA node. See also *TH*.

**FID1**

format indicator. One of several formats that an SNA TH can use. An FID1 TH encapsulates messages between two subarea nodes that do not support virtual and explicit routes. See also *TH*.

**FID2**

format indicator 2. One of several formats that an SNA TH can use. An FID2 TH is used for transferring messages between a subarea node and a PU 2, using local addresses. See also *TH*.



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**FID3**

format indicator 3. One of several formats that an SNA TH can use. An FID3 TH is used for transferring messages between a subarea node and a PU 1, using local addresses. See also *TH*.

**FID4**

format indicator 4. One of several formats that an SNA TH can use. An FID4 TH encapsulates messages between two subarea nodes that are capable of supporting virtual and explicit routes. See also *TH*.

**field replaceable unit**

Hardware component that can be removed and replaced on-site. Typical field-replaceable units include cards, power supplies, and chassis components.

**file transfer**

Category of popular network applications that allow files to be moved from one network device to another.

**File Transfer, Access, and Management**

See *FTAM*.

**File Transfer Protocol**

See *FTP*.

**filter**

Generally, a process or device that screens network traffic for certain characteristics, such as source address, destination address, or protocol, and determines whether to forward or discard that traffic based on the established criteria.

**finger**

Software tool for determining whether a person has an account at a particular Internet site. Many sites do not allow incoming finger requests.

**FIP**

See *FIP* (FDDI Interface Processor) in the “Cisco Systems Terms and Acronyms” section.

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**firewall**

Router or access server, or several routers or access servers, designated as a buffer between any connected public networks and a private network. A firewall router uses access lists and other methods to ensure the security of the private network.

**firmware**

Software instructions set permanently or semipermanently in ROM.

**FIX**

Federal Internet Exchange. Connection point between the North American governmental internets and the Internet. The FIXs are named after their geographic region, as in FIX West (Mountain View, California) and FIX East (College Park, Maryland). See *CIX*, *GIX*, and *MAE*.

**flapping**

Routing problem where an advertised route between two nodes alternates (flaps) back and forth between two paths due to a network problem that causes intermittent interface failures.

**Flash memory**

Nonvolatile storage that can be electrically erased and reprogrammed so that software images can be stored, booted, and rewritten as necessary. Flash memory was developed by Intel and is licensed to other semiconductor companies.

**flash update**

Routing update sent asynchronously in response to a change in the network topology. Compare with *routing update*.

**flat addressing**

Scheme of addressing that does not use a logical hierarchy to determine location. For example, MAC addresses are flat, so bridging protocols must flood packets throughout the network in order to deliver the packet to the appropriate location. Compare with *hierarchical addressing*.

**F-link**

SS7 fully associated link. An SS7 signaling link directly associated with a link carrying traffic.

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**flooding**

Traffic passing technique used by switches and bridges in which traffic received on an interface is sent out all of the interfaces of that device except the interface on which the information was originally received.

**flow**

Stream of data traveling between two endpoints across a network (for example, from one LAN station to another). Multiple flows can be transmitted on a single circuit.

**flow control**

Technique for ensuring that a transmitting entity, such as a modem, does not overwhelm a receiving entity with data. When the buffers on the receiving device are full, a message is sent to the sending device to suspend the transmission until the data in the buffers has been processed. In IBM networks, this technique is called pacing.

**flowspec**

In IPv6, the traffic parameters of a stream of IP packets between two applications. See also *IPv6*.

**FLT**

Full Line Terminal. Multiplexer that terminates a SONET span. See also *SONET*.

**FM**

frequency modulation. Modulation technique in which signals of different frequencies represent different data values. Compare with *AM* and *PAM*. See also *modulation*.

**FNC**

Federal Networking Council. Group responsible for assessing and coordinating U.S. federal agency networking policies and needs.

**FOIRL**

fiber-optic interrepeater link. Fiber-optic signaling methodology based on the IEEE 802.3 fiber-optic specification. FOIRL is a precursor of the 10BaseFL specification, which is designed to replace it. See also *10BaseFL*.

**format indicator 0**

See *FIDO*.

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**format indicator 1**

See *FID1*.

**format indicator 2**

See *FID2*.

**format indicator 3**

See *FID3*.

**format indicator 4**

See *FID4*.

**forward channel**

Communications path carrying information from the call initiator to the called party.

**forward delay interval**

Amount of time an interface spends listening for topology change information after that interface is activated for bridging and before forwarding actually begins.

**forward explicit congestion notification**

See *FE*.

**forwarding**

Process of sending a frame toward its ultimate destination by way of an internetworking device.

**FOTS**

Fiber Optics Transmission Systems. Vendor-proprietary fiber-optic transmission equipment.

**Fourier transform**

Technique used to evaluate the importance of various frequency cycles in a time series pattern.

**four-part dotted notation**

See *dot address*.

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**FQDN**

fully qualified domain name. FQDN is the full name of a system, rather than just its host name. For example, *aldebaran* is a host name, and *aldebaran.interop.com* is an FQDN.

**fractional T1**

See *channelized T1*.

**FRAD**

Frame Relay access device. Any network device that provides a connection between a LAN and a Frame Relay WAN. See also *Cisco FRAD* (Cisco Frame Relay access device) and *FRAS* (Frame Relay access support) in the “Cisco Systems Terms and Acronyms” section.

**fragment**

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

**fragmentation**

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

**frame**

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

**frame check sequence**

See *FCFS*.

**frame forwarding**

Mechanism by which frame-based traffic, such as *HDLC* and *SDLC*, traverses an ATM network.

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**Frame Relay**

Industry-standard, switched data link layer protocol that handles multiple virtual circuits using HDLC encapsulation between connected devices. Frame Relay is more efficient than X.25, the protocol for which it is generally considered a replacement. See also X.25.

**Frame Relay access device**

See *FRAD*.

**Frame Relay access support**

See *FRAS* in the “Cisco Systems Terms and Acronyms” section.

**Frame Relay bridging**

Bridging technique, described in RFC 1490, that uses the same spanning-tree algorithm as other bridging functions, but allows packets to be encapsulated for transmission across a Frame Relay network.

**frame switch**

See *LAN switch*.

**FRAS**

See *FRAS* (Frame Relay access support) in the “Cisco Systems Terms and Acronyms” section.

**FRASM**

Frame Relay access service module.

**freenet**

Community-based bulletin board system with e-mail, information services, interactive communications, and conferencing.

**free-trade zone**

Part of an AppleTalk internetwork that is accessible by two other parts of the internetwork that are unable to directly access one another.

**frequency**

Number of cycles, measured in hertz, of an alternating current signal per unit time.

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**frequency-division multiplexing**

See *FDM*.

**frequency modulation**

See *FM*.

**FRF**

Frame Relay Forum. An association of corporate members consisting of vendors, carriers, users and consultants committed to the implementation of Frame Relay in accordance with national and international standards. See [www.frforum.com](http://www.frforum.com).

**FRF.11**

Frame Relay Forum implementation agreement for Voice over Frame Relay (v1.0 May 1997). This specification defines multiplexed data, voice, fax, DTMF digit-relay and CAS/Robbed-bit signaling frame formats, but does not include call setup, routing or administration facilities. See [www.frforum.com](http://www.frforum.com).

**FRF.11 Annex C**

See *FRF.12*.

**FRF11-trunk**

Point to point permanent voice connection (private line) conforming to the FRF.11 specification.

**FRF.12**

The FRF.12 Implementation Agreement (also known as FRF.11 Annex C) was developed to allow long data frames to be fragmented into smaller pieces and interleaved with real-time frames. In this way, real-time voice and non real-time data frames can be carried together on lower speed links without causing excessive delay to the real-time traffic. See [www.frforum.com](http://www.frforum.com).

**FRMR**

Frame REJECT.

**front end**

Node or software program that requests services of a back end. See also *back end*, *client*, and *server*.

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**front-end processor**

See *FEP*.

**FSIP**

See *FSIP* (Fast Serial Interface Processor) in the “Cisco Systems Terms and Acronyms” section.

**FST**

See *FST* (Fast Sequenced Transport) in the “Cisco Systems Terms and Acronyms” section.

**FTAM**

File Transfer, Access, and Management. In OSI, an application layer protocol developed for network file exchange and management between diverse types of computers.

**FTP**

File Transfer Protocol. Application protocol, part of the TCP/IP protocol stack, used for transferring files between network nodes. FTP is defined in RFC 959.

**full duplex**

Capability for simultaneous data transmission between a sending station and a receiving station. Compare with *half duplex* and *simplex*.

**full mesh**

Term describing a network in which devices are organized in a mesh topology, with each network node having either a physical circuit or a virtual circuit connecting it to every other network node. A full mesh provides a great deal of redundancy, but because it can be prohibitively expensive to implement, it is usually reserved for network backbones. See also *mesh* and *partial mesh*.

**fully qualified domain name**

See *FQDN*.

**FUNI**

frame user network interface.



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**Fuzzball**

Digital Equipment Corporation LSI-11 computer system running IP gateway software. The NSFnet used these systems as backbone packet switches.

**FXO**

Foreign Exchange Office. An FXO interface connects to the Public Switched Telephone Network's (PSTN) central office and is the interface offered on a standard telephone. Cisco's FXO interface is an RJ-11 connector that allows an analog connection to be directed at the PSTN's central office or to a station interface on a PBX.

**FXS**

Foreign Exchange Station. An FXS interface connects directly to a standard telephone and supplies ring, voltage, and dial tone. Cisco's FXS interface is an RJ-11 connector that allows connections to basic telephone service equipment, keysets, and PBXes.



# G

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**G.703/G.704**

ITU-T electrical and mechanical specifications for connections between telephone company equipment and DTE using BNC connectors and operating at E1 data rates.

**G.711**

Describes the 64-kbps PCM voice coding technique. In G.711, encoded voice is already in the correct format for digital voice delivery in the PSTN or through PBXs. Described in the ITU-T standard in its G-series recommendations.

**G.723.1**

Describes a compression technique that can be used for compressing speech or audio signal components at a very low bit rate as part of the H.324 family of standards. This CODEC has two bit rates associated with it: 5.3 and 6.3 kbps. The higher bit rate is based on ML-MLQ technology and provides a somewhat higher quality of sound. The lower bit rate is based on CELP and provides system designers with additional flexibility. Described in the ITU-T standard in its G-series recommendations.

**G.726**

Describes ADPCM coding at 40, 32, 24, and 16 kbps. ADPCM-encoded voice can be interchanged between packet voice, PSTN, and PBX networks if the PBX networks are configured to support ADPCM. Described in the ITU-T standard in its G-series recommendations.

**G.728**

Describes a 16-kbps low-delay variation of CELP voice compression. CELP voice coding must be translated into a public telephony format for delivery to or through the PSTN. Described in the ITU-T standard in its G-series recommendations.

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**G.729**

Describes CELP compression where voice is coded into 8-kbps streams. There are two variations of this standard (G.729 and G.729 Annex A) that differ mainly in computational complexity; both provide speech quality similar to 32-kbps ADPCM. Described in the ITU-T standard in its G-series recommendations.

**G.804**

ITU-T framing standard that defines the mapping of ATM cells into the physical medium.

**Gatekeeper**

1. Component of an H.323 conferencing system that performs call address resolution, admission control, and subnet bandwidth management.

2. Telecommunications: H.323 entity on a LAN that provides address translation and control access to the LAN for H.323 terminals and gateways. The gatekeeper can provide other services to the H.323 terminals and gateways, such as bandwidth management and locating gateways. A gatekeeper maintains a registry of devices in the multimedia network. The devices register with the gatekeeper at startup and request admission to a call from the gatekeeper.

**gateway**

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

**Gateway Discovery Protocol**

See *GDP* in the “Cisco Systems Terms and Acronyms” section.

**gateway host**

In SNA, a host node that contains a gateway SSCP.

**gateway NCP**

NCP that connects two or more SNA networks and performs address translation to allow cross-network session traffic.

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**Gateway-to-Gateway Protocol**

See *GGP*.

**GB**

gigabyte. Approximately 1,000,000,000 bytes.

**GBps**

gigabytes per second.

**Gb**

gigabit. Approximately 1,000,000,000 bits.

**Gbps**

gigabits per second.

**GCAC**

generic connection admission control. In ATM, a PNNI algorithm designed for CBR and VBR connections. Any node can use GCAC to calculate the expected CAC behavior of another node given than node's advertised link metrics and the QoS of a connection setup request. See also *CAC*.

**GCRA**

generic cell rate algorithm. In ATM, an algorithm that defines conformance with respect to the traffic contract of the connection. For each cell arrival, the GCRA determines whether the cell conforms to the traffic contract.

**GDP**

See *GDP* (Gateway Discovery Protocol) in the "Cisco Systems Terms and Acronyms" section.

**generic connection admission control**

See *GCAC*.

**generic routing encapsulation**

See *GRE* in the "Cisco Systems Terms and Acronyms" section.

**Get Nearest Server**

See *GNS*.

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**GGP**

Gateway-to-Gateway Protocol. MILNET protocol specifying how core routers (gateways) should exchange reachability and routing information. GGP uses a distributed shortest-path algorithm.

**GHz**

gigahertz.

**gigabit**

Abbreviated Gb.

**gigabits per second**

Abbreviated Gbps.

**gigabyte**

Abbreviated GB.

**gigabytes per second**

Abbreviated GBps.

**gigahertz**

Abbreviated GHz.

**GIX**

Global Internet eXchange. Common routing exchange point which allows pairs of networks to implement agreed-upon routing policies. The GIX is intended to allow maximum connectivity to the Internet for networks all over the world. See *CIX*, *FIX*, and *MAE*.

**gleaning**

Process by which a router automatically derives AARP table entries from incoming packets. Gleaning speeds up the process of populating the AARP table. See also *AARP*.

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**GNS**

Get Nearest Server. Request packet sent by a client on an IPX network to locate the nearest active server of a particular type. An IPX network client issues a GNS request to solicit either a direct response from a connected server or a response from a router that tells it where on the internetwork the service can be located. GNS is part of the IPX SAP. See also *IPX* and *SAP (Service Advertisement Protocol)*.

**goodput**

Generally referring to the measurement of actual data successfully transmitted from the sender(s) to receiver(s). This is often a more useful measurement than the number of ATM cells per second throughput of an ATM switch if that switch is experiencing cell loss that results in many incomplete, and therefore unusable, frames arriving at the recipient.

**Gopher**

distributed document delivery system. The Internet Gopher allows a neophyte user to access various types of data residing on multiple hosts in a seamless fashion.

**GOSIP**

Government OSI Profile. U.S. government procurement specification for OSI protocols. Through GOSIP, the government mandates that all federal agencies standardize on OSI and implement OSI-based systems as they become commercially available.

**Government OSI Profile**

See *GOSIP*.

**grade of service**

Measure of telephone service quality based on the probability that a call will encounter a busy signal during the busiest hours of the day.

**graphical user interface**

See *GUI*.

**GRE**

See *GRE* (generic routing encapsulation) in the “Cisco Systems Terms and Acronyms” section.

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**ground station**

Collection of communications equipment designed to receive signals from (and usually transmit signals to) satellites. Also called a downlink station.

**Group 3**

Standard created by the International Telecommunications Union Telecommunications (ITU-T) relating to fax devices. A Group 3 fax device is a digital machine containing a 14400 baud modem that can transmit an 8 1/2 by 11 inch page in approximately 20 seconds with a resolution of either 203 by 98 dots per inch (dpi) or 203 by 196 dpi (fine), using Huffman code to compress fax data. Group 3 faxes use a standard dial-up telephone line for transmission.

**group address**

See *multicast address*.

**group delay**

See *distortion delay*.

**GSS**

Generic Service State.

**guard band**

Unused frequency band between two communications channels that provides separation of the channels to prevent mutual interference.

**GUI**

graphical user interface. User environment that uses pictorial as well as textual representations of the input and output of applications and the hierarchical or other data structure in which information is stored. Conventions such as buttons, icons, and windows are typical, and many actions are performed using a pointing device (such as a mouse). Microsoft Windows and the Apple Macintosh are prominent examples of platforms using a GUI.



# H

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**H.225.0**

An ITU standard that governs H.225.0 session establishment and packetization. H.225.0 actually describes several different protocols: RAS, use of Q.931, and use of RTP.

**H.245**

An ITU standard that governs H.245 endpoint control.

**H.320**

Suite of ITU-T standard specifications for videoconferencing over circuit-switched media such as ISDN, fractional T-1, and switched-56 lines.

**H.323**

Extension of ITU-T standard H.320 that enables videoconferencing over LANs and other packet-switched networks, as well as video over the Internet.

**H.323 RAS**

registration, admission, and status. The RAS signaling protocol performs registration, admissions, bandwidth changes, and status and disengage procedures between the VoIP gateway and the gatekeeper.

**hairpin**

Telephony term that means to send a call back in the direction that it came from. For example, if a call cannot be routed over IP to a gateway that is closer to the target telephone, the call is typically sent back out the local zone, back the way it came from.

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**half duplex**

Capability for data transmission in only one direction at a time between a sending station and a receiving station. BSC is an example of a half-duplex protocol. See also *BSC*. Compare with *full duplex* and *simplex*.

**handshake**

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

**hardware address**

See *MAC address*.

**HBD3**

Line code type used on E1 circuits.

**H channel**

high-speed channel. Full-duplex ISDN primary rate channel operating at 384 Kbps. Compare with *B channel*, *D channel*, and *E channel*.

**HDLC**

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

**HDSL**

high-data-rate digital subscriber line. One of four DSL technologies. HDSL delivers 1.544 Mbps of bandwidth each way over two copper twisted pairs. Because HDSL provides T1 speed, telephone companies have been using HDSL to provision local access to T1 services whenever possible. The operating range of HDSL is limited to 12,000 feet (3658.5 meters), so signal repeaters are installed to extend the service. HDSL requires two twisted pairs, so it is deployed primarily for PBX network connections, digital loop carrier systems, interexchange POPs, Internet servers, and private data networks. Compare with *ADSL*, *SDSL*, and *VDSL*.

**headend**

End point of a broadband network. All stations transmit toward the headend; the headend then transmits toward the destination stations.

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**header**

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

**heartbeat**

See *SQE*.

**HEC**

header error control. Algorithm for checking and correcting an error in an ATM cell. Using the fifth octet in the ATM cell header, ATM equipment will check for an error and correct the contents of the header. The check character is calculated using a CRC algorithm allowing a single bit error in the header to be corrected or multiple errors to be detected.

**HELLO**

Interior routing protocol used principally by NSFnet nodes. HELLO allows particular packet switches to discover minimal delay routes. Not to be confused with the *Hello protocol*.

**hello packet**

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

**Hello protocol**

Protocol used by OSPF systems for establishing and maintaining neighbor relationships. Not to be confused with HELLO.

**HEPnet**

High-Energy Physics Network. Research network that originated in the United States, but that has spread to most places involved in high-energy physics. Well-known sites include Argonne National Laboratory, Brookhaven National Laboratory, Lawrence Berkeley Laboratory, and the SLAC.

**hertz**

Measure of frequency. Abbreviated Hz. Synonymous with cycles per second.

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**heterogeneous network**

Network consisting of dissimilar devices that run dissimilar protocols and in many cases support dissimilar functions or applications.

**HFC**

hybrid fiber-coaxial. Technology being developed by the cable TV industry to provide two-way, high-speed data access to the home using a combination of fiber optics and traditional coaxial cable.

**hierarchical addressing**

Scheme of addressing that uses a logical hierarchy to determine location. For example, IP addresses consist of network numbers, subnet numbers, and host numbers, which IP routing algorithms use to route the packet to the appropriate location. Compare with *flat addressing*.

**hierarchical routing**

The complex problem of routing on large networks can be simplified by reducing the size of the networks. This is accomplished by breaking a network into a hierarchy of networks, where each level is responsible for its own routing.

**High-Energy Physics Network**

See *HEPnet*.

**High-Level Data Link Control**

See *HDLC*.

**High Performance Computing and Communications**

See *HPCC*.

**High Performance Computing Systems**

See *HPCS*.

**High-Performance Parallel Interface**

See *HIPPI*.

**High Performance Routing**

See *HPR*.

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**High-Speed Communications Interface**

See *HSCI* in the “Cisco Systems Terms and Acronyms” section.

**High-Speed Serial Interface**

See *HSSI*.

**highway**

See *bus*.

**HIP**

See *HIP* (HSSI Interface Processor) in the “Cisco Systems Terms and Acronyms” section.

**HIPPI**

High-Performance Parallel Interface. High-performance interface standard defined by ANSI. HIPPI is typically used to connect supercomputers to peripherals and other devices.

**holddown**

State into which a route is placed so that routers will neither advertise the route nor accept advertisements about the route for a specific length of time (the holddown period). Holddown is used to flush bad information about a route from all routers in the network. A route is typically placed in holddown when a link in that route fails.

**homologation**

Conformity of a product or specification to international standards, such as ITU-T, CSA, TUV, UL, or VCCI. Enables portability across company and international boundaries.

**hookflash**

Short on-hook period usually generated by a telephone-like device during a call to indicate that the telephone is attempting to perform a dial-tone recall from a PBX. Hookflash is often used to perform call transfer.

**hop**

Passage of a data packet between two network nodes (for example, between two routers). See also *hop count*.

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**hop count**

Routing metric used to measure the distance between a source and a destination. RIP uses hop count as its sole metric. See also *hookflash* and *RIP*.

**hop off**

Point at which a call transitions from H.323 to non-H.323, typically at a gateway.

**host**

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

**host address**

See *host number*.

**host name**

Name given to a machine. See *FQDN*.

**host node**

SNA subarea node that contains an SSCP. See also *SSCP*.

**host number**

Part of an IP address that designates which node on the subnetwork is being addressed. Also called a *host address*.

**Hot Standby Router Protocol**

See *HSRP* in the “Cisco Systems Terms and Acronyms” section.

**hot swapping**

See *OIR* and *power-on servicing*.

**HPCC**

High-Performance Computing and Communications. U.S. government funded program advocating advances in computing, communications, and related fields. The HPCC is designed to ensure U.S. leadership in these fields through education, research and development, industry collaboration, and implementation of high-performance technology. See also the five components of the HPCC: *ASTA*, *BRHR*, *HPCS*, *IITA*, and *NREN*.

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**HPCS**

High-Performance Computing Systems. Component of the HPCC program designed to ensure U.S. technological leadership in high-performance computing through research and development of computing systems and related software. See also *HPCC*.

**HPR**

High-Performance Routing. Second-generation routing algorithm for APPN. HPR provides a connectionless layer with nondisruptive routing of sessions around link failures, and a connection-oriented layer with end-to-end flow control, error control, and sequencing. Compare to *ISR*. See also *APPN*.

**HSCI**

See *HSCI* (High-Speed Communications Interface) in the “Cisco Systems Terms and Acronyms” section.

**HSRP**

See *HSRP* (Hot Standby Router Protocol) in the “Cisco Systems Terms and Acronyms” section.

**HSSI**

High-Speed Serial Interface. Network standard for high-speed (up to 52 Mbps) serial connections over WAN links.

**HSSI Interface Processor**

See *HIP* in the “Cisco Systems Terms and Acronyms” section.

**HTTP**

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

**HTML**

Hypertext Markup Language. Simple hypertext document formatting language that uses tags to indicate how a given part of a document should be interpreted by a viewing application, such as a Web browser. See also *hypertext* and *Web browser*.

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**hub**

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

**hybrid network**

Internetwork made up of more than one type of network technology, including LANs and WANs.

**hyperlink**

Pointer within a hypertext document that points (links) to another document, which may or may not also be a hypertext document.

**hypertext**

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

**Hypertext Transfer Protocol**

See *HTTP*.

**Hypertext Markup Language**

See *HTML*.

**Hz**

See *hertz*.



**IAB**

Internet Architecture Board. Board of internetwork researchers who discuss issues pertinent to Internet architecture. Responsible for appointing a variety of Internet-related groups such as the IANA, IESG, and IRSG. The IAB is appointed by the trustees of the ISOC. See also *IANA*, *IESG*, *IRSG*, and *ISOC*.

**IAHC**

Internet International Ad Hoc Committee. Coalition of participants from the broad Internet community, working to satisfy the requirement for enhancements to the Internet's global DNS. Organizations naming members to the committee include Internet Society (ISOC), Internet Assigned Numbers Authority (IANA), Internet Architecture Board (IAB), Federal Networking Council (FNC), International Telecommunication Union (ITU), International Trademark Association (INTA), and World Intellectual Property Organization (WIPO).

**IANA**

Internet Assigned Numbers Authority. Organization operated under the auspices of the ISOC as a part of the IAB. IANA delegates authority for IP address-space allocation and domain-name assignment to the InterNIC and other organizations. IANA also maintains a database of assigned protocol identifiers used in the TCP/IP stack, including autonomous system numbers. See also *ICP cell*, *ISOC*, and *InterNIC*.

**ICD**

International Code Designator. One of two ATM address formats developed by the ATM Forum for use by private networks. Adapted from the subnetwork model of addressing in which the ATM layer is responsible for mapping network layer addresses to ATM addresses. Compare with *DCC*.

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**ICMP**

Internet Control Message Protocol. Network layer Internet protocol that reports errors and provides other information relevant to IP packet processing. Documented in RFC 792.

**ICMP Router Discovery Protocol**

See *IRDP*.

**ICP cell**

IMA control protocol cell used for aligning the cells in multiple links.

**ICR**

initial cell rate.

**I-D**

Internet-Draft. Working documents of the IETF, from its Areas and Working Groups. They are valid for a maximum of 6 months and might be updated, replaced, or obsoleted by other documents at any time. Very often, I-Ds are precursors to RFCs.

**IDI**

initial domain identifier. Portion of an NSAP or NSAP-format ATM address that specifies the address allocation and administration authority. See also *NSAP*.

**IDN**

International Data Number. See *X.121*.

**IDP**

initial domain part. Part of a CLNS address that contains an authority and format identifier, and a domain identifier.

**IDPR**

Interdomain Policy Routing. Interdomain routing protocol that dynamically exchanges policies between autonomous systems. IDPR encapsulates interautonomous system traffic and routes it according to the policies of each autonomous system along the path. IDPR is currently an IETF proposal. See also *policy-based routing*.

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**IDRP**

IS-IS Interdomain Routing Protocol. OSI protocol that specifies how routers communicate with routers in different domains.

**IE**

information element.

**IEC**

International Electrotechnical Commission. Industry group that writes and distributes standards for electrical products and components.

**IEEE**

Institute of Electrical and Electronics Engineers. Professional organization whose activities include the development of communications and network standards. IEEE LAN standards are the predominant LAN standards today.

**IEEE 802.1**

IEEE specification that describes an algorithm that prevents bridging loops by creating a spanning tree. The algorithm was invented by Digital Equipment Corporation. The Digital algorithm and the IEEE 802.1 algorithm are not exactly the same, nor are they compatible. See also *spanning tree*, *spanning-tree algorithm*, and *Spanning-Tree Protocol*.

**IEEE 802.12**

IEEE LAN standard that specifies the physical layer and the MAC sublayer of the data link layer. IEEE 802.12 uses the demand priority media-access scheme at 100 Mbps over a variety of physical media. See also *100VG-AnyLAN*.

**IEEE 802.2**

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

**IEEE 802.3**

IEEE LAN protocol that specifies an implementation of the physical layer and the MAC sublayer of the data link layer. IEEE 802.3 uses CSMA/CD access at a variety of speeds over a variety of physical media. Extensions to the IEEE 802.3 standard specify

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implementations for Fast Ethernet. Physical variations of the original IEEE 802.3 specification include *10Base2*, *10Base5*, *10BaseF*, *10BaseT*, and *10Broad36*. Physical variations for *Fast Ethernet* include *100BaseT*, *100BaseT4*, and *100BaseX*.

**IEEE 802.4**

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

**IEEE 802.5**

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

**IEEE 802.6**

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

**IEPG**

Internet Engineering Planning Group. Group, primarily composed of Internet service operators, whose goal is to promote a globally coordinated Internet operating environment. Membership is open to all.

**IESG**

Internet Engineering Steering Group. Organization, appointed by the IAB, that manages the operation of the IETF. See also *ICP cell* and *IETF*.

**IETF**

Internet Engineering Task Force. Task force consisting of over 80 working groups responsible for developing Internet standards. The IETF operates under the auspices of ISOC. See also *ISOC*.

**IFIP**

International Federation for Information Processing. Research organization that performs OSI prestandardization work. Among other accomplishments, IFIP formalized the original MHS model. See also *MHS*.

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**I-frame**

Information frame. One of three SDLC frame formats. See also *S-frame* and *U-frame*.

**IGMP**

Internet Group Management Protocol. Used by IP hosts to report their multicast group memberships to an adjacent multicast router. See also *multicast router*.

**IGP**

Interior Gateway Protocol. Internet protocol used to exchange routing information within an autonomous system. Examples of common Internet IGPs include IGRP, OSPF, and RIP. See also *OSPF* and *RIP*. See also *IGRP* (Interior Gateway Routing Protocol) in the “Cisco Systems Terms and Acronyms” section.

**IGRP**

See *IGRP* (Interior Gateway Routing Protocol) in the “Cisco Systems Terms and Acronyms” section.

**IIH**

IS-IS Hello. Message sent by all IS-IS systems to maintain adjacencies. See also *IS-IS*.

**IINREN**

Interagency Interim National Research and Education Network. Evolving operating network system. Near term research and development activities will provide for the smooth evolution of this networking infrastructure into the future gigabit NREN.

**IIOP**

Internet Inter-ORB Protocol. Protocol used in the CORBA framework for accessing objects across the Internet. See also *CORBA*.

**IISP**

Interim-Interswitch Signaling Protocol. ATM signaling protocol for inter-switch communication using manually configured prefix tables. When a signaling request is received by a switch, the switch checks the destination ATM address against the prefix table and notes the port with the longest prefix match. It then forwards the signaling request across that port using UNI procedures. IISP is an interim solution until PNNI Phase 1 is completed. Formerly known as PNNI Phase 0. Contrast with *Dynamic IISP*.

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**IITA**

Information Infrastructure Technology and Applications. Component of the HPCC program intended to ensure U.S. leadership in the development of advanced information technologies. See also *HPCC*.

**IKE**

Internet Key Exchange

**ILMI**

Interim Local Management Interface. Specification developed by the ATM Forum for incorporating network-management capabilities into the ATM UNI.

**IMA**

inverse multiplexing over ATM. Standard protocol defined by the ATM Forum in 1997.

**IMA group**

Physical links grouped to form a higher-bandwidth logical link whose rate is approximately the sum of the individual link rates.

**IMAP**

Internet Message Access Protocol. Method of accessing e-mail or bulletin board messages kept on a mail server that can be shared. IMAP permits client electronic mail applications to access remote message stores as if they were local without actually transferring the message.

**IMHO**

“In My Humble Opinion.” One of many short-form phrases seen in e-mail messages, newsgroups, and so on.

**IMP**

interface message processor. Old name for ARPANET packet switches. See also *ARPANET* and *packet switch*.

**IMT**

Inter-Machine Trunk.

**IN/AIN**

Intelligent Network/Advanced Intelligent Network

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**INA**

Information Networking Architecture. Bellcore object-oriented architecture for the management of ATM and SONET equipment and services in an operating company environment.

**INASoft**

Bellcore implementation of INA. See also *INA*.

**INB**

Install Busy. Entity has just been created but has not been commanded In-Service or Out-of-Service yet.

**in-band signaling**

Transmission within a frequency range normally used for information transmission. Compare with *out-of-band signaling*.

**Industry-Standard Architecture**

See *ISA*.

**information element**

In ATM, the portion of a signaling packet that carries information, such as addresses, used in the UNI specification. See also *UNI*.

**Information Infrastructure Technology and Applications**

See *IITA*.

**infrared**

Electromagnetic waves whose frequency range is above that of microwaves, but below that of the visible spectrum. LAN systems based on this technology represent an emerging technology.

**INE**

Intelligent Network Element. Network element that can be provisioned from a remote OSS.

**initial domain identifier**

See *IDI*.

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**initial domain part**

See *IDP*.

**INOC**

Internet Network Operations Center. BBN group that in the early days of the Internet monitored and controlled the Internet core gateways (routers). INOC no longer exists in this form.

**input/output**

See *IN/AIN*.

**Institute of Electrical and Electronics Engineers**

See *IEEE*.

**insured burst**

In an ATM network, the largest burst of data above the insured rate that will be temporarily allowed on a PVC and not tagged by the traffic policing function for dropping in the case of network congestion. The insured burst is specified in bytes or cells. Compare with *maximum burst*. See also *insured rate*.

**insured rate**

Long-term data throughput, in bits or cells per second, that an ATM network commits to support under normal network conditions. The insured rate is 100 percent allocated; the entire amount is deducted from the total trunk bandwidth along the path of the circuit. Compare with *excess rate* and *maximum rate*. See also *insured burst*.

**insured traffic**

Traffic within the insured rate specified for an ATM PVC. This traffic should not be dropped by the network under normal network conditions. See also *CLP* and *insured rate*.

**INTAP**

Interoperability Technology Association for Information Processing. Technical organization that has the official charter to develop Japanese OSI profiles and conformance tests.



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**Integrated IS-IS**

Routing protocol based on the OSI routing protocol IS-IS, but with support for IP and other protocols. Integrated IS-IS implementations send only one set of routing updates, making it more efficient than two separate implementations. Formerly called Dual IS-IS. Compare with *IS-IS*.

**Integrated Services Digital Network**

See *ISDN*.

**Integrated Services Internet**

IETF proposal for enhancing IP to allow it to support integrated or multimedia services, including traffic management mechanisms that closely match the traffic management mechanisms of ATM. An example is RSVP.

**Intelligent QoS Management Suite**

Composed of Automatic Routing Management, Advanced CoS Management, Optimized Bandwidth Management, and Dynamic Buffer Management. Formerly called Advanced Networking Features.

**interarea routing**

Term used to describe routing between two or more logical areas. Compare with *intra-area routing*.

**Interdomain Policy Routing**

See *IDPR*.

**interface**

1. Connection between two systems or devices.
2. In routing terminology, a network connection.
3. In telephony, a shared boundary defined by common physical interconnection characteristics, signal characteristics, and meanings of interchanged signals.
4. Boundary between adjacent layers of the OSI model.

**interface message processor**

See *IMP*.

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**interface processor**

See *interface processor* in the “Cisco Systems Terms and Acronyms” section.

**interference**

Unwanted communication channel noise.

**Interim Local Management Interface**

See *ILMI*.

**Interior Gateway Protocol**

See *IGP*.

**Interior Gateway Routing Protocol**

See *IGRP* in the “Cisco Systems Terms and Acronyms” section.

**intermediate routing node**

See *IRN*.

**Intermediate Session Routing**

See *ISR*.

**intermediate system**

See *IS*.

**Intermediate System-to-Intermediate System**

See *IS-IS*.

**International Code Designator**

See *ICD*.

**International Data Number**

See *X.121*.

**International Electrotechnical Commission**

See *IEC*.

**International Federation for Information Processing**

See *IFIP*.

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**International Organization for Standardization**

See *ISO*.

**International Standards Organization**

Erroneous expansion of the acronym ISO. See *ISO*.

**International Telecommunication Union Telecommunication Standardization Sector**

See *ITU-T*.

**Internet**

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

**internet**

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

**Internet Architecture Board**

See *ICP cell*.

**Internet address**

See *IP address*.

**Internet Assigned Numbers Authority**

See *IANA*.

**Internet Control Message Protocol**

See *ICMP*.

**Internet-Draft**

See *I-D*.

**Internet Engineering Planning Group**

See *IEPG*.

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**Internet Engineering Steering Group**

See *IESG*.

**Internet Engineering Task Force**

See *IETF*.

**Internet Group Management Protocol**

See *IGMP*.

**Internet Message Access Protocol**

See *IMAP*.

**Internet Network Operations Center**

See *INOC*.

**Internet protocol**

Any protocol that is part of the TCP/IP protocol stack. See *IP*. See also *TCP/IP*.

**Internet Protocol (IP, IPv4)**

Network layer for the TCP/IP protocol suite. Internet Protocol (version 4) is a connectionless, best-effort packet switching protocol. Defined in RFC 791.

**Internet Protocol (IPng, IPv6)**

See *IPv6*.

**Internet Registry**

See *IR*.

**Internet Relay Chat**

See *IRC*.

**Internet Research Steering Group**

See *IRSG*.

**Internet Research Task Force**

See *IRTF*.

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**Internet service provider**

See *ISP*.

**Internet Society**

See *ISOC*.

**Internet telephony**

Generic term used to describe various approaches to running voice telephony over IP.

**internetwork**

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

**internetworking**

General term used to refer to the industry devoted to connecting networks together. The term can refer to products, procedures, and technologies.

**Internetwork Packet Exchange**

See *IPX*.

**InterNIC**

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

**interoperability**

Ability of computing equipment manufactured by different vendors to communicate with one another successfully over a network.

**Inter-Switching System Interface**

See *ISSI*.

**Inter-Switch Link**

See *ISL* in the “Cisco Systems Terms and Acronyms” section.

**intra-area routing**

Term used to describe routing within a logical area. Compare with *interarea routing*.

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**Inverse Address Resolution Protocol**

See *Inverse ARP*.

**Inverse ARP**

Inverse Address Resolution Protocol. Method of building dynamic routes in a network. Allows an access server to discover the network address of a device associated with a virtual circuit.

**inverse multiplexing**

Process whereby physical links are grouped to form a higher-bandwidth logical link whose rate is approximately the sum of the individual link rates.

**I/O**

input/output.

**IOC**

independent operating company. Independently owned company providing local telephone services to residential and business customers in a geographic area not served by an RBOC.

**IOCC**

I/O channel controller.

**IONL**

Internal Organization of the Network Layer. OSI standard for the detailed architecture of the network layer. Basically, it partitions the network layer into subnetworks interconnected by convergence protocols (equivalent to internet working protocols), creating what the Internet community calls a catenet or internet.

**IOS**

See *Cisco IOS* in the “Cisco Systems Terms and Acronyms” section.

**IP**

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

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**IP address**

32-bit address assigned to hosts using TCP/IP. An IP address belongs to one of five classes (A, B, C, D, or E) and is written as 4 octets separated by periods (dotted decimal format). Each address consists of a network number, an optional subnetwork number, and a host number. The network and subnetwork numbers together are used for routing, while the host number is used to address an individual host within the network or subnetwork. A subnet mask is used to extract network and subnetwork information from the IP address. CIDR provides a new way of representing IP addresses and subnet masks. Also called an Internet address. See also *CIDR*, *IP*, and *subnet mask*.

**IP datagram**

Fundamental unit of information passed across the Internet. Contains source and destination addresses along with data and a number of fields that define such things as the length of the datagram, the header checksum, and flags to indicate whether the datagram can be (or was) fragmented.

**IPC**

interprocess communication.

**IPCP**

IP Control Protocol. Protocol that establishes and configures IP over PPP. See also *IP* and *PPP*.

**IP multicast**

Routing technique that allows IP traffic to be propagated from one source to a number of destinations or from many sources to many destinations. Rather than sending one packet to each destination, one packet is sent to a multicast group identified by a single IP destination group address.

**IPng**

See *IPv6*.

**IPv6**

IP version 6. Replacement for the current version of IP (version 4). IPv6 includes support for flow ID in the packet header, which can be used to identify flows. Formerly called IPng (next generation).

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**IP Security Option**

See *IPSO*.

**IPSO**

IP Security Option. U.S. government specification that defines an optional field in the IP packet header that defines hierarchical packet security levels on a per interface basis.

**IPX**

Internetwork Packet Exchange. NetWare network layer (Layer 3) protocol used for transferring data from servers to workstations. IPX is similar to IP and XNS.

**IPXCP**

IPX Control Protocol. Protocol that establishes and configures IPX over PPP. See also *IPX* and *PPP*.

**IPXWAN**

IPX wide-area network. Protocol that negotiates end-to-end options for new links. When a link comes up, the first IPX packets sent across are IPXWAN packets negotiating the options for the link. When the IPXWAN options are successfully determined, normal IPX transmission begins. Defined by RFC 1362.

**IR**

Internet Registry. IR was delegated the responsibility of network address and autonomous system identifiers from the IANA, which has the discretionary authority to delegate portions of its responsibility.

**IRB**

integrated routing and bridging

Integrated Services Digital Network (ISDN) User Part. An upper-layer application supported by SS7 for connection set up and tear down.

**IRC**

Internet Relay Chat. World-wide “party line” protocol that allows one to converse with others in real time. IRC is structured as a network of servers, each of which accepts connections from client programs, one per user.



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**IRDP**

ICMP Router Discovery Protocol. Protocol that enables a host to determine the address of a router that it can use as a default gateway. Similar to ES-IS, but used with IP. See also *ES-IS*.

**IRN**

intermediate routing node. In SNA, a subarea node with intermediate routing capability.

**IRSG**

Internet Research Steering Group. Group that is part of the IAB and oversees the activities of the IRTF. See also *ICP cell* and *IRTF*.

**IRTF**

Internet Research Task Force. Community of network experts that considers Internet-related research topics. The IRTF is governed by the IRSG and is considered a subsidiary of the IAB. See also *ICP cell* and *IRSG*.

**IS**

1. intermediate system. Routing node in an OSI network.
2. Telecommunications: In-Service. Entity is fully operational and capable of providing service to a requesting entity.

**ISA**

Industry-Standard Architecture. 16-bit bus used for Intel-based personal computers. See also *EISA*.

**isarithmic flow control**

Flow control technique that permits travel through the network. Isarithmic flow control is not commonly implemented.

**ISDN**

Integrated Services Digital Network. Communication protocol, offered by telephone companies, that permits telephone networks to carry data, voice, and other source traffic. See also *BISDN*, *BRI*, *N-ISDN*, and *PRI*.

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**IS-IS**

Intermediate System-to-Intermediate System. OSI link-state hierarchical routing protocol based on DECnet Phase V routing, whereby ISs (routers) exchange routing information based on a single metric, to determine network topology. Compare with *Integrated IS-IS*. See also *ES-IS* and *OSPF*.

**IS-IS Hello**

See *IIH*.

**IS-IS Interdomain Routing Protocol**

See *IDRP*.

**ISL**

See *ISL* (Inter-Switch Link) in the “Cisco Systems Terms and Acronyms” section.

**ISM**

internetwork status monitor .

**ISO**

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

**ISO 3309**

HDLC procedures developed by ISO. ISO 3309:1979 specifies the HDLC frame structure for use in synchronous environments. ISO 3309:1984 specifies proposed modifications to allow the use of HDLC in asynchronous environments as well.

**ISO 9000**

Set of international quality-management standards defined by ISO. The standards, which are not specific to any country, industry, or product, allow companies to demonstrate that they have specific processes in place to maintain an efficient quality system.

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**ISOC**

Internet Society. International nonprofit organization, founded in 1992, that coordinates the evolution and use of the Internet. In addition, ISOC delegates authority to other groups related to the Internet, such as the IAB. ISOC is headquartered in Reston, Virginia, (United States). See also *ICP cell*.

**isochronous transmission**

Asynchronous transmission over a synchronous data link. Isochronous signals require a constant bit rate for reliable transport. Compare with *asynchronous transmission*, *plesiochronous transmission*, and *synchronous transmission*.

**ISODE**

ISO development environment. Large set of libraries and utilities used to develop upper-layer OSI protocols and applications.

**ISO development environment**

See *ISODE*.

**ISP**

Internet service provider. Company that provides Internet access to other companies and individuals.

**ISR**

Intermediate Session Routing. Initial routing algorithm used in APPN. ISR provides node-to-node connection-oriented routing. Network outages cause sessions to fail because ISR cannot provide nondisruptive rerouting around a failure. ISR was replaced by HPR. Compare with *HPR*. See also *APPN*.

**ISSI**

Inter-Switching System Interface. Standard interface between SMDS switches.

**ISUP**

ISDN User Part.

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**ITU-T**

International Telecommunication Union Telecommunication Standardization Sector. International body that develops worldwide standards for telecommunications technologies. The ITU-T carries out the functions of the former CCITT. See also *CCITT*.

**IVR**

interactive voice response. Term used to describe systems that provide information in the form of recorded messages over telephone lines in response to user input in the form of spoken words or more commonly DTMF signaling. Examples include banks that allow you to check your balance from any telephone and automated stock quote systems.

**IXC**

inter-exchange carrier. Common carrier providing long distance connectivity between LATAs. The three major IXCs are AT&T, MCI, and Sprint, but several hundred IXCs offer long distance service in the United States.

## J

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### **jabber**

1. Error condition in which a network device continually transmits random, meaningless data onto the network.
2. In IEEE 802.3, a data packet whose length exceeds that prescribed in the standard.

### **JANET**

Joint Academic Network. X.25 WAN connecting university and research institutions in the United Kingdom.

### **Japan UNIX Network**

See *JUNET*.

### **Java**

Object-oriented programming language developed at Sun Microsystems to solve a number of problems in modern programming practice. The Java language is used extensively on World-Wide Web, particularly for applets.

### **JDBC**

Java Database Connectivity. Java API that enables Java programs to execute SQL statements. This allows Java programs to interact with any SQL-compliant database. Since nearly all relational database management systems (DBMSs) support SQL, and because Java itself runs on most platforms, JDBC makes it possible to write a single database application that can run on different platforms and interact with different DBMSs. JDBC is similar to ODBC, but is designed specifically for Java programs, whereas ODBC is language-independent. JDBC was developed by JavaSoft, a subsidiary of Sun Microsystems. See *ODBC*.

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**jitter**

Analog communication line distortion caused by the variation of a signal from its reference timing positions. Jitter can cause data loss, particularly at high speeds.

**John von Neumann Computer Network**

See *JvNCnet*.

**Joint Academic Network**

See *JANET*.

**JPEG**

Joint Photographics Expert Group. Graphic file format that was adopted as a standard by the ITU-T and the ISO. JPEG is most often used to compress still images using DCT analysis.

**jumper**

Electrical switch consisting of a number of pins and a connector that can be attached to the pins in a variety of different ways. Different circuits are created by attaching the connector to different pins.

**JUNET**

Japan UNIX Network. Nationwide, noncommercial network in Japan, designed to promote communication between Japanese and other researchers.

**JvNCnet**

John von Neumann Computer Network. Regional network, owned and operated by Global Enterprise Services, Inc., composed of T1 and slower serial links providing midlevel networking services to sites in the Northeastern United States.

# K

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**KA9Q**

Popular implementation of TCP/IP and associated protocols for amateur packet radio systems.

**Karn's algorithm**

Algorithm that improves round-trip time estimations by helping transport layer protocols distinguish between good and bad round-trip time samples.

**KB**

kilobyte. Approximately 1,000 bytes.

**Kb**

kilobit. Approximately 1,000 bits.

**kBps**

kilobytes per second.

**kbps**

kilobits per second.

**keepalive interval**

Period of time between each keepalive message sent by a network device.

**keepalive message**

Message sent by one network device to inform another network device that the virtual circuit between the two is still active.

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**Kerberos**

Developing standard for authenticating network users. Kerberos offers two key benefits: it functions in a multivendor network, and it does not transmit passwords over the network.

**Kermit**

Popular file-transfer and terminal-emulation program.

**kilobit**

Abbreviated Kb.

**kilobits per second**

Abbreviated kbps.

**kilobyte**

Abbreviated KB.

**kilobytes per second**

Abbreviated kBps.

**kVA**

kilovoltampere.



# L

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**L2F Protocol**

Layer 2 Forwarding Protocol. Protocol that supports the creation of secure virtual private dial-up networks over the Internet.

**label swapping**

Routing algorithm used by APPN in which each router that a message passes through on its way to its destination independently determines the best path to the next router.

**LAN**

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

**LANE**

LAN emulation. Technology that allows an ATM network to function as a LAN backbone. The ATM network must provide multicast and broadcast support, address mapping (MAC-to-ATM), SVC management, and a usable packet format. LANE also defines Ethernet and Token Ring ELANs. See also *ELAN*.

**LANE UNI**

LANE User-Network Interface.

**LAN emulation**

See *LANE*.

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**LAN Emulation Client**

See *LEC*.

**LAN Emulation Configuration Server**

See *LECS*.

**LAN Emulation Server**

See *LES*.

**LAN Manager**

Distributed NOS, developed by Microsoft, that supports a variety of protocols and platforms. See also *NOS*.

**LAN Manager for UNIX**

See *LM/X*.

**LAN Network Manager**

See *LNM*.

**LAN Server**

Server-based NOS developed by IBM and derived from LNM. See also *LNM*.

**LAN switch**

High-speed switch that forwards packets between data-link segments. Most LAN switches forward traffic based on MAC addresses. This variety of LAN switch is sometimes called a frame switch. LAN switches are often categorized according to the method they use to forward traffic: cut-through packet switching or store-and-forward packet switching. Multilayer switches are an intelligent subset of LAN switches. Compare with *multilayer switch*. See also *cut-through packet switching* and *store and forward packet switching*.

**LAPB**

Link Access Procedure, Balanced. Data link layer protocol in the X.25 protocol stack. LAPB is a bit-oriented protocol derived from HDLC. See also *HDLC* and *X.25*.

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**LAPD**

Link Access Procedure on the D channel. ISDN data link layer protocol for the D channel. LAPD was derived from the LAPB protocol and is designed primarily to satisfy the signaling requirements of ISDN basic access. Defined by ITU-T Recommendations Q.920 and Q.921.

**LAPM**

Link Access Procedure for Modems. ARQ used by modems implementing the V.42 protocol for error correction. See also *ARQ* and *V.42*.

**laser**

light amplification by stimulated emission of radiation. Analog transmission device in which a suitable active material is excited by an external stimulus to produce a narrow beam of coherent light that can be modulated into pulses to carry data. Networks based on laser technology are sometimes run over SONET.

**LAT**

local-area transport. A network virtual terminal protocol developed by Digital Equipment Corporation.

**LATA**

local access and transport area. Geographic telephone dialing area serviced by a single local telephone company. Calls within LATAs are called local calls. There are well over 100 LATAs in the United States.

**latency**

1. Delay between the time a device requests access to a network and the time it is granted permission to transmit.
2. Delay between the time a device receives a frame and the time that frame is forwarded out the destination port.

**Layer 3 Switching**

Emerging Layer 3 switching technology that integrates routing with switching to yield very high routing throughput rates in the millions-of-packets-per-second range. The movement to Layer 3 switching is designed to address the downsides of the current

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generation of layer 2 switches, which are functionally equivalent to bridges. These downsides for a large, flat network include being subject to broadcast storms, spanning tree loops, and address limitations.

**LCI**

logical channel identifier. See *VCN*.

**LCN**

logical channel number. See *VCN*.

**LCP**

link control protocol. Protocol that establishes, configures, and tests data-link connections for use by PPP. See also *PPP*.

**LCV**

line code violation. Occurrence of a BPV or EXZ error event.

**LDAP**

Lightweight Directory Access Protocol. Protocol that provides access for management and browser applications that provide read/write interactive access to the X.500 Directory.

**LDCELP**

low-delay CELP. CELP voice compression algorithm providing 16 Kbps, or 4:1 compression. Standardized in ITU-T Recommendation G.728.

**leaf internetwork**

In a star topology, an internetwork whose sole access to other internetworks in the star is through a core router.

**leaky bucket**

In ATM, a metaphor for the GCRA, which is used for conformance checking of cell flows from a user or network. The hole in the bucket represents the sustained rate at which cells can be accommodated, and the bucket depth represents the tolerance for cell bursts over a period of time. See also *GCRA*.

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**learning bridge**

Bridge that performs MAC address learning to reduce traffic on the network. Learning bridges manage a database of MAC addresses and the interfaces associated with each address. See also *MAC address learning*.

**leased line**

Transmission line reserved by a communications carrier for the private use of a customer. A leased line is a type of dedicated line. See also *dedicated line*.

**LE\_ARP**

LAN Emulation Address Resolution Protocol. Protocol that provides the ATM address that corresponds to a MAC address.

**LEC**

1. LAN Emulation Client. Entity in an end system that performs data forwarding, address resolution, and other control functions for a single ES within a single ELAN. An LEC also provides a standard LAN service interface to any higher-layer entity that interfaces to the LEC. Each LEC is identified by a unique ATM address, and is associated with one or more MAC addresses reachable through that ATM address. See also *ELAN* and *LES*.

2. local exchange carrier. Local or regional telephone company that owns and operates a telephone network and the customer lines that connect to it.

**LECS**

LAN Emulation Configuration Server. Entity that assigns individual LANE clients to particular ELANs by directing them to the LES that corresponds to the ELAN. There is logically one LECS per administrative domain, and this serves all ELANs within that domain. See also *ELAN*.

**LED**

light emitting diode. Semiconductor device that emits light produced by converting electrical energy. Status lights on hardware devices are typically LEDs.

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**LEN node**

low-entry networking node. In SNA, a PU 2.1 that supports LU protocols, but whose CP cannot communicate with other nodes. Because there is no CP-to-CP session between a LEN node and its NN, the LEN node must have a statically defined image of the APPN network.

**LES**

LAN Emulation Server. Entity that implements the control function for a particular ELAN. There is only one logical LES per ELAN, and it is identified by a unique ATM address. See also *ELAN*.

**Level 1 router**

Device that routes traffic within a single DECnet or OSI area.

**Level 2 router**

Device that routes traffic between DECnet or OSI areas. All Level 2 routers must form a contiguous network.

**LGN**

logical group node. The node that represents its peer group in the peer group's parent peer group. See also *parent peer group* and *peer group*.

**light amplification by stimulated emission of radiation**

See *laser*.

**light emitting diode**

See *LED*.

**limited resource link**

Resource defined by a device operator to remain active only when being used.

**limited-route explorer packet**

See *spanning explorer packet*.

**line**

1. In SNA, a connection to the network.
2. See *link*.

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**line card**

Any I/O card that can be inserted in a modular chassis.

**line code type**

One of a number of coding schemes used on serial lines to maintain data integrity and reliability. The line code type used is determined by the carrier service provider. See also *AMI*, *B8ZS*, and *HBD3*.

**line code violation**

See *LCV*.

**line conditioning**

Use of equipment on leased voice-grade channels to improve analog characteristics, thereby allowing higher transmission rates.

**line driver**

Inexpensive amplifier and signal converter that conditions digital signals to ensure reliable transmissions over extended distances.

**line of sight**

Characteristic of certain transmission systems such as laser, microwave, and infrared systems in which no obstructions in a direct path between transmitter and receiver can exist.

**line printer daemon**

See *LPD*.

**line turnaround**

Time required to change data transmission direction on a telephone line.

**link**

Network communications channel consisting of a circuit or transmission path and all related equipment between a sender and a receiver. Most often used to refer to a WAN connection. Sometimes referred to as a line or a transmission link.

**Link Access Procedure, Balanced**

See *LAPB*.

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**Link Access Procedure for Modems**

See *LAPM*.

**Link Access Procedure on the D channel**

See *LAPD*.

**Link Control Protocol**

See *LCP*.

**link layer**

See *data-link layer*.

**link-layer address**

See *MAC address*.

**link-state advertisement**

See *LSA*.

**link-state packet**

See *LSA*.

**link-state routing algorithm**

Routing algorithm in which each router broadcasts or multicasts information regarding the cost of reaching each of its neighbors to all nodes in the internetwork. Link state algorithms create a consistent view of the network and are therefore not prone to routing loops, but they achieve this at the cost of relatively greater computational difficulty and more widespread traffic (compared with distance vector routing algorithms). Compare with *distance vector routing algorithm*. See also *Dijkstra's algorithm*.

**LIS**

logical IP subnet. A group of IP nodes (such as hosts and routers) that connects to a single ATM network and belongs to the same IP subnet.

**listserv**

Automated mailing list distribution system originally designed for the Bitnet/EARN network. Allows users to add or delete themselves from mailing lists without (other) human intervention.



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**little-endian**

Method of storing or transmitting data in which the least significant bit or byte is presented first. Compare with *big-endian*.

**LLAP**

LocalTalk Link Access Protocol. Link-level protocol that manages node-to-node delivery of data on a LocalTalk network. LLAP manages bus access, provides a node-addressing mechanism, and controls data transmission and reception, ensuring packet length and integrity. See also *LocalTalk*.

**LLC**

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

**LLC2**

Logical Link Control, type 2. Connection-oriented OSI LLC-sublayer protocol. See also *LLC*.

**LMI**

Local Management Interface. Set of enhancements to the basic Frame Relay specification. LMI includes support for a keepalive mechanism, which verifies that data is flowing; a multicast mechanism, which provides the network server with its local DLCI and the multicast DLCI; global addressing, which gives DLCIs global rather than local significance in Frame Relay networks; and a status mechanism, which provides an on-going status report on the DLCIs known to the switch. Known as *LMT* in ANSI terminology.

**LMT**

See *LMI*.

**LM/X**

LAN Manager for UNIX. Monitors LAN devices in UNIX environments.

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**LNNI**

LAN Emulation Network-to-Network Interface. Supports communication between the server components within a single ELAN. Phase 1 LANE protocols do not allow for the standard support of multiple LESs or BUSs within an ELAN. Phase 2 addresses these limitations.

**LNM**

LAN Network Manager. SRB and Token Ring management package provided by IBM. Typically running on a PC, it monitors SRB and Token Ring devices, and can pass alerts up to NetView.

**load balancing**

In routing, the ability of a router to distribute traffic over all its network ports that are the same distance from the destination address. Good load-balancing algorithms use both line speed and reliability information. Load balancing increases the use of network segments, thus increasing effective network bandwidth.

**local access and transport area**

See *LATA*.

**local acknowledgment**

Method whereby an intermediate network node, such as a router, responds to acknowledgments for a remote end host. Use of local acknowledgments reduces network overhead and, therefore, the risk of time-outs. Also known as *local termination*.

**local adjacency**

See *local adjacency* in the “Cisco Systems Terms and Acronyms” section.

**local-area network**

See *LAN*.

**local-area transport**

See *LAT*.

**local bridge**

Bridge that directly interconnects networks in the same geographic area.

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**local exchange carrier**

See *LEC*.

**local explorer packet**

Packet generated by an end system in an SRB network to find a host connected to the local ring. If the local explorer packet fails to find a local host, the end system produces either a spanning explorer packet or an all-routes explorer packet. See also *all-routes explorer packet*, *explorer packet*, and *spanning explorer packet*.

**local loop**

Line from the premises of a telephone subscriber to the telephone company CO.

**Local Management Interface**

See *LMI*.

**LocalTalk**

Apple Computer's proprietary baseband protocol that operates at the data link and physical layers of the OSI reference model. LocalTalk uses CSMA/CD and supports transmissions at speeds of 230.4 Kbps.

**LocalTalk Link Access Protocol**

See *LLAP*.

**local termination**

See *local acknowledgment*.

**local traffic filtering**

Process by which a bridge filters out (drops) frames whose source and destination MAC addresses are located on the same interface on the bridge, thus preventing unnecessary traffic from being forwarded across the bridge. Defined in the IEEE 802.1 standard. See also *IEEE 802.1*.

**logical address**

See *network address*.

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**logical channel**

Nondedicated, packet-switched communications path between two or more network nodes. Packet switching allows many logical channels to exist simultaneously on a single physical channel.

**logical channel identifier**

See *LCI*.

**logical channel number**

See *LCN*.

**logical group node**

See *LGN*.

**Logical Link Control**

See *LLC*.

**Logical Link Control, type 2**

See *LLC2*.

**logical unit**

See *LU*.

**Logical Unit 6.2**

See *LU 6.2*.

**loop**

Route where packets never reach their destination, but simply cycle repeatedly through a constant series of network nodes.

**loopback test**

Test in which signals are sent and then directed back toward their source from some point along the communications path. Loopback tests are often used to test network interface usability.

**lossy**

Characteristic of a network that is prone to lose packets when it becomes highly loaded.

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**low-entry networking node**

See *LEN node*.

**LPD**

line printer daemon. Protocol used to send print jobs between UNIX systems.

**LSA**

link-state advertisement. Broadcast packet used by link-state protocols that contains information about neighbors and path costs. LSAs are used by the receiving routers to maintain their routing tables. Sometimes called a *LSP*.

**LSP**

link-state packet. See *LSA*.

**LU**

logical unit. Primary component of SNA, an NAU that enables end users to communicate with each other and gain access to SNA network resources.

**LU 6.2**

Logical Unit 6.2. In SNA, an LU that provides peer-to-peer communication between programs in a distributed computing environment. APPC runs on LU 6.2 devices. See also *APPC*.

**LUNI**

LAN Emulation User-to-Network Interface. The ATM Forum standard for LAN emulation on ATM networks. Defines the interface between the LEC and the LAN Emulation Server components. See also *BUS*, *LES*, and *LECS*.





# M

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**MAC**

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

**MAC address**

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

**MAC address learning**

Service that characterizes a learning bridge, in which the source MAC address of each received packet is stored so that future packets destined for that address can be forwarded only to the bridge interface on which that address is located. Packets destined for unrecognized addresses are forwarded out every bridge interface. This scheme helps minimize traffic on the attached LANs. MAC address learning is defined in the IEEE 802.1 standard. See also *learning bridge* and *MAC address*.

**MacIP**

Network layer protocol that encapsulates IP packets in DDP packets for transmission over AppleTalk. MacIP also provides proxy ARP services. See also *DDP* and *proxy ARP*.

**MAC-layer address**

See *MAC address*.



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**MAE**

metropolitan access exchange. One of a number of Internet exchange points. Examples include MAE West and MAE East. See also *CIX*, *FIX*, and *GIX*.

**mail bridge**

Mail gateway that forwards e-mail between two or more networks while ensuring that the messages it forwards meet certain administrative criteria. A mail bridge is simply a specialized form of mail gateway that enforces an administrative policy with regard to what mail it forwards.

**mail gateway**

Machine that connects two or more electronic mail systems (especially dissimilar mail systems on two different networks) and transfers messages between them. Sometimes the mapping and translation can be quite complex, and generally it requires a store-and-forward scheme whereby the message is received from one system completely before it is transmitted to the next system after suitable translations.

**mail exchange record**

See *MX record*.

**mail exploder**

Part of an e-mail delivery system that allows a message to be delivered to a list of addressees. Mail exploders are used to implement mailing lists. Users send messages to a single address (for example, *hacks@somehost.edu*), and the mail exploder takes care of delivery to the individual mailboxes in the list.

**Maintenance Operation Protocol**

See *MOP*.

**MAN**

metropolitan-area network. Network that spans a metropolitan area. Generally, a MAN spans a larger geographic area than a LAN, but a smaller geographic area than a WAN. Compare with *LAN* and *WAN*.

**managed object**

In network management, a network device that can be managed by a network management protocol.

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**Management Information Base**

See *MIB*.

**management services**

SNA functions distributed among network components to manage and control an SNA network.

**Manchester encoding**

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

**Manufacturing Automation Protocol**

See *MAP*.

**MAP**

Manufacturing Automation Protocol. Network architecture created by General Motors to meet the specific needs of the factory floor. MAP specifies a token-passing LAN similar to IEEE 802.4. See also *IEEE 802.4*.

**MARS**

Multicast Address Resolution Server. Mechanism for supporting IP multicast. A MARS serves a group of nodes (known as a cluster); each node in the cluster is configured with the ATM address of the MARS. The MARS supports multicast through multicast messages of overlaid point-to-multipoint connections or through multicast servers.

**Martian**

Humorous term applied to packets that turn up unexpectedly on the wrong network because of bogus routing entries. Also used as a name for a packet that has an altogether bogus (nonregistered or ill-formed) Internet address.

**mask**

See *address mask* and *subnet mask*.

**MAU**

media attachment unit. Device used in Ethernet and IEEE 802.3 networks that provides the interface between the AUI port of a station and the common medium of the Ethernet. The MAU, which can be built into a station or can be a separate device, performs

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physical layer functions including the conversion of digital data from the Ethernet interface, collision detection, and injection of bits onto the network. Sometimes referred to as a *media access unit*, also abbreviated *MAU*, or as a *transceiver*. In Token Ring, a MAU is known as a *multistation access unit* and is usually abbreviated *MSAU* to avoid confusion. See also *AUI* and *MSAU*.

**maximum burst**

Specifies the largest burst of data above the insured rate that will be allowed temporarily on an ATM PVC, but will not be dropped at the edge by the traffic policing function, even if it exceeds the maximum rate. This amount of traffic will be allowed only temporarily; on average, the traffic source needs to be within the maximum rate. Specified in bytes or cells. Compare with *insured burst*. See also *maximum rate*.

**maximum rate**

Maximum total data throughput allowed on a given virtual circuit, equal to the sum of the insured and uninsured traffic from the traffic source. The uninsured data might be dropped if the network becomes congested. The maximum rate, which cannot exceed the media rate, represents the highest data throughput the virtual circuit will ever deliver, measured in bits or cells per second. Compare with *excess rate* and *insured rate*. See also *maximum burst*.

**maximum transmission unit**

See *MTU*.

**MB**

megabyte. Approximately 1,000,000 bytes.

**Mb**

megabit. Approximately 1,000,000 bits.

**MBS**

maximum burst size. In an ATM signaling message, burst tolerance is conveyed through the MBS, which is coded as a number of cells. The burst tolerance together with the SCR and the GCRA determine the MBS that can be transmitted at the peak rate and still be in conformance with the GCRA. See also *SCP* and *GCRA*.

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**MBONE**

multicast backbone. Multicast backbone of the Internet. MBONE is a virtual multicast network composed of multicast LANs and the point-to-point tunnels that interconnect them.

**Mbps**

megabits per second.

**MCA**

micro channel architecture. Bus interface commonly used in PCs and some UNIX workstations and servers.

**MCDV**

maximum cell delay variation. In an ATM network, the maximum two-point CDV objective across a link or node for the specified service category. One of four link metrics exchanged using PTSPs to determine the available resources of an ATM network. There is one MCDV value for each traffic class. See also *CDV* and *PTSP*.

**MCLR**

maximum cell loss ratio. In an ATM network, the maximum ratio of cells that do not successfully transit a link or node compared with the total number of cells that arrive at the link or node. One of four link metrics exchanged using PTSPs to determine the available resources of an ATM network. The MCLR applies to cells in the CBR and VBR traffic classes whose CLP bit is set to zero. See also *CBR*, *CLP*, *PTSP*, and *VBR*.

**MCNS**

Multimedia Cable Network System Partners Ltd. Consortium of cable companies providing service to the majority of homes in the United States and Canada. This consortium drives a standard with the goal of having interoperable cable modems.

**MCR**

minimum cell rate. Parameter defined by the ATM Forum for ATM traffic management. MCR is defined only for ABR transmissions, and specifies the minimum value for the ACR. See also *ABR* (*available bit rate*), *ACOM*, and *PCR*.

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**MCTD**

maximum cell transfer delay. In an ATM network, the sum of the MCDV and the fixed delay component across the link or node. One of four link metrics exchanged using PTSPs to determine the available resources of an ATM network. There is one MCTD value for each traffic class. See also *MCDV* and *PTSP*.

**MD**

mediation device. Device that provides protocol translation and concentration of telemetry information originating from multiple network elements and transport to an OSS. See also *OSS*.

**MD5**

Message Digest 5. Algorithm used for message authentication in SNMP v.2. MD5 verifies the integrity of the communication, authenticates the origin, and checks for timeliness. See also *SNMP2*.

**MDL**

The TransPath Message Definition Language. High-level language used to specify protocols and protocol conversion operations on the TransPath.

**MDN**

message disposition notification. Message returned to the originator of an e-mail message indicating that the e-mail message has been opened. Specifications for MDN are described in RFC 2298.

**media**

Plural of medium. Various physical environments through which transmission signals pass. Common network media include twisted-pair, coaxial, and fiber-optic cable, and the atmosphere (through which microwave, laser, and infrared transmission occurs). Sometimes called *physical media*.

**Media Access Control**

See *MAC*.

**media access unit**

See *MAU*.

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**media attachment unit**

See *MAU*.

**media interface connector**

See *MIC*.

**media rate**

Maximum traffic throughput for a particular media type.

**medium**

See *media*.

**megabit**

Abbreviated Mb. Approximately 1,000,000 bits.

**megabits per second**

Abbreviated Mbps.

**megabyte**

Abbreviated MB. Approximately 1,000,000 bytes.

**MEL CAS**

Mercury Exchange Limited (MEL) Channel Associated Signaling. A voice signaling protocol used primarily in the United Kingdom.

**mesh**

Network topology in which devices are organized in a manageable, segmented manner with many, often redundant, interconnections strategically placed between network nodes. See also *full mesh* and *partial mesh*.

**message**

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

**message handling system**

See *MHS*.

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**Message Digest 5**

See *MD5*.

**Message Queuing Interface**

See *MQI*.

**message switching**

Switching technique involving transmission of messages from node to node through a network. The message is stored at each node until such time as a forwarding path is available. Contrast with *circuit switching* and *packet switching*.

**message unit**

Unit of data processed by any network layer.

**metasignaling**

Process running at the ATM layer that manages signaling types and virtual circuits.

**metering**

See *traffic shaping*.

**metric**

See *routing metric*.

**metropolitan-area network**

See *MAN*.

**MFT**

multiflex trunk module.

**MHS**

message handling system. ITU-T X.400 recommendations that provide message handling services for communications between distributed applications. NetWare MHS is a different (though similar) entity that also provides message-handling services. See also *IFIP*.

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**MIB**

Management Information Base. Database of network management information that is used and maintained by a network management protocol such as SNMP or CMIP. The value of a MIB object can be changed or retrieved using SNMP or CMIP commands, usually through a GUI network management system. MIB objects are organized in a tree structure that includes public (standard) and private (proprietary) branches.

**MIC**

media interface connector. FDDI *de facto* standard connector.

**MICA**

Modem ISDN channel aggregation. Modem module and card used in the Cisco AS5300 universal access servers. A MICA modem provides an interface between an incoming or outgoing digital call and an Integrated Services Digital Network (ISDN) telephone line; the call does not have to be converted to analog, as it does with a conventional modem and an analog telephone line. Each line can accommodate, or aggregate, up to 24 (T1) or 30 (E1) calls.

**microfilter**

Device that prevents data frequencies (intended for a data device such as a router) from traveling over the telephone line and interfering with telephone calls.

**MID**

message identifier. In ATM, used to identify ATM cells that carry segments from the same higher-layer packet.

**micro channel architecture**

See *MCA*.

**microcode**

Translation layer between machine instructions and the elementary operations of a computer. Microcode is stored in ROM and allows the addition of new machine instructions without requiring that they be designed into electronic circuits when new instructions are needed.

**microsegmentation**

Division of a network into smaller segments, usually with the intention of increasing aggregate bandwidth to network devices.



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**microwave**

Electromagnetic waves in the range 1 to 30 GHz. Microwave-based networks are an evolving technology gaining favor due to high bandwidth and relatively low cost.

**mid-level network**

mid-level networks. Makes up the second level of the Internet hierarchy. They are the transit networks that connect the stub networks to the backbone networks. Also referred to as *regionals*.

**midsplit**

Broadband cable system in which the available frequencies are split into two groups: one for transmission and one for reception.

**MII**

media independent interface. Standard specification for the interface between network controller chips and their associated media interface chip(s). The MII automatically senses 10- and 100-MHz Ethernet speeds.

**Military Network**

See *MILNET*.

**millions of instructions per second**

See *mips*.

**MILNET**

Military Network. Unclassified portion of the DDN. Operated and maintained by the DISA. See also *DDN* and *DISA*.

**MIME**

Multipurpose Internet Mail Extension. MIME. Sstandard for transmitting non-text data (or data that cannot be represented in plain ASCII code) in Internet mail, such as binary, foreign language text (such as Russian or Chinese), audio, or video data. MIME is defined in RFC 2045.

**minimum cell rate**

See *MCR*.

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**MIP**

See *MIP* (MultiChannel Interface Processor) in the “Cisco Systems Terms and Acronyms” section.

**mips**

millions of instructions per second. Number of instructions executed by a processor per second.

**MIX**

multiservice interchange.

**MLP**

Multilink PPP. Method of splitting, recombining, and sequencing datagrams across multiple logical data links.

**MMF**

multimode fiber.

**MML**

TransPath Man-Machine Language.

**MMoIP**

Multimedia Mail over IP.

**MMoIP dial peer**

Multimedia Mail over Internet Protocol dial peer. Dial peer specific to Store and Forward Fax. The MMoIP dial peer is the vehicle you use to assign particular line characteristics (such as a destination telephone number) to the connection between the Cisco router or access server and the SMTP mail server during on-ramp faxing.

**MMP**

Multichassis Multilink PPP. Extends MLP support across multiple routers and access servers. MMP enables multiple routers and access servers to operate as a single, large dial-up pool, with a single network address and ISDN access number. MMP correctly handles packet fragmenting and reassembly when a user connection is split between two physical access devices.

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**modem**

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

**modem eliminator**

Device allowing connection of two DTE devices without modems.

**modulation**

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

**modulator-demodulator**

See *modem*.

**monomode fiber**

See *single-mode fiber*.

**MOP**

Maintenance Operation Protocol. Digital Equipment Corporation protocol that provides a way to perform primitive maintenance operations on DECnet systems. For example, MOP can be used to download a system image to a diskless station.

**Mosaic**

Public-domain WWW browser, developed at the NCSA. See also *browser*.

**MOSPF**

Multicast OSPF. Intradomain multicast routing protocol used in OSPF networks. Extensions are applied to the base OSPF unicast protocol to support IP multicast routing.

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**MPEG**

*Motion Picture Experts Group. Standard for compressing video. MPEG1 is a bit stream standard for compressed video and audio optimized to fit into a bandwidth of 1.5 Mbps. MPEG2 is intended for higher quality video-on-demand applications and runs at data rates between 4 and 9 Mbps. MPEG4 is a low-bit-rate compression algorithm intended for 64-kbps connections.*

**MPLS**

Multiprotocol Label Switching. Emerging industry standard upon which tag switching is based.

**MPOA**

Multiprotocol over ATM. ATM Forum standardization effort specifying how existing and future network-layer protocols such as IP, IPv6, AppleTalk, and IPX run over an ATM network with directly attached hosts, routers, and multilayer LAN switches.

**MQI**

Message Queuing Interface. International standard API that provides functionality similar to that of the RPC interface. In contrast to RPC, MQI is implemented strictly at the application layer. See also *RPC*.

**MSAU**

multistation access unit. Wiring concentrator to which all end stations in a Token Ring network connect. The MSAU provides an interface between these devices and the Token Ring interface of a router. Sometimes abbreviated *MAU*.

**MSO**

multiple service operator. Cable service provider that also provides other services such as data and/or voice telephony.

**MTA**

1. Message Transfer Agent. OSI application process used to store and forward messages in the X.400 Message Handling System. Equivalent to Internet mail agent.

2. Mail Transfer Agent. Software that implements SMTP and provides storage for mail messages to be forwarded or delivered to a local user. MTAs implement SMTP (RFC 821).

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**MTBF**

meantime between failure.

**MTU**

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

**MUD**

multi-user dungeon. Adventure, role playing games, or simulations played on the Internet. Players interact in real time and can change the “world” in the game as they play it. Most MUDs are based on the Telnet protocol.

**mu-law**

North American companding standard used in conversion between analog and digital signals in PCM systems. Similar to the European a-law. See also *a-law* and *companding*.

**multiaccess network**

Network that allows multiple devices to connect and communicate simultaneously.

**multicast**

Single packets copied by the network and sent to a specific subset of network addresses. These addresses are specified in the Destination Address Field. Compare with *broadcast* and *unicast*.

**multicast address**

Single address that refers to multiple network devices. Synonymous with group address. Compare with *broadcast address* and *unicast address*. See also *multicast*.

**multicast backbone**

See *MBONE*.

**multicast forward VCC**

VCC set up by the BUS to the LEC as a leaf in a point-to-multipoint connection. See also *BUS*, *LEC* (LAN Emulation Client), and *VCC*.

**multicast group**

Dynamically determined group of IP hosts identified by a single IP multicast address.

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**Multicast OSPF**

See *MOSPF*.

**multicast router**

Router used to send IGMP query messages on their attached local networks. Host members of a multicast group respond to a query by sending IGMP reports noting the multicast groups to which they belong. The multicast router takes responsibility for forwarding multicast datagrams from one multicast group to all other networks that have members in the group. See also *IGMP*.

**multicast send VCC**

In an ATM network, a bi-directional point-to-point VCC set up by a LEC to a BUS. One of three data connections defined by Phase 1 LANE. Compare with *control distribute VCC* and *control direct VCC*. See also *BUS*, *LEC* (LAN Emulation Client), and *VCC*.

**multicast server**

Establishes a one-to-many connection to each device in a VLAN, thus establishing a broadcast domain for each VLAN segment. The multicast server forwards incoming broadcasts only to the multicast address that maps to the broadcast address.

**MultiChannel Interface Processor**

See *MIP* in the “Cisco Systems Terms and Acronyms” section.

**multidrop line**

Communications line with multiple cable access points. Sometimes called a multipoint line.

**multihomed host**

Host attached to multiple physical network segments in an OSI CLNS network.

**multihoming**

Addressing scheme in IS-IS routing that supports assignment of multiple area addresses.

**multilayer switch**

Switch that filters and forwards packets based on MAC addresses and network addresses. A subset of LAN switch. Compare with *LAN switch*.

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**multimode fiber**

Optical fiber supporting propagation of multiple frequencies of light. See also *single-mode fiber*.

**multiple domain network**

SNA network with multiple SSCPs. See also *SSCP*.

**multiplexing**

Scheme that allows multiple logical signals to be transmitted simultaneously across a single physical channel. Compare with *demultiplexing*.

**Multipoint.**

1. Line or channel connecting three or more different service points.
2. Circuit that has points served by three or more switches. Single communications channel (typically a leased telephone circuit) to which two or more stations or logical units are attached although only one can transmit at a time. Such arrangements usually require a polling mechanism under the control of a master station to ensure that only one device transmits at a time.

**multipoint control unit**

Endpoint on the LAN that provides the capability for three or more terminals and gateways to participate in a multipoint conference.

**multipoint line**

See *multidrop line*.

**Multiprotocol over ATM**

See *MPOA*.

**Multipurpose Internet Mail Extension**

See *MIME*.

**multistation access unit**

See *MSAU*.

**multi-user dungeon**

See *MUD*.

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**multivendor network**

Network using equipment from more than one vendor. Multivendor networks pose many more compatibility problems than single-vendor networks. Compare with *single-vendor network*.

**mux**

multiplexing device. Combines multiple signals for transmission over a single line. The signals are demultiplexed, or separated, at the receiving end.

**MX record**

mail exchange record. DNS resource record type indicating which host can handle e-mail for a particular domain.







# N

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**NACS**

NetWare Asynchronous Communication Services. Novell software that supports Novell's AIO and NASI programming interfaces. NACS promotes the sharing of communications resources such as modems, asynchronous hosts, and X.25 network services.

**NADF**

North American Directory Forum. Collection of organizations that offer, or plan to offer, public directory services in North America, based on the CCITT X.500 Recommendations.

**NADN**

nearest active downstream neighbor. In Token Ring or IEEE 802.5 networks, the closest downstream network device from any given device that is still active.

**Nagle's algorithm**

Actually two separate congestion control algorithms that can be used in TCP-based networks. One algorithm reduces the sending window; the other limits small datagrams.

**NAK**

negative acknowledgment. Response sent from a receiving device to a sending device indicating that the information received contained errors. Compare to *acknowledgment*.

**Name Binding Protocol**

See *NBNS*.

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**name caching**

Method by which remotely discovered host names are stored by a router for use in future packet-forwarding decisions to allow quick access.

**name resolution**

Generally, the process of associating a name with a network location.

**name server**

Server connected to a network that resolves network names into network addresses.

**namespace**

Commonly distributed set of names in which all names are unique.

**NANOG**

North American Network Operator's Group. Primary forum for information exchange among U.S. exchange point participants, Internet service providers, and end users.

**NANP**

North American Numbering Plan.

**NAP**

network access point. Location for interconnection of Internet service providers in the United States for the exchange of packets.

**NARP**

NBMA Address Resolution Protocol. Functional subset of NHRP that returns only the address mappings of nodes that are directly connected to the NBMA network. Compare with *NHRP*.

**narrowband**

See *baseband*.

**Narrowband ISDN**

See *N-ISDN*.

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**NAS**

network access server. Cisco platform (or collection of platforms such as an AccessPath system which interfaces between the packet world (e.g. the Internet) and the circuit world (e.g. the PSTN). (See *access device*.)

**NAS**

network access server. A NAS1

NetWare Asynchronous Support Interface.

**NAT**

Network Address Translation. Mechanism for reducing the need for globally unique IP addresses. NAT allows an organization with addresses that are not globally unique to connect to the Internet by translating those addresses into globally routable address space. Also known as *Network Address Translator*.

**National Bureau of Standards**

See *NBS*.

**National Institute of Standards and Technology**

See *NIST*.

**National Research and Education Network**

See *NREN*.

**National Science Foundation**

See *NSF*.

**National Science Foundation Network**

See *NSFNET*.

**native client interface architecture**

See *NCIA* in the “Cisco Systems Terms and Acronyms” section.

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**NAU**

network addressable unit. SNA term for an addressable entity. Examples include LUs, PUs, and SSCPs. NAUs generally provide upper-level network services. Compare with *path control network*.

**NAUN**

nearest active upstream neighbor. In Token Ring or IEEE 802.5 networks, the closest upstream network device from any given device that is still active.

**NBFCP**

NetBIOS Frames Control Protocol. Protocol that establishes and configures NetBIOS over PPP. See also *NetBIOS* and *PPP*.

**NBMA**

nonbroadcast multiaccess. Term describing a multiaccess network that either does not support broadcasting (such as X.25) or in which broadcasting is not feasible (for example, an SMDS broadcast group or an extended Ethernet that is too large). See also *multiaccess network*.

**NBNS**

NetBIOS Name Service.

**NBP**

Name Binding Protocol. AppleTalk transport-level protocol that translates a character string name into the DDP address of the corresponding socket client. NBP enables AppleTalk protocols to understand user-defined zones and device names by providing and maintaining translation tables that map names to their corresponding socket addresses.

**NBS**

National Bureau of Standards. Organization that was part of the U.S. Department of Commerce. Now known as NIST. See also *NIST*.

**NCIA**

See *NCIA* (native client interface architecture) in the “Cisco Systems Terms and Acronyms” section.

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**NCP**

1. Network Control Program. In SNA, a program that routes and controls the flow of data between a communications controller (in which it resides) and other network resources.

2. Network Control Protocol. Series of protocols for establishing and configuring different network layer protocols, such as for AppleTalk over PPP. See also *PPP*.

**NCP/Token Ring Interconnection**

See *NTRI*.

**NCSA**

National Center for Supercomputing Applications.

**NDIS**

network driver interface specification. Microsoft specification for a generic, hardware- and protocol-independent device driver for NICs.

**NE**

network element. In OSS, a single piece of telecommunications equipment used to perform a function or service integral to the underlying network.

**nearest active upstream neighbor**

See *NAUN*.

**NEARNET**

Regional network in New England (United States) that links Boston University, Harvard University, and MIT. Now part of BBN Planet. See also *BBN Planet*.

**NEBS**

Network Equipment Building Systems. In OSS, the Bellcore requirement for equipment deployed in a central office environment. Covers spatial, hardware, crafts person interface, thermal, fire resistance, handling and transportation, earthquake and vibration, airborne contaminants, grounding, acoustical noise, illumination, EMC, and ESD requirements.

**negative acknowledgment**

See *NAK*.

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**neighboring routers**

In OSPF, two routers that have interfaces to a common network. On multiaccess networks, neighbors are dynamically discovered by the OSPF Hello protocol.

**NEMS**

Network Element Management Server.

**NET**

network entity title. Network addresses, defined by the ISO network architecture, and used in CLNS-based networks.

**net**

Short for *Network*.

**NetBEUI**

NetBIOS Extended User Interface. Enhanced version of the NetBIOS protocol used by network operating systems such as LAN Manager, LAN Server, Windows for Workgroups, and Windows NT. NetBEUI formalizes the transport frame and adds additional functions. NetBEUI implements the OSI LLC2 protocol. See also *LLC2* and *OSI*.

**NetBIOS**

Network Basic Input/Output System. API used by applications on an IBM LAN to request services from lower-level network processes. These services might include session establishment and termination, and information transfer.

**netiquette**

A pun on “etiquette” referring to proper behavior on a network.

**NETscout**

See *NETscout* in the “Cisco Systems Terms and Acronyms” section.

**NetView**

IBM network management architecture and related applications. NetView is a VTAM application used for managing mainframes in SNA networks. See also *VTAM*.



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**NetWare**

Popular distributed NOS developed by Novell. Provides transparent remote file access and numerous other distributed network services.

**NetWare Link Services Protocol**

See *NLSP*.

**NetWare Loadable Module**

See *NLM*.

**Network**

The highest level of your signaling controller system. You have only one network, within which you create your sites.

**network**

Collection of computers, printers, routers, switches, and other devices that are able to communicate with each other over some transmission medium.

**network access point**

See *NAP*.

**network access server**

See *access server* and *NAS*.

**network address**

Network layer address referring to a logical, rather than a physical, network device. Also called a *protocol address*. Compare with *MAC address*.

**Network Address Translation**

See *NAT*.

**Network Address Translator**

See *NAT*.

**network addressable unit**

See *NAU*.

---

**network administrator**

Person responsible for the operation, maintenance, and management of a network. See also *network operator*.

**network analyzer**

Hardware or software device offering various network troubleshooting features, including protocol-specific packet decodes, specific preprogrammed troubleshooting tests, packet filtering, and packet transmission.

**Network Basic Input/Output System**

See *NetBIOS*.

**network byte order**

Internet-standard ordering of the bytes corresponding to numeric values.

**Network Control Program**

See *NCP*.

**network driver interface specification**

See *NDIS*.

**network entity title**

See *NET*.

**Network File System**

See *NFS*.

**Network Indicator**

Determines the type of call that is being placed: 0 = international, 1 = reserved, 2 = national, and 3 = national spare.

**Network Information Center**

See *InterNIC*.

**Network Information Service**

See *NIS*.

---

**network interface**

Boundary between a carrier network and a privately-owned installation.

**network interface card**

See *NIC*.

**network layer**

Layer 3 of the OSI reference model. This layer provides connectivity and path selection between two end systems. The network layer is the layer at which routing occurs. Corresponds roughly with the *path control layer* of the SNA model. See also *application layer*, *data-link layer*, *physical layer*, *PQ*, *session layer*, and *transport layer*.

**network management**

Generic term used to describe systems or actions that help maintain, characterize, or troubleshoot a network.

**Network Management Processor**

See *NMP*.

**network management system**

See *NMS*.

**network management vector transport**

See *NMVT*.

**Network-to-Network Interface**

See *NNI*.

**network node**

See *NN*.

**network node interface**

See *NNI*.

**Network Node Server**

SNA NN that provides resource location and route selection services for ENs, LEN nodes, and LUs that are in its domain.

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**network number**

Part of an IP address that specifies the network to which the host belongs.

**network operating system**

See *NOS*.

**Network Operations Center**

See *NOC*.

**network operator**

Person who routinely monitors and controls a network, performing such tasks as reviewing and responding to traps, monitoring throughput, configuring new circuits, and resolving problems. See also *network administrator*.

**network service access point**

See *NSAP*.

**network termination device 1**

See *NT-1*.

**Network Time Protocol**

See *NTP*.

**network-visible entity**

See *NVE*.

**Next Hop Resolution Protocol**

See *NHRP*.

**NFS**

Network File System. As commonly used, a distributed file system protocol suite developed by Sun Microsystems that allows remote file access across a network. In actuality, NFS is simply one protocol in the suite. NFS protocols include NFS, RPC, XDR, and others. These protocols are part of a larger architecture that Sun refers to as *ONC*. See also *ONC*.

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**NHRP**

Next Hop Resolution Protocol. Protocol used by routers to dynamically discover the MAC address of other routers and hosts connected to a NBMA network. These systems can then directly communicate without requiring traffic to use an intermediate hop, increasing performance in ATM, Frame Relay, SMDS, and X.25 environments.

**NHS**

Next Hop Server. Server defined by the NHRP protocol that maintains next-hop resolution cache tables containing the IP-to-ATM address mappings of associated nodes and nodes that are reachable through routers served by the NHS.

**NIC**

1. network interface card. Board that provides network communication capabilities to and from a computer system. Also called an *adapter*. See also *AUI*.

2. Network Information Center. Organization whose functions have been assumed by the InterNIC. See *InterNIC*.

**NIS**

Network Information Service. Protocol developed by Sun Microsystems for the administration of network-wide databases. The service essentially uses two programs: one for finding a NIS server and one for accessing the NIS databases.

**N-ISDN**

Narrowband ISDN. Communication standards developed by the ITU-T for baseband networks. Based on 64-kbps B channels and 16- or 64-kbps D channels. Contrast with *BISDN*. See also *BRI*, *ISDN*, and *PRI*.

**NIST**

National Institute of Standards and Technology. U.S. government organization that supports and catalogs a variety of standards. Formerly the NBS. See also *NBS*.

**NLM**

NetWare Loadable Module. Individual program that can be loaded into memory and function as part of the NetWare NOS.

---

**NLSP**

NetWare Link Services Protocol. Link-state routing protocol based on IS-IS. See also *IS-IS*.

**NMA**

Network Management and Analysis. Bellcore OSS providing alarm surveillance and performance monitoring of intelligent network elements.

**NMP**

See *NMP* (Network Management Processor) in the “Cisco Systems Terms and Acronyms” section.

**NMS**

network management system. System responsible for managing at least part of a network. An NMS is generally a reasonably powerful and well-equipped computer such as an engineering workstation. NMSs communicate with agents to help keep track of network statistics and resources.

**NMVT**

network management vector transport. SNA message consisting of a series of vectors conveying network management specific information.

**NN**

network node. SNA intermediate node that provides connectivity, directory services, route selection, intermediate session routing, data transport, and network management services to LEN nodes and ENs. The NN contains a CP that manages the resources of both the NN itself and those of the ENs and LEN nodes in its domain. NNs provide intermediate routing services by implementing the APPN PU 2.1 extensions. Compare with *EN*. See also *CP*.

**NNI**

1. Network-to-Network Interface. ATM Forum standard that defines the interface between two ATM switches that are both located in a private network or are both located in a public network. The interface between a public switch and private one is defined by the UNI standard. Also, the standard interface between two Frame Relay switches meeting the same criteria. Compare with *UNI*.

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2. network node interface.

**NOA**

nature of address.

**NOC**

network operations center. Organization responsible for maintaining a network.

**node**

1. Endpoint of a network connection or a junction common to two or more lines in a network. Nodes can be processors, controllers, or workstations. Nodes, which vary in routing and other functional capabilities, can be interconnected by links, and serve as control points in the network. Node is sometimes used generically to refer to any entity that can access a network, and is frequently used interchangeably with device. See also *host*.

2. H.323 entity that uses RAS to communicate with the gatekeeper (for example, an endpoint such as a terminal, proxy, or gateway).

3. In SNA, the basic component of a network and the point at which one or more functional units connect channels or data circuits.

**node**

**noise**

Undesirable communications channel signals.

**nonbroadcast multiaccess**

See *NBMA*.

**nonextended network**

AppleTalk Phase 2 network that supports addressing of up to 253 nodes and only 1 zone.

**nonreturn to zero**

See *NRZ*.

---

**nonreturn to zero inverted**

See *NRZI*.

**nonseed router**

In AppleTalk, a router that must first obtain, and then verify, its configuration with a seed router before it can begin operation. See also *seed router*.

**non-stub area**

Resource-intensive OSPF area that carries a default route, static routes, intra-area routes, interarea routes, and external routes. Nonstub areas are the only OSPF areas that can have virtual links configured across them, and are the only areas that can contain an ASBR. Compare with *stub area*. See also *ASAM* and *OSPF*.

**nonvolatile random-access memory**

See *NVRAM*.

**normal response mode**

See *NRM*.

**Northwest Net**

NSF-funded regional network serving the Northwestern United States, Alaska, Montana, and North Dakota. Northwest Net connects all major universities in the region as well as many leading industrial concerns.

**NOS**

network operating system. Generic term used to refer to what are really distributed file systems. Examples of NOSs include LAN Manager, NetWare, NFS, and VINES.

**Novell IPX**

See *IPX*.

**NPI**

number plan identification.



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**NREN**

National Research and Education Network. Component of the HPCC program designed to ensure U.S. technical leadership in computer communications through research and development efforts in state-of-the-art telecommunications and networking technologies. See also *HPCC*.

**NRM**

normal response mode. HDLC mode for use on links with one primary station and one or more secondary stations. In this mode, secondary stations can transmit only if they first receive a poll from the primary station.

**NRZ**

nonreturn to zero. Signals that maintain constant voltage levels with no signal transitions (no return to a zero-voltage level) during a bit interval. Compare with *NRZI*.

**NRZI**

nonreturn to zero inverted. Signals that maintain constant voltage levels with no signal transitions (no return to a zero-voltage level), but interpret the presence of data at the beginning of a bit interval as a signal transition and the absence of data as no transition. Compare with *NRZ*.

**NSAP**

network service access point. Network addresses, as specified by ISO. An NSAP is the point at which OSI Network Service is made available to a transport layer (Layer 4) entity.

**NSF**

National Science Foundation. U.S. government agency that funds scientific research in the United States. The now-defunct NSFNET was funded by the NSF. See also *NSFNET*.

**NSFNET**

National Science Foundation Network. Large network that was controlled by the NSF and provided networking services in support of education and research in the United States, from 1986 to 1995. NSFNET is no longer in service.

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**NT-1**

network termination 1. In ISDN, a device that provides the interface between customer premises equipment and central office switching equipment.

**NTP**

Network Time Protocol. Protocol built on top of TCP that assures accurate local time-keeping with reference to radio and atomic clocks located on the Internet. This protocol is capable of synchronizing distributed clocks within milliseconds over long time periods.

**NTRI**

NCP/Token Ring Interconnection. Function used by ACF/NCP to support Token Ring-attached SNA devices. NTRI also provides translation from Token Ring-attached SNA devices (PUs) to switched (dial-up) devices.

**null modem**

Small box or cable used to join computing devices directly, rather than over a network.

**NVE**

network-visible entity. Resource that is addressable through a network. Typically, an NVE is a socket client for a service available in a node.

**NVRAM**

nonvolatile RAM. RAM that retains its contents when a unit is powered off.

**NYSERNet**

Network in New York (United States) with a T1 backbone connecting NSF, many universities, and several commercial concerns.

# O

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**OAM cell**

operation, administration, and maintenance cell. ATM Forum specification for cells used to monitor virtual circuits. OAM cells provide a virtual circuit-level loopback in which a router responds to the cells, demonstrating that the circuit is up, and the router is operational.

**OAM&P**

operations administration maintenance and provisioning.

**OARnet**

Ohio Academic Resources Network. Internet service provider that connects a number of U.S. sites, including the Ohio supercomputer center in Columbus, Ohio.

**object instance**

Network management term referring to an instance of an object type that has been bound to a value.

**OC**

optical carrier. Series of physical protocols (OC-1, OC-2, OC-3, and so forth), defined for SONET optical signal transmissions. OC signal levels put STS frames onto multimode fiber-optic line at a variety of speeds. The base rate is 51.84 Mbps (OC-1); each signal level thereafter operates at a speed divisible by that number (thus, OC-3 runs at 155.52 Mbps). See also *SONET*, *STS-1*, and *STS-3c*.

**OCC**

originating call control.

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**OCLC**

Online Computer Library Catalog. Nonprofit membership organization offering computer-based services to libraries, educational organizations, and their users.

**octet**

8 bits. In networking, the term octet is often used (rather than byte) because some machine architectures employ bytes that are not 8 bits long.

**ODA**

Open Document Architecture. ISO standard that specifies how documents are represented and transmitted electronically. Formerly called *Office Document Architecture*.

**ODBC**

Open DataBase Connectivity. Standard application programming interface for accessing data in both relational and nonrelational database management systems. Using this application programming interface, database applications can access data stored in database management systems on a variety of computers even if each database management system uses a different data storage format and programming interface. ODBC is based on the call level interface specification of the X/Open SQL Access Group and was developed by Digital Equipment Corporation, Lotus, Microsoft, and Sybase. Contrast with *JDBC*.

**ODI**

Open Data-Link Interface. Novell specification providing a standardized interface for NICs (network interface cards) that allows multiple protocols to use a single NIC. See also *NIC*.

**OEMI channel**

See *block multiplexer channel*.

**Office Document Architecture**

See *ODA*.

**Ohio Academic Resources Network**

See *OARnet*.

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**OIM**

OSI Internet Management. Group tasked with specifying ways in which OSI network management protocols can be used to manage TCP/IP networks.

**OIR**

online insertion and removal. Feature that permits the addition, replacement, or removal of cards without interrupting the system power, entering console commands, or causing other software or interfaces to shut down. Sometimes called *hot swapping or power-on servicing*.

**OLO**

other local operator.

**OMG**

Object Management Group.

**ONC**

Open Network Computing. Distributed applications architecture designed by Sun Microsystems, currently controlled by a consortium led by Sun. The NFS protocols are part of ONC. See also *NFS*.

**ones density**

Scheme that allows a CSU/DSU to recover the data clock reliably. The CSU/DSU derives the data clock from the data that passes through it. In order to recover the clock, the CSU/DSU hardware must receive at least one 1 bit value for every 8 bits of data that pass through it. Also called *pulse density*.

**online insertion and removal**

See *OIR*.

**on-the-fly packet switching**

See *cut-through packet switching*.

**OOS**

1. Out-of-Service.
2. Telecommunications: Out-of-Service signaling.

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**OPC**

own point code. Point code of the Cisco SC2200 signaling controller.

**open architecture**

Architecture with which third-party developers can legally develop products and for which public domain specifications exist.

**open circuit**

Broken path along a transmission medium. Open circuits will usually prevent network communication.

**open database connectivity**

See *ODBC*.

**Open Data-Link Interface**

See *ODI*.

**Open Document Architecture**

See *ODA*.

**Open Group**

Group formed in February 1996 by the consolidation of the two leading open systems consortia: X/Open Company Ltd (X/Open) and the Open Software Foundation (OSF).

**Open Network Computing**

See *ONC*.

**Open Shortest Path First**

See *OSPF*.

**Open System Interconnection**

See *OSI*.

**Open System Interconnection reference model**

See *OSI reference model*.

**Operation, Administration, and Maintenance cell**

See *OAM cell*.

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**OPS/INE**

Operations Provisioning System/Intelligent Network Element. Bellcore OSS that provides provisioning services for intelligent network elements. See also *OSS*.

**Optical Carrier**

See *OC*.

**optical fiber**

See *fiber-optic cable*.

**Optimized Bandwidth Management**

Cisco wide-area switches ensure fair and cost-efficient bandwidth utilization using various techniques. ABR and Optimized Bandwidth Management are used for ATM and Frame Relay traffic. ABR is a standards-based ATM traffic management mechanism, and ForeSight is Cisco's implementation that mirrors ABR capabilities for Frame Relay traffic. ABR and Optimized Bandwidth Management optimize real-time traffic performance and throughput, and minimize data loss. Bandwidth management for voice is achieved through the use of standards-based voice compression and silence suppression mechanisms for circuit data services. Formerly called ForeSight.

**Organizational Unique Identifier**

See *OUI*.

**OSF**

Open Software Foundation. Group responsible for the Distributed Computing Environment (DCE) and the Distributed Management Environment (DME). See *DCE*.

**OSI**

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

**OSI Internet Management**

See *OIM*.

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**OSI network address**

Address, consisting of up to 20 octets, used to locate an OSI Transport entity. The address is formatted into two parts: an Initial Domain Part that is standardized for each of several addressing domains and a Domain Specific Part that is the responsibility of the addressing authority for that domain.

**OSI presentation address**

Address used to locate an OSI Application entity. It consists of an OSI Network Address and up to three selectors, one each for use by the transport, session, and presentation entities.

**OSI reference model**

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

**OSINET**

International association designed to promote OSI in vendor architectures.

**OSPF**

Open Shortest Path First. Link-state, hierarchical IGP routing algorithm proposed as a successor to RIP in the Internet community. OSPF features include least-cost routing, multipath routing, and load balancing. OSPF was derived from an early version of the IS-IS protocol. See also *IGP*, *IS-IS*, and *RIP*. See also *Enhanced IGRP* and *IGRP* (Interior Gateway Routing Protocol) in the “Cisco Systems Terms and Acronyms” section.



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**OSS**

Operations Support System. Network management system supporting a specific management function, such as alarm surveillance and provisioning, in a carrier network. Many OSSs are large centralized systems running on mainframes or minicomputers. Common OSSs used within an RBOC include *NMA*, *OPS/INE*, and *TIRKS*.

**OUI**

Organizational Unique Identifier. 3 octets assigned by the IEEE in a block of 48-bit LAN addresses.

**outframe**

Maximum number of outstanding frames allowed in an SNA PU 2 server at any time.

**out-of-band signaling**

Transmission using frequencies or channels outside the frequencies or channels normally used for information transfer. Out-of-band signaling is often used for error reporting in situations in which in-band signaling can be affected by whatever problems the network might be experiencing. Contrast with *in-band signaling*.



# P

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**PABX**

private automatic branch exchange. Telephone switch for use inside a corporation. PABX is the preferred term in Europe, while PBX is used in the United States.

 **pacing**

See *flow control*.

**packet**

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

**packet assembler/disassembler**

See *PAD*.

**packet buffer**

See *buffer*.

**packet internet groper**

See *ping*.

**packet level protocol**

See *PLP*.

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**packet switch**

WAN device that routes packets along the most efficient path and allows a communications channel to be shared by multiple connections. Formerly called an IMP. See also *IMP*.

**packet switch exchange**

See *PSE*.

**packet-switched data network**

See *PSN*.

**packet-switched network**

See *PSN*.

**packet switching**

Networking method in which nodes share bandwidth with each other by sending packets. Compare with *circuit switching* and *message switching*. See also *PSN*.

**packet-switching node**

See *packet switch*.

**PAD**

packet assembler/disassembler. Device used to connect simple devices (like character-mode terminals) that do not support the full functionality of a particular protocol to a network. PADs buffer data and assemble and disassemble packets sent to such end devices.

**Palo Alto Research Center**

See *PARC*.

**PAM**

pulse amplitude modulation. Modulation scheme where the modulating wave is caused to modulate the amplitude of a pulse stream. Compare with *AM* and *FM*. See also *modulation*.

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**PAP**

Password Authentication Protocol. Authentication protocol that allows PPP peers to authenticate one another. The remote router attempting to connect to the local router is required to send an authentication request. Unlike CHAP, PAP passes the password and host name or username in the clear (unencrypted). PAP does not itself prevent unauthorized access, but merely identifies the remote end. The router or access server then determines if that user is allowed access. PAP is supported only on PPP lines. Compare with *CHAP*.

**parallel channel**

Channel that uses bus and tag cables as a transmission medium. Compare with *ESCON channel*. See also *bus and tag channel*.

**parallelism**

Indicates that multiple paths exist between two points in a network. These paths might be of equal or unequal cost. Parallelism is often a network design goal: if one path fails, there is redundancy in the network to ensure that an alternate path to the same point exists.

**parallel transmission**

Method of data transmission in which the bits of a data character are transmitted simultaneously over a number of channels. Compare with *serial transmission*.

**PARC**

Palo Alto Research Center. Research and development center operated by XEROX. A number of widely-used technologies were originally conceived at PARC, including the first personal computers and LANs.

**PARC Universal Protocol**

See *PUP*.

**parent peer group**

In ATM, a peer group that acts as a “parent” to a subordinate peer group. Organizing peer groups hierarchically reduces the exchange of PTSPs. See also *child peer group*, *peer group*, and *PTSP*.

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**parity check**

Process for checking the integrity of a character. A parity check involves appending a bit that makes the total number of binary 1 digits in a character or word (excluding the parity bit) either odd (for *odd parity*) or even (for *even parity*).

**partial mesh**

Network in which devices are organized in a mesh topology, with some network nodes organized in a full mesh, but with others that are only connected to one or two other nodes in the network. A partial mesh does not provide the level of redundancy of a full mesh topology, but is less expensive to implement. Partial mesh topologies are generally used in the peripheral networks that connect to a fully meshed backbone. See also *full mesh* and *mesh*.

**Password Authentication Protocol**

See *PAP*.

**path control layer**

Layer 3 in the SNA architectural model. This layer performs sequencing services related to proper data reassembly. The path control layer is also responsible for routing. Corresponds roughly with the *network layer* of the OSI model. See also *data flow control layer*, *data-link control layer*, *physical control layer*, *presentation services layer*, *transaction services layer*, and *transmission control layer*.

**path control network**

SNA concept that consists of lower-level components that control the routing and data flow through an SNA network and handle physical data transmission between SNA nodes. Compare with *NAU*.

**path cost**

See *cost*.

**path name**

Full name of a DOS, Mac OS, or UNIX file or directory, including all directory and subdirectory names. Consecutive names in a path name are typically separated by a backslash (\) for DOS, a colon (:) for Mac OS, and a forward slash (/) for UNIX.

**payload**

Portion of a cell, frame, or packet that contains upper-layer information (data).

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**payload type identifier**

See *PTI*.

**PBX**

private branch exchange. Digital or analog telephone switchboard located on the subscriber premises and used to connect private and public telephone networks.

**PCI**

protocol control information. Control information added to user data to comprise an OSI packet. The OSI equivalent of the term header. See also *header*.

**PCM**

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

**PCR**

peak cell rate. Parameter defined by the ATM Forum for ATM traffic management. In CBR transmissions, PCR determines how often data samples are sent. In ABR transmissions, PCR determines the maximum value of the ACR. See also *ABR* (*available bit rate*), *ACOM*, and *CBR*.

**PCS**

1. Personal Communications Service. Advanced network architecture that provides personal, terminal, and service mobility. In the United States, PCS spectrum has been allocated for broadband, narrowband, and unlicensed services.

2. port concentrator switch.

**PDN**

public data network. Network operated either by a government (as in Europe) or by a private concern to provide computer communications to the public, usually for a fee. PDNs enable small organizations to create a WAN without all the equipment costs of long-distance circuits.

**PDU**

protocol data unit. OSI term for packet. See also *BPDU* and *packet*.

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**peak cell rate**

See *PCR*.

**peak rate**

Maximum rate, in kilobits per second, at which a virtual circuit can transmit.

**peer-to-peer computing**

Calls for each network device to run both client and server portions of an application. Also describes communication between implementations of the same OSI reference model layer in two different network devices. Compare with *client/server computing*.

**peer group**

Collection of ATM nodes that share identical topological databases and exchange full link state information with each other. Peer groups are arranged hierarchically to prevent excessive PTSP traffic. See also *parent peer group* and *PTSP*.

**peer group leader**

See *PGL*.

**PEM**

privacy enhanced mail. Internet e-mail that provides confidentiality, authentication, and message integrity using various encryption methods. Not widely deployed in the Internet.

**performance management**

One of five categories of network management defined by ISO for management of OSI networks. Performance management subsystems are responsible for analyzing and controlling network performance including network throughput and error rates. See also *accounting management*, *configuration management*, *fault management*, and *security management*.

**peripheral node**

In SNA, a node that uses local addresses and is therefore not affected by changes to network addresses. Peripheral nodes require boundary function assistance from an adjacent subarea node.

**permanent virtual circuit**

See *PVC*.



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**permanent virtual connection**

See *PVC*.

**permanent virtual path**

See *PVP*.

**permit processing**

See *traffic policing*.

**Personal Communications Service**

See *PCS*.

**P/F**

poll/final bit. Bit in bit-synchronous data link layer protocols that indicates the function of a frame. If the frame is a command, a 1 in this bit indicates a poll. If the frame is a response, a 1 in this bit indicates that the current frame is the last frame in the response.

**PGL**

peer group leader. In ATM, a node in a peer group that performs the functions of the LGN. Peer group leaders exchange PTSPs with peer nodes in the parent peer group to inform those nodes of the peer group's attributes and reachability and to propagate information about the parent group and the parent group's parents to the nodes in the peer group. See also *peer group* and *PTSP*.

**PGP**

Pretty Good Privacy. Public-key encryption application that allows secure file and message exchanges. There is some controversy over the development and use of this application, in part due to U.S. national security concerns.

**phase**

Location of a position on an alternating wave form.

**phase shift**

Situation in which the relative position in time between the clock and data signals of a transmission becomes unsynchronized. In systems using long cables at higher transmission speeds, slight variances in cable construction, temperature, and other factors can cause a phase shift, resulting in high error rates.

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**PHY**

1. physical sublayer. One of two sublayers of the FDDI physical layer. See also *PMD*.
2. physical layer. In ATM, the physical layer provides for the transmission of cells over a physical medium that connects two ATM devices. The PHY is comprised of two sublayers: PMD and TC. See also *PMD* and *TC*.

**physical address**

See *MAC address*.

**physical control layer**

Layer 1 in the SNA architectural model. This layer is responsible for the physical specifications for the physical links between end systems. Corresponds to the *physical layer* of the OSI model. See also *data flow control layer*, *data-link control layer*, *path control layer*, *presentation services layer*, *transaction services layer*, and *transmission control layer*.

**physical layer**

Layer 1 of the OSI reference model. The physical layer defines the electrical, mechanical, procedural, and functional specifications for activating, maintaining, and deactivating the physical link between end systems. Corresponds with the *physical control layer* in the SNA model. See also *application layer*, *data-link layer*, *network layer*, *PQ*, *session layer*, and *transport layer*.

**physical layer convergence procedure**

See *PLCP*.

**physical layer interface module**

See *PLIM* in the “Cisco Systems Terms and Acronyms” section.

**physical media**

See *media*.

**physical medium**

See *media*.

**physical medium dependent**

See *PMD*.

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**physical sublayer**

See *PHY*.

**physical unit**

See *PU*.

**Physical Unit 2**

See *PU 2*.

**Physical Unit 2.1**

See *PU 2.1*.

**Physical Unit 4**

See *PU 4*.

**Physical Unit 5**

See *PU 5*.

**Physics Network**

See *PHYSNET*.

**PHYSNET**

Physics Network. Group of many DECnet-based physics research networks, including HEPnet. See also *HEPnet*.

**piggybacking**

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

**PIM**

Protocol Independent Multicast. Multicast routing architecture that allows the addition of IP multicast routing on existing IP networks. PIM is unicast routing protocol independent and can be operated in two modes: dense and sparse. See also *PIM dense mode* and *PIM sparse mode*.

**PIM dense mode**

One of the two PIM operational modes. PIM dense mode is data-driven and resembles typical multicast routing protocols. Packets are forwarded on all outgoing interfaces until pruning and truncation occurs. In dense mode, receivers are densely populated, and

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it is assumed that the downstream networks want to receive and will probably use the datagrams that are forwarded to them. The cost of using dense mode is its default flooding behavior. Sometimes called dense mode PIM or PIM DM. Contrast with *PIM sparse mode*. See also *PIM*.

**PIM DM**

See *PIM dense mode*.

**PIM SM**

See *PIM sparse mode*.

**PIM sparse mode**

One of the two PIM operational modes. PIM sparse mode tries to constrain data distribution so that a minimal number of routers in the network receive it. Packets are sent only if they are explicitly requested at the RP (rendezvous point). In sparse mode, receivers are widely distributed, and the assumption is that downstream networks will not necessarily use the datagrams that are sent to them. The cost of using sparse mode is its reliance on the periodic refreshing of explicit join messages and its need for RPs. Sometimes called sparse mode PIM or PIM SM. Contrast with *PIM dense mode*. See also *PIM* and *rendezvous point*.

**ping**

packet internet groper. ICMP echo message and its reply. Often used in IP networks to test the reachability of a network device.

**ping-ponging**

Phrase used to describe the actions of a packet in a two-node routing loop.

**PINX**

private integrated services network exchange. A PBX or key system which, in a BRI voice application, uses QSIG signaling.

**PKI**

public key infrastructure.

**plain old telephone service**

See *POTS*.

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**PLAR**

private line, automatic ringdown. Leased voice circuit that connects two single endpoints together. When either telephone handset is taken off-hook, the remote telephone automatically rings.

**PLCP**

physical layer convergence procedure. Specification that maps ATM cells into physical media, such as T3 or E3, and defines certain management information.

**plesiochronous transmission**

Term describing digital signals that are sourced from different clocks of comparable accuracy and stability. Compare with *asynchronous transmission*, *isochronous transmission*, and *synchronous transmission*.

**PLIM**

See *PLIM* (physical layer interface module) in the “Cisco Systems Terms and Acronyms” section.

**PLP**

packet level protocol. Network layer protocol in the X.25 protocol stack. Sometimes called X.25 Level 3 and X.25 Protocol. See also *X.25*.

**PLSP**

PNNI link state packets.

**PLU**

Primary Logical Unit. The LU that is initiating a session with another LU. See also *LU*.

**PMD**

physical medium dependent. Sublayer of the FDDI physical layer that interfaces directly with the physical medium and performs the most basic bit transmission functions of the network. See also *PHY*.

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**PNNI**

1. Private Network-Network Interface. ATM Forum specification for distributing topology information between switches and clusters of switches that is used to compute paths through the network. The specification is based on well-known link-state routing techniques and includes a mechanism for automatic configuration in networks in which the address structure reflects the topology.

2. Private Network Node Interface. ATM Forum specification for signaling to establish point-to-point and point-to-multipoint connections across an ATM network. The protocol is based on the ATM Forum UNI specification with additional mechanisms for source routing, crankback, and alternate routing of call setup requests.

**PNNI Link State Packets**

See *PLSP*.

**PNNI topology state element**

See *PTSE*.

**PNO**

Public Network Operator. See also *PTT*.

**POET**

packet over E3/T3

**point-to-multipoint connection**

One of two fundamental connection types. In ATM, a point-to-multipoint connection is a unidirectional connection in which a single source end-system (known as a root node) connects to multiple destination end-systems (known as leaves). Compare with *point-to-point connection*.

**point of presence**

See *POP*.

**point-to-point connection**

One of two fundamental connection types. In ATM, a point-to-point connection can be a unidirectional or bidirectional connection between two ATM end-systems. Compare with *point-to-multipoint connection*.

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**Point-to-Point Protocol**

See *PPP*.

**poison reverse updates**

Routing updates that explicitly indicate that a network or subnet is unreachable, rather than implying that a network is unreachable by not including it in updates. Poison reverse updates are sent to defeat large routing loops.

**POL**

Provisioning Object Library

**policy-based routing**

See *policy routing*.

**policy routing**

Routing scheme that forwards packets to specific interfaces based on user-configured policies. Such policies might specify that traffic sent from a particular network should be forwarded out one interface, while all other traffic should be forwarded out another interface.

**poll/final bit**

See *P/F*.

**polling**

Access method in which a primary network device inquires, in an orderly fashion, whether secondaries have data to transmit. The inquiry occurs in the form of a message to each secondary that gives the secondary the right to transmit.

**POM**

Provisioning Object Manager

**POP**

1. point of presence. In OSS, a physical location where an interexchange carrier installed equipment to interconnect with an *LEC* (*local exchange carrier*).
2. Post Office Protocol. Protocol that client e-mail applications use to retrieve mail from a mail server.

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**port**

1. Interface on an internetworking device (such as a router).
2. In IP terminology, an upper-layer process that receives information from lower layers. Ports are numbered, and each numbered port is associated with a specific process. For example, SMTP is associated with port 25. A port number is also called a well-known address.
3. To rewrite software or microcode so that it will run on a different hardware platform or in a different software environment than that for which it was originally designed.

**port concentrator switch**

See *PCS*.

**port snooping**

See *circuit steering*.

**POSI**

Promoting Conference for OSI. Group of executives from the six major Japanese computer manufacturers and Nippon Telephone and Telegraph that sets policies and commits resources to promote OSI.

**POST**

power-on self test. Set of hardware diagnostics that runs on a hardware device when that device is powered up.

**Post Office Protocol**

See *POP*.

**Post, Telephone, and Telegraph**

See *PTT*.

**POTS**

plain old telephone service. See *PSTN*.

**POTS dial peer**

Dial peer connected via a traditional telephony network. POTS peers point to a particular voice port on a voice network device.



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**POTS splitter**

A device (or one part of a larger device) that enables both an DSL data device (for example, a Cisco 1400 series router) and a standard analog device (such as a telephone) to share the same ADSL line.

**power-on self test**

See *POST*.

**power-on servicing**

Feature that allows faulty components to be diagnosed, removed, and replaced while the rest of the device continues to operate normally. Sometimes abbreviated POS. Sometimes called hot swapping. See also *OIR*.

**PPP**

Point-to-Point Protocol. Successor to SLIP that provides router-to-router and host-to-network connections over synchronous and asynchronous circuits. Whereas SLIP was designed to work with IP, PPP was designed to work with several network layer protocols, such as IP, IPX, and ARA. PPP also has builtin security mechanisms, such as CHAP and PAP. PPP relies on two protocols: LCP and NCP. See also *CHAP*, *LCP*, *NCP*, *PAP*, and *SLIP*.

**PQ**

priority queuing.

**presentation layer**

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

**presentation services layer**

Layer 6 of the SNA architectural model. This layer provides network resource management, session presentation services, and some application management. Corresponds roughly with the *PQ* of the OSI model. See also *data flow control layer*, *data-link control layer*, *path control layer*, *physical control layer*, *transaction services layer*, and *transmission control layer*.

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**Pretty Good Privacy**

See *PGP*.

**PRI**

Primary Rate Interface. ISDN interface to primary rate access. Primary rate access consists of a single 64-Kbps D channel plus 23 (T1) or 30 (E1) B channels for voice or data. Compare with *BRI*. See also *BISDN*, *ISDN*, and *N-ISDN*.

**primary**

See *primary station*.

**Primary LU**

See *PLU*.

**Primary Rate Interface**

See *PRI*.

**primary ring**

One of the two rings that make up an FDDI or CDDI ring. The primary ring is the default path for data transmissions. Compare with *secondary ring*.

**primary station**

In bit-synchronous data link layer protocols such as HDLC and SDLC, a station that controls the transmission activity of secondary stations and performs other management functions such as error control through polling or other means. Primary stations send commands to secondary stations and receive responses. Also called, simply, a primary. See also *secondary station*.

**print server**

Networked computer system that fields, manages, and executes (or sends for execution) print requests from other network devices.

**priority queuing**

Routing feature in which frames in an interface output queue are prioritized based on various characteristics such as packet size and interface type.

**Privacy Enhanced Mail**

See *PEM*.

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**private branch exchange**

See *PBX*.

**Private Network-Network Interface**

See *PNNI*.

**Private Network Node Interface**

See *PNNI*.

**PRMD**

Private Management Domain. X.400 Message Handling System private organization mail system (for example, NASAmail).

**process switching**

See *process switching* in the “Cisco Systems Terms and Acronyms” section.

**programmable read-only memory**

See *PROM*.

**PROM**

programmable read-only memory. ROM that can be programmed using special equipment. PROMs can be programmed only once. Compare with *EPROM*.

**propagation delay**

Time required for data to travel over a network, from its source to its ultimate destination.

**protocol**

Formal description of a set of rules and conventions that govern how devices on a network exchange information.

**protocol address**

See *network address*.

**protocol control information**

See *PCI*.

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**protocol converter**

Enables equipment with different data formats to communicate by translating the data transmission code of one device to the data transmission code of another device.

**protocol data unit**

See *PDU*.

**Protocol Independent Multicast**

See *PIM*.

**protocol stack**

Set of related communications protocols that operate together and, as a group, address communication at some or all of the seven layers of the OSI reference model. Not every protocol stack covers each layer of the model, and often a single protocol in the stack will address a number of layers at once. TCP/IP is a typical protocol stack.

**protocol translator**

Network device or software that converts one protocol into another similar protocol.

**proxy**

1. Entity that, in the interest of efficiency, essentially stands in for another entity.
2. Special gateways that relay one H.323 session to another.

**proxy Address Resolution Protocol**

See *proxy ARP*.

**proxy ARP**

proxy Address Resolution Protocol. Variation of the ARP protocol in which an intermediate device (for example, a router) sends an ARP response on behalf of an end node to the requesting host. Proxy ARP can lessen bandwidth use on slow-speed WAN links. See also *ARP*.

**proxy explorer**

Technique that minimizes exploding explorer packet traffic propagating through an SRB network by creating an explorer packet reply cache, the entries of which are reused when subsequent explorer packets need to find the same host.

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**proxy polling**

See *proxy polling* in the “Cisco Systems Terms and Acronyms” section.

**PSDN**

packet-switched data network. See *PSN*.

**PSE**

packet switch exchange. Essentially, a switch. The term PSE is generally used in reference to a switch in an X.25 packet-switch. See also *switch*.

**PSN**

packet-switched network. Network that uses packet-switching technology for data transfer. Sometimes called a PSDN. See *packet switching*.

**PSTN**

Public Switched Telephone Network. General term referring to the variety of telephone networks and services in place worldwide. Sometimes called *POTS*.

**PTI**

payload type identifier. 3-bit descriptor in the ATM cell header indicating the type of payload that the cell contains. Payload types include user and management cells; one combination indicates that the cell is the last cell of an AAL5 frame.

**PTSE**

PNNI topology state element. Collection of PNNI information that is flooded among all logical nodes within a peer group. See also *peer group* and *PNNI*.

**PTSP**

PNNI topology state packet. Type of PNNI routing packet used to exchange reachability and resource information among ATM switches to ensure that a connection request is routed to the destination along a path that has a high probability of meeting the requested QoS. Typically, PTSPs include bidirectional information about the transit behavior of particular nodes (based on entry and exit ports) and current internal state. See also *PNNI* and *QoS*.

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**PTT**

Post, Telephone, and Telegraph. Government agency that provides telephone services. PTTs exist in most areas outside North America and provide both local and long-distance telephone services.

**PU**

physical unit. SNA component that manages and monitors the resources of a node, as requested by an SSCP. There is one PU per node.

**PU 2**

Physical Unit 2. SNA peripheral node that can support only DLUs that require services from a VTAM host and that are only capable of performing the secondary LU role in SNA sessions.

**PU 2.1**

Physical Unit type 2.1. SNA network node used for connecting peer nodes in a peer-oriented network. PU 2.1 sessions do not require that one node reside on VTAM. APPN is based upon PU 2.1 nodes, which can also be connected to a traditional hierarchical SNA network.

**PU 4**

Physical Unit 4. Component of an IBM FEP capable of full-duplex data transfer. Each such SNA device employs a separate data and control path into the transmit and receive buffers of the control program.

**PU 5**

Physical Unit 5. Component of an IBM mainframe or host computer that manages an SNA network. PU 5 nodes are involved in routing within the SNA path control layer.

**public data network**

See *PDN*.

**Public Switched Telephone Network**

See *PSTN*.

**pulse amplitude modulation**

See *PAM*.

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**pulse code modulation**

See *PCM*.

**pulse density**

See *ones density*.

**PUP**

PARC Universal Protocol. Protocol similar to IP developed at PARC.

**PVC**

permanent virtual circuit or connection. Virtual circuit that is permanently established. PVCs save bandwidth associated with circuit establishment and tear down in situations where certain virtual circuits must exist all the time. In ATM terminology, called a permanent virtual connection. Compare with *SVC*. See also *virtual circuit*.

**PVP**

permanent virtual path. Virtual path that consists of PVCs. See also *PVC* and *virtual path*.

**PVP tunneling**

permanent virtual path tunneling. Method of linking two private ATM networks across a public network using a virtual path. The public network transparently trunks the entire collection of virtual channels in the virtual path between the two private networks.





## Q

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**Q.2931**

ITU-T specification, based on Q.931, for establishing, maintaining, and clearing network connections at the B-ISDN user-network interface. The UNI 3.1 specification is based on Q.2931. See also *Q.931* and *UNI*.

**Q.920/Q.921**

ITU-T specifications for the ISDN UNI data link layer. See also *UNI*.

**Q.922A**

ITU-T specification for Frame Relay encapsulation.

**Q.931**

ITU-T specification for signaling to establish, maintain, and clear ISDN network connections. See also *Q.93B*.

**Q.931**

ITU standard that describes ISDN signaling. The H.225.0 standard uses a variant of Q.931 to establish and disconnect H.323 sessions.

**Q.93B**

ITU-T specification for signaling to establish, maintain, and clear B-ISDN network connections. An evolution of ITU-T recommendation Q.931. See also *Q.931*.

**QAM**

quadrature amplitude modulation. Method of modulating digital signals onto a radio-frequency carrier signal involving both amplitude and phase coding. QAM is a modulation scheme mostly used in the downstream direction (QAM-64, QAM-256).

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QAM-16 is expected to be usable in the upstream direction. Numbers indicate number of code points per symbol. The QAM rate or the number of points in the QAM constellation can be computed by 2 raised to the power of <number of bits/symbol>.

**QLLC**

Qualified Logical Link Control. Data link layer protocol defined by IBM that allows SNA data to be transported across X.25 networks.

**QoS**

quality of service. Measure of performance for a transmission system that reflects its transmission quality and service availability.

**QoS parameters**

quality of service parameters. Parameters that control the amount of traffic the source in an ATM network sends over an SVC. If any switch along the path cannot accommodate the requested QoS parameters, the request is rejected, and a rejection message is forwarded back to the originator of the request.

**QPSK**

Quadrature Phase-Shift Keying: a method of modulating digital signals onto a radio-frequency carrier signal using four phase states to code two digital bits.

**QRSS**

quasi-random signal sequence: a test pattern widely used to simulate voice signals.

**QSIG**

Q (point of the ISDN model) Signaling. Signaling standard. Common channel signaling protocol based on ISDN Q.931 standards and used by many digital PBXs.

**Qualified Logical Link Control**

See *QLLC*.

**quality of service**

See *QoS*.

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**quartet signaling**

Signaling technique used in 100VG-AnyLAN networks that allows data transmission at 100 Mbps over four pairs of UTP cable at the same frequencies used in 10BaseT networks. See also *100VG-AnyLAN*.

**query**

Message used to inquire about the value of some variable or set of variables.

**queue**

1. Generally, an ordered list of elements waiting to be processed.
2. In routing, a backlog of packets waiting to be forwarded over a router interface.

**queuing delay**

Amount of time that data must wait before it can be transmitted onto a statistically multiplexed physical circuit.

**queuing theory**

Scientific principles governing the formation or lack of formation of congestion on a network or at an interface.

**QUIPU**

Pioneering software package developed to study the OSI Directory and provide extensive pilot capabilities.

**QWP**

query with permission.



# R

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**RACE**

Research on Advanced Communications in Europe. Project sponsored by the EC for the development of broadband networking capabilities.

**race condition ranging**

The process of acquiring the correct timing offset such that the transmissions of a cable modem are aligned with the correct mini-slot boundary.

**radio frequency**

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

**radio frequency interference**

See *RFI*.

**RAS**

registration, admission, and status protocol. Protocol used in the H.323 protocol suite for discovering and interacting with a Gatekeeper.

**RDI**

remote defect identification. In ATM, when the physical layer detects loss of signal or cell synchronization, RDI cells are used to report a VPC/VCC failure. RDI cells are sent upstream by a VPC/VCC endpoint to notify the source VPC/VCC endpoint of the downstream failure.

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**RADIUS**

Remote Dial-In User Service. Database for authenticating modem and ISDN connections and for tracking connection time.

**RAM**

random-access memory. Volatile memory that can be read and written by a microprocessor.

**random-access memory**

See *RAM*.

**Rapid Transport Protocol**

See *RTP*.

**RARE**

Réseaux Associés pour la Recherche Européenne. Association of European universities and research centers designed to promote an advanced telecommunications infrastructure in the European scientific community. RARE merged with EARN to form TERENA. See also *EARN* and *TERENA*.

**RARP**

Reverse Address Resolution Protocol. Protocol in the TCP/IP stack that provides a method for finding IP addresses based on MAC addresses. Compare with *ARP*.

**rate enforcement**

See *traffic policing*.

**rate queue**

In ATM, a value associated with one or more virtual circuits that defines the speed at which an individual virtual circuit transmits data to the remote end. Each rate queue represents a portion of the overall bandwidth available on an ATM link. The combined bandwidth of all configured rate queues should not exceed the total available bandwidth.

**RBHC**

regional Bell holding company. One of seven regional telephone companies formed by the breakup of AT&T. RBHCs differ from RBOCs in that RBHCs cross state boundaries.

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**RBOC**

regional Bell operating company. Seven regional telephone companies formed by the breakup of AT&T. RBOCs differ from RBHCs in that RBOCs do not cross state boundaries.

**rcp**

remote copy protocol. Protocol that allows users to copy files to and from a file system residing on a remote host or server on the network. The rcp protocol uses TCP to ensure the reliable delivery of data.

**rcp server**

Router or other device that acts as a server for rcp. See also *rcp*.

**RD**

Request Disconnect

**read-only memory**

See *ROM*.

**Real Time Streaming Protocol**

See *RTSP*.

**Real-time Transport Protocol**

See *RTP*.

**reassembly**

The putting back together of an IP datagram at the destination after it has been fragmented either at the source or at an intermediate node. See also *fragmentation*.

**Redialer**

Interface hardware device that interconnects between a fax device and a Public Switched Telephone Network (PSTN) network. A redialer is used to forward a dialed number to another destination. Redialers contain a database of referral telephone numbers. When the user dials a specific number, the redialer collects the dialed digits and matches them to a listing in its database. If there is a match, the redialer dials the referral number (transparent to the user) and forwards the call to the referral number.

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**redirect**

Part of the ICMP and ES-IS protocols that allows a router to tell a host that using another router would be more effective.

**redirector**

Software that intercepts requests for resources within a computer and analyzes them for remote access requirements. If remote access is required to satisfy the request, the redirector forms an RPC and sends the RPC to lower-layer protocol software for transmission through the network to the node that can satisfy the request.

**redistribution**

Allowing routing information discovered through one routing protocol to be distributed in the update messages of another routing protocol. Sometimes called route redistribution.

**redundancy**

1. In internetworking, the duplication of devices, services, or connections so that, in the event of a failure, the redundant devices, services, or connections can perform the work of those that failed. See also *redundant system*.

2. In telephony, the portion of the total information contained in a message that can be eliminated without loss of essential information or meaning.

**redundant system**

Computer, router, switch, or other system that contains two or more of each of the most important subsystems, such as two disk drives, two CPUs, or two power supplies.

**regional Bell holding company**

See *RBHC*.

**regional Bell operating company**

See *RBOC*.

**Registration, Admission, and Status (RAS) protocol**

This is the protocol used between endpoints and the gatekeeper.

**registered jack connector**

See *RJ connector*.



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**relay**

OSI terminology for a device that connects two or more networks or network systems. A data link layer (Layer 2) relay is a bridge; a network layer (Layer 3) relay is a router. See also *bridge* and *router*.

**relative rate**

See *RR*.

**Reliable SAP Update Protocol**

See *RSUP* in the “Cisco Systems Terms and Acronyms” section.

**reliability**

Ratio of expected to received keepalives from a link. If the ratio is high, the line is reliable. Used as a routing metric.

**reload**

The event of a Cisco router rebooting, or the command that causes the router to reboot.

**remote bridge**

Bridge that connects physically disparate network segments via WAN links.

**remote copy protocol**

See *rcp*.

**remote defect identification**

See *RDI*.

**remote job entry**

See *RJE*.

**remote login**

See *rlogin*.

**Remote Monitoring**

See *RMON*.

**Remote Operations Service Element**

See *ROSE*.

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**remote-procedure call**

See *RPC*.

**remote shell protocol**

See *rsh*.

**remote source-route bridging**

See *RSRB*.

**rendezvous point**

Router specified in PIM sparse mode implementations to track membership in multicast groups and to forward messages to known multicast group addresses. See also *PIM sparse mode*.

**repeater**

Device that regenerates and propagates electrical signals between two network segments. See also *segment*.

**replication**

Process of keeping a copy of data, either through shadowing or caching. See *caching* and *shadowing*.

**Request For Comments**

See *RFC*.

**Request To Send**

See *RTS*.

**request/response unit**

See *RU*.

**required visual inspection**

See *RVI*.

**Research on Advanced Communications in Europe**

See *RACE*.

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**Réseaux Associés pour la Recherche Européenne**

See *RARE*.

**Resource Reservation Protocol**

See *RSVP*.

**Reverse Address Resolution Protocol**

See *RARP*.

**Reverse Path Forwarding**

See *RPF*.

**RF**

radio frequency. Generic term referring to frequencies that correspond to radio transmissions. Cable TV and broadband networks use RF technology.

**RFC**

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

**RFI**

radio frequency interference. Radio frequencies that create noise that interferes with information being transmitted across unshielded copper cable.

**RFS**

Remote File System. Distributed file system, similar to NFS, developed by AT&T and distributed with their UNIX System V operating system.

**RFP**

request for proposal.

**RHC**

regional holding company.

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**RIF**

Routing Information Field. Field in the IEEE 802.5 header that is used by a source-route bridge to determine through which Token Ring network segments a packet must transit. A RIF is made up of ring and bridge numbers as well as other information.

**RII**

Routing Information Identifier. Bit used by SRT bridges to distinguish between frames that should be transparently bridged and frames that should be passed to the SRB module for handling.

**RIM**

Request Initialization Mode

**ring**

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

**ring group**

Collection of Token Ring interfaces on one or more routers that is part of a one-bridge Token Ring network.

**ring latency**

Time required for a signal to propagate once around a ring in a Token Ring or IEEE 802.5 network.

**ring monitor**

Centralized management tool for Token Ring networks based on the IEEE 802.5 specification. See also *active monitor* and *standby monitor*.

**ring topology**

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

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**RIP**

Routing Information Protocol. IGP supplied with UNIX BSD systems. The most common IGP in the Internet. RIP uses hop count as a routing metric. See also *hop count*, *IGP*, and *OSPF*. See also *Enhanced IGRP* and *IGRP* (Interior Gateway Routing Protocol) in the “Cisco Systems Terms and Acronyms” section.

**RIPE**

Réseaux IP Européennes. Group formed to coordinate and promote TCP/IP-based networks in Europe.

**RISC**

reduced instruction set computing

**RJ connector**

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

**RJE**

remote job entry. Application that is batch-oriented, as opposed to interactive. In RJE environments, jobs are submitted to a computing facility, and output is received later.

**rlogin**

remote login. Terminal emulation program, similar to Telnet, offered in most UNIX implementations.

**RLM**

Redundant Link Manager.

**RM**

resource management. Management of critical resources in an ATM network. Two critical resources are buffer space and trunk bandwidth. Provisioning can be used to allocate network resources in order to separate traffic flows according to service characteristics.

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**RMON**

remote monitoring. MIB agent specification described in RFC 1271 that defines functions for the remote monitoring of networked devices. The RMON specification provides numerous monitoring, problem detection, and reporting capabilities.

**ROLC**

routing over large clouds. Working group in IETF created to analyze and propose solutions to problems that arise when performing IP routing over large, shared media networks such as ATM, Frame Relay, SMDS, and X.25.

**ROM**

read-only memory. Nonvolatile memory that can be read, but not written, by the microprocessor.

**root account**

Privileged account on UNIX systems used exclusively by network or system administrators.

**root bridge**

Exchanges topology information with designated bridges in a spanning-tree implementation in order to notify all other bridges in the network when topology changes are required. This prevents loops and provides a measure of defense against link failure.

**ROSE**

Remote Operations Service Element. OSI RPC mechanism used by various OSI network application protocols.

**round-trip time**

See *RTT*.

**route**

Path through an internetwork.

**Route Processor**

See *RP* in the “Cisco Systems Terms and Acronyms” section.

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**routed protocol**

Protocol that can be routed by a router. A router must be able to interpret the logical internetwork as specified by that routed protocol. Examples of routed protocols include AppleTalk, DECnet, and IP.

**route extension**

In SNA, a path from the destination subarea node through peripheral equipment to a NAU.

**route map**

Method of controlling the redistribution of routes between routing domains.

**route summarization**

Consolidation of advertised addresses in OSPF and IS-IS. In OSPF, this causes a single summary route to be advertised to other areas by an area border router.

**router**

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

**route redistribution**

See *redistribution*.

**Route/Switch Processor**

See *RSP* in the “Cisco Systems Terms and Acronyms” section.

**routing**

Process of finding a path to a destination host. Routing is very complex in large networks because of the many potential intermediate destinations a packet might traverse before reaching its destination host.

**routing domain**

Group of end systems and intermediate systems operating under the same set of administrative rules. Within each routing domain is one or more areas, each uniquely identified by an area address.

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**Routing Information Field**

See *RIF*.

**Routing Information Identifier**

See *RII*.

**Routing Information Protocol**

See *RIP*.

**routing metric**

Method by which a routing algorithm determines that one route is better than another. This information is stored in routing tables. Metrics include bandwidth, communication cost, delay, hop count, load, MTU, path cost, and reliability. Sometimes referred to simply as a *metric*. See also *cost*.

**routing over large clouds**

See *ROLC*.

**routing protocol**

Protocol that accomplishes routing through the implementation of a specific routing algorithm. Examples of routing protocols include IGRP, OSPF, and RIP.

**routing table**

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

**Routing Table Maintenance Protocol**

See *RTMP*.

**Routing Table Protocol**

See *RTP*.

**routing update**

Message sent from a router to indicate network reachability and associated cost information. Routing updates are typically sent at regular intervals and after a change in network topology. Compare with *flash update*.



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**RP**

See *RP* (Route Processor) in the “Cisco Systems Terms and Acronyms” section.

**RPC**

remote-procedure call. Technological foundation of client-server computing. RPCs are procedure calls that are built or specified by clients and executed on servers, with the results returned over the network to the clients. See also *client/server computing*.

**RPF**

Reverse Path Forwarding. Multicasting technique in which a multicast datagram is forwarded out of all but the receiving interface if the receiving interface is the one used to forward unicast datagrams to the source of the multicast datagram.

**RR**

relative rate. In ATM, one of the congestion feedback modes provided by ABR service. In RR mode, switches set a bit in forward and backward RM cells to indicate congestion. See also *ABR* and *RLM*.

**RS-232**

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

**RS-422**

Balanced electrical implementation of EIA/TIA-449 for high-speed data transmission. Now referred to collectively with RS-423 as EIA-530. See also *EIA-530* and *RS-423*.

**RS-423**

Unbalanced electrical implementation of EIA/TIA-449 for EIA/TIA-232 compatibility. Now referred to collectively with RS-422 as EIA-530. See also *EIA-530* and *RS-422*.

**RS-449**

Popular physical layer interface. Now known as *EIA/TIA-449*. See *EIA/TIA-449*.

**RSA**

Acronym stands for Rivest, Shamir, and Adelman, the inventors of the technique. Public-key cryptographic system which may be used for encryption and authentication.

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**rsh**

remote shell protocol. Protocol that allows a user to execute commands on a remote system without having to log in to the system. For example, rsh can be used to remotely examine the status of a number of access servers without connecting to each communication server, executing the command, and then disconnecting from the communication server.

**RSM**

Route Switch Module

**RSP**

See *RSP* (Route/Switch Processor) in the “Cisco Systems Terms and Acronyms” section.

**RSRB**

remote source-route bridging. SRB over WAN links. See also *SRB*.

**RSUP**

See *RSUP* (Reliable SAP Update Protocol) in the “Cisco Systems Terms and Acronyms” section.

**RSVP**

Resource Reservation Protocol. Protocol that supports the reservation of resources across an IP network. Applications running on IP end systems can use RSVP to indicate to other nodes the nature (bandwidth, jitter, maximum burst, and so forth) of the packet streams they want to receive. RSVP depends on IPv6. Also known as Resource Reservation Setup Protocol. See also *IPv6*.

**RTCP**

RTP Control Protocol. Protocol that monitors the QOS of an IPv6 RTP connection and conveys information about the on-going session. See also *RTP* (*Real-Time Transport Protocol*).

**RTFM**

read the fantastic manual. Acronym often used when someone asks a simple or common question.

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**RTMP**

Routing Table Maintenance Protocol. Apple Computer's proprietary routing protocol. RTMP establishes and maintains the routing information that is required to route datagrams from any source socket to any destination socket in an AppleTalk network. Using RTMP, routers dynamically maintain routing tables to reflect changes in topology. RTMP was derived from RIP. See also *RIP (Routing Table Protocol)*.

**RTP**

1. Routing Table Protocol. VINES routing protocol based on RIP. Distributes network topology information and aids VINES servers in finding neighboring clients, servers, and routers. Uses delay as a routing metric. See also *SRTP*.

2. Rapid Transport Protocol. Provides pacing and error recovery for APPN data as it crosses the APPN network. With RTP, error recovery and flow control are done end-to-end rather than at every node. RTP prevents congestion rather than reacts to it.

3. Real-Time Transport Protocol. One of the IPv6 protocols. RTP is designed to provide end-to-end network transport functions for applications transmitting real-time data, such as audio, video, or simulation data, over multicast or unicast network services. RTP provides services such as payload type identification, sequence numbering, timestamping, and delivery monitoring to real-time applications.

**RTP Control Protocol**

See *RTCP*.

**RTS**

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

**RTSC**

read the source code.

**RTSP**

Real Time Streaming Protocol. Enables the controlled delivery of real-time data, such as audio and video. Sources of data can include both live data feeds, such live audio and video, and stored content, such as pre-recorded events. RTSP is designed to work with established protocols, such as RTP and HTTP.

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**RTT**

round-trip time. Time required for a network communication to travel from the source to the destination and back. RTT includes the time required for the destination to process the message from the source and generate a reply. RTT is used by some routing algorithms to aid in calculating optimal routes.

**RU**

request/response unit. Request and response messages exchanged between NAUs in an SNA network.

**RUDP**

Reliable User Data Protocol

**run-time memory**

Memory accessed while a program runs.

**RVI**

required visual inspection.

# S

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**SAC**

single-attached concentrator. FDDI or CDDI concentrator that connects to the network by being cascaded from the master port of another FDDI or CDDI concentrator.

**sampling rate**

Rate at which samples of a particular waveform amplitude are taken.

**SAP**

1. service access point. Field defined by the IEEE 802.2 specification that is part of an address specification. Thus, the destination plus the DSAP define the recipient of a packet. The same applies to the SSAP. See also *DSAP* and *SSAP*.

2. Service Advertising Protocol. IPX protocol that provides a means of informing network clients, via routers and servers, of available network resources and services. See also *IPX*.

**SAR**

segmentation and reassembly. One of the two sublayers of the AAL CPCS, responsible for dividing (at the source) and reassembling (at the destination) the PDUs passed from the CS. The SAR sublayer takes the PDUs processed by the CS and, after dividing them into 48-byte pieces of payload data, passes them to the ATM layer for further processing. See also *AAL*, *ATM layer*, *CPCS*, *CS*, and *SSCS*.

**SAS**

1. single attachment station. Device attached only to the primary ring of an FDDI ring. Also known as a Class B station. Compare with *DAS*. See also *FDDI*.

---

2. statically assigned socket. Socket that is permanently reserved for use by a designated process. In an AppleTalk network, SASs are numbered 1 to 127; they are reserved for use by specific socket clients and for low-level built-in network services.

**satellite communication**

Use of orbiting satellites to relay data between multiple earth-based stations. Satellite communications offer high bandwidth and a cost that is not related to distance between earth stations, long propagation delays, or broadcast capability.

**SBus**

Bus technology used in Sun SPARC-based workstations and servers. The SBus specification was adopted by the IEEE as a new bus standard.

**SCCP**

Signaling Connection Control Part. Trillium software that supports routing and translation and management functions and data transfer without logical signaling connections.

**SCP**

Service Control Point. An element of an SS7-based Intelligent Network which performs various service functions, such as number translation, call setup and teardown, etc.

**SCR**

sustainable cell rate. Parameter defined by the ATM Forum for ATM traffic management. For VBR connections, SCR determines the long-term average cell rate that can be transmitted. See also *VBR*.

**SCTE**

serial clock transmit external. Timing signal that DTE echoes to DCE to maintain clocking. SCTE is designed to compensate for clock phase shift on long cables. When the DCE device uses SCTE instead of its internal clock to sample data from the DTE, it is better able to sample the data without error even if there is a phase shift in the cable. See also *phase shift*.

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**SDH**

Synchronous Digital Hierarchy. European standard that defines a set of rate and format standards that are transmitted using optical signals over fiber. SDH is similar to SONET, with a basic SDH rate of 155.52 Mbps, designated as STM-1. See also *SONET* and *STM-1*.

**SDLC**

Synchronous Data Link Control. SNA data link layer communications protocol. SDLC is a bit-oriented, full-duplex serial protocol that has spawned numerous similar protocols, including HDLC and LAPB. See also *HDLC* and *LAPB*.

**SDLC broadcast**

See *SDLC broadcast* in the “Cisco Systems Terms and Acronyms” section.

**SDLC Transport**

See *SDLC Transport* in the “Cisco Systems Terms and Acronyms” section.

**SDLLC**

See *SDLLC* in the “Cisco Systems Terms and Acronyms” section.

**SDSL**

single-line digital subscriber line. One of four DSL technologies. SDSL delivers 1.544 Mbps both downstream and upstream over a single copper twisted pair. The use of a single twisted pair limits the operating range of SDSL to 10,000 feet (3048.8 meters). Compare with *ADSL*, *HDSL*, and *VDSL*.

**SDSU**

SMDS DSU. DSU for access to SMDS via HSSIs and other serial interfaces.

**SDU**

service data unit. Unit of information from an upper-layer protocol that defines a service request to a lower-layer protocol.

**SEAL**

simple and efficient AAL. Scheme used by AAL5 in which the SAR sublayer segments CS PDUs without adding additional fields. See also *AAL*, *AAL5*, *CS*, and *SAR*.

---

**secondary**

See *secondary station*.

**secondary ring**

One of the two rings making up an FDDI or CDDI ring. The secondary ring is usually reserved for use in the event of a failure of the primary ring. Compare with *primary ring*.

**secondary station**

In bit-synchronous data link layer protocols such as HDLC, a station that responds to commands from a primary station. Sometimes referred to simply as a *secondary*. See also *primary station*.

**Section DCC**

Section Data Communications Channel. In OSS, a 192-kbps data communications channel embedded in the section overhead for OAM&P traffic between two SONET network elements. See also *OAM&P* and *SONET*.

**security management**

One of five categories of network management defined by ISO for management of OSI networks. Security management subsystems are responsible for controlling access to network resources. See also *accounting management*, *configuration management*, *fault management*, and *performance management*.

**seed router**

Router in an AppleTalk network that has the network number or cable range built in to its port descriptor. The seed router defines the network number or cable range for other routers in that network segment and responds to configuration queries from nonseed routers on its connected AppleTalk network, allowing those routers to confirm or modify their configurations accordingly. Each AppleTalk network must have at least one seed router. See also *nonseed router*.

**segment**

1. Section of a network that is bounded by bridges, routers, or switches.
2. In a LAN using a bus topology, a segment is a continuous electrical circuit that is often connected to other such segments with repeaters.



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3. Term used in the TCP specification to describe a single transport layer unit of information. The terms *datagram*, *frame*, *message*, and *packet* are also used to describe logical information groupings at various layers of the OSI reference model and in various technology circles.

**segmentation and reassembly**

See *SAR*.

**selector**

Identifier (octet string) used by an OSI entity to distinguish among multiple SAPs at which it provides services to the layer above.

**sequence number protection**

See *SNP*.

**Sequenced Packet Exchange**

See *SPX*.

**Sequenced Packet Protocol**

See *SPP*.

**Sequenced Routing Update Protocol**

See *SRTP*.

**serial clock transmit external**

See *SCTE*.

**Serial Line Internet Protocol**

See *SLIP*.

**serial transmission**

Method of data transmission in which the bits of a data character are transmitted sequentially over a single channel. Compare with *parallel transmission*.

**serial tunnel**

See *STUN* in the “Cisco Systems Terms and Acronyms” section.

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**server**

Node or software program that provides services to clients. See also *back end*, *client*, and *FRF.11*.

**Server Message Block**

See *SMB*.

**service access point**

See *SAP*.

**Service Advertising Protocol**

See *SAP*.

**service data unit**

See *SDU*.

**service point**

Interface between non-SNA devices and NetView that sends alerts from equipment unknown to the SNA environment.

**service profile identifier**

See *SPID*.

**Service Specific Connection Oriented Protocol**

See *SSCOP*.

**service specific convergence sublayer**

See *SSCS*.

**session**

1. Related set of communications transactions between two or more network devices.
2. In SNA, a logical connection enabling two NAUs to communicate.

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**session layer**

Layer 5 of the OSI reference model. This layer establishes, manages, and terminates sessions between applications and manages data exchange between presentation layer entities. Corresponds to the *data flow control layer* of the SNA model. See also *application layer*, *data-link layer*, *network layer*, *physical layer*, *PQ*, and *transport layer*.

**SET**

Secure Electronic Transactions. SET specification developed to allow for secure credit card and off-line debit card (check card) transactions over the World-Wide Web.

**SF**

Super Frame. Common framing type used on T1 circuits. SF consists of 12 frames of 192 bits each, with the 193rd bit providing error checking and other functions. SF is superseded by ESF, but is still widely used. Also called D4 framing. See also *ESF*.

**S-frame**

Supervisory frame. One of three SDLC frame formats. See also *I-frame* and *U-frame*.

**SGCP**

Simple Gateway Control Protocol. Controls Voice over IP gateways by an external call control element (called a call-agent). This has been adapted to allow SGCP to control switch ATM Circuit Emulation Service circuits (called endpoints in SGCP). The resulting system (call-agents and gateways) allows for the call-agent to engage in Common Channel Signalling (CCS) over a 64-Kbps CES circuit, governing the interconnection of bearer channels on the CES interface.

**SGML**

Standardized Generalized Markup Language. International standard for the definition of system-independent, device-independent methods of representing text in electronic form.

**SGMP**

Simple Gateway Monitoring Protocol. Network management protocol that was considered for Internet standardization and later evolved into SNMP. Documented in RFC 1028. See also *SNMP*.

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**shadowing**

Form of replication in which well-defined units of information are copied to several DSAs.

**shaping**

See *traffic shaping*.

**shielded cable**

Cable that has a layer of shielded insulation to reduce EMI.

**shielded twisted-pair**

See *STP*.

**shortest path first algorithm**

See *SPF*.

**shortest-path routing**

Routing that minimizes distance or path cost through application of an algorithm.

**SID**

Service ID: a number that defines (at the MAC sublayer) a particular mapping between a cable modem (CM) and the CMTS. The SID is used for the purpose of upstream bandwidth allocation and class-of-service management.

**Signal path**

Route of a signal channel that carries signaling data.

**signaling**

Process of sending a transmission signal over a physical medium for purposes of communication.

**signaling packet**

Generated by an ATM-connected device that wants to establish a connection with another such device. The signaling packet contains the ATM NSAP address of the desired ATM endpoint, as well as any QoS parameters required for the connection. If the endpoint can support the desired QoS, it responds with an accept message, and the connection is opened. See also *QoS*.

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**Signaling System 7**

See *SS7*.

**signal quality error**

See *SQE*.

**silicon switching**

See *silicon switching* in the “Cisco Systems Terms and Acronyms” section.

**silicon switching engine**

See *SSE* in the “Cisco Systems Terms and Acronyms” section.

**Silicon Switch Processor**

See *SSP* in the “Cisco Systems Terms and Acronyms” section.

**SIM**

Set Initialization Mode

**simple and efficient AAL**

See *SEAL*.

**Simple Gateway Monitoring Protocol**

See *SGMP*.

**Simple Mail Transfer Protocol**

See *SMTP*.

**Simple Multicast Routing Protocol**

See *SMRP*.

**Simple Network Management Protocol**

See *SNMP*.

**simplex**

Capability for transmission in only one direction between a sending station and a receiving station. Broadcast television is an example of a simplex technology. Compare with *full duplex* and *half duplex*.

---

**single-attached concentrator**

See *SAC*.

**single attachment station**

See *SAS*.

**single-mode fiber**

Fiber-optic cabling with a narrow core that allows light to enter only at a single angle. Such cabling has higher bandwidth than multimode fiber, but requires a light source with a narrow spectral width (for example, a laser). Also called monomode fiber. See also *multimode fiber*.

**single-route explorer packet**

See *spanning explorer packet*.

**single-vendor network**

Network using equipment from only one vendor. Single-vendor networks rarely suffer compatibility problems. See also *multivendor network*.

**SIP**

1. SMDS Interface Protocol. Used in communications between CPE and SMDS network equipment. Allows the CPE to use SMDS service for high-speed WAN internetworking. Based on the IEEE 802.6 DQDB standard. See also *DQDB*.

2. serial interface processor.

3. session initiation protocol.

**Site**

Group of closely related configuration data. It can be the name of a physical location or it can be a name you choose to give to one segment of your overall system.

**SLAC**

Stanford Linear Accelerator Center.

**SLC**

Signaling link code. Code that identifies a linkset.

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**sliding window flow control**

Method of flow control in which a receiver gives transmitter permission to transmit data until a window is full. When the window is full, the transmitter must stop transmitting until the receiver advertises a larger window. TCP, other transport protocols, and several data link layer protocols use this method of flow control.

**SLIP**

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

**slotted ring**

LAN architecture based on a ring topology in which the ring is divided into slots that circulate continuously. Slots can be either empty or full, and transmissions must start at the beginning of a slot.

**SMAC**

source MAC. MAC address specified in the Source Address field of a packet. Compare with *DMAC*. See also *MAC address*.

**SMB**

Server Message Block. File-system protocol used in LAN manager and similar NOSs to package data and exchange information with other systems.

**SMDS**

Switched Multimegabit Data Service. High-speed, packet-switched, datagram-based WAN networking technology offered by the telephone companies. See also *CBDS*.

**SMDS Interface Protocol**

See *SIP*.

**SMF**

single-mode fiber.

**SMI**

Structure of Management Information. Document (RFC 1155) specifying rules used to define managed objects in the MIB. See also *MIB*.

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**SMO**

state machine object.

**smoothing**

See *traffic shaping*.

**SMRP**

Simple Multicast Routing Protocol. Specialized multicast network protocol for routing multimedia data streams on enterprise networks. SMRP works in conjunction with multicast extensions to the AppleTalk protocol.

**SMT**

Station Management. ANSI FDDI specification that defines how ring stations are managed.

**SMTP**

Simple Mail Transfer Protocol. Internet protocol providing e-mail services.

**SNA**

Systems Network Architecture. Large, complex, feature-rich network architecture developed in the 1970s by IBM. Similar in some respects to the OSI reference model, but with a number of differences. SNA is essentially composed of seven layers. See *data flow control layer*, *data-link control layer*, *path control layer*, *physical control layer*, *presentation services layer*, *transaction services layer*, and *transmission control layer*.

**SNA Distribution Services**

See *SNADS*.

**SNA Network Interconnection**

See *SNI*.

**SNADS**

SNA Distribution Services. Consists of a set of SNA transaction programs that interconnect and cooperate to provide asynchronous distribution of information between end users. One of three SNA transaction services. See also *DDM* and *DIA*.



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**SNAP**

Subnetwork Access Protocol. Internet protocol that operates between a network entity in the subnetwork and a network entity in the end system. SNAP specifies a standard method of encapsulating IP datagrams and ARP messages on IEEE networks. The SNAP entity in the end system makes use of the services of the subnetwork and performs three key functions: data transfer, connection management, and QoS selection.

**SNI**

1. Subscriber Network Interface. Interface for SMDS-based networks that connects CPE and an SMDS switch. See also *UNI*.
2. SNA Network Interconnection. IBM gateway connecting multiple SNA networks.

**SNMP**

Simple Network Management Protocol. Network management protocol used almost exclusively in TCP/IP networks. SNMP provides a means to monitor and control network devices, and to manage configurations, statistics collection, performance, and security. See also *SGMP* and *SNMP2*.

**SNMP communities**

Authentication scheme that enables an intelligent network device to validate SNMP requests.

**SNMP2**

SNMP Version 2. Version 2 of the popular network management protocol. SNMP2 supports centralized as well as distributed network management strategies, and includes improvements in the SMI, protocol operations, management architecture, and security. See also *SNMP*.

**SNP**

sequence number protection.

**SNPA**

subnetwork point of attachment. Data link layer address (such as an Ethernet address, X.25 address, or Frame Relay DLCI address). SNPA addresses are used to configure a CLNS route for an interface.

---

**SNRM**

Set Normal Response.

**SNRME**

Set Normal Response. Mode Exchange.

**socket**

1. Software structure operating as a communications end point within a network device.
2. Addressable entity within a node connected to an AppleTalk network; sockets are owned by software processes known as socket clients. AppleTalk sockets are divided into two groups: SASs, which are reserved for clients such as AppleTalk core protocols, and DASs, which are assigned dynamically by DDP upon request from clients in the node. An AppleTalk socket is similar in concept to a TCP/IP port.

**socket client**

Software process or function implemented in an AppleTalk network node.

**socket listener**

Software provided by a socket client to receive datagrams addressed to the socket. See also *socket client*.

**socket number**

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

**SOHO**

small office, home office. Networking solutions and access technologies for offices that are not directly connected to large corporate networks.

**SONET**

Synchronous Optical Network. High-speed (up to 2.5 Gbps) synchronous network specification developed by Bellcore and designed to run on optical fiber. STS-1 is the basic building block of SONET. Approved as an international standard in 1988. See also *SDH*, *STS-1*, and *STS-3c*.

**source address**

Address of a network device that is sending data. See also *destination address*.

---

**source MAC**

See *SMAC*.

**source-route bridging**

See *SRB*.

**source-route translational bridging**

See *SR/TLB*.

**source-route transparent bridging**

See *SRT*.

**source service access point**

See *SSAP*.

**Southeastern Universities Research Association Network**

See *SURAnet*.

**SP**

1. Signaling Processor, Signaling Point.
2. See *SP* (Switch Processor) in the “Cisco Systems Terms and Acronyms” section.

**SPAG**

Standards Promotion and Application Group. Group of European OSI manufacturers that chooses option subsets and publishes these in the “Guide to the Use of Standards” (GUS).

**spam**

Term used to describe unsolicited e-mail or newsgroup posts, often in the form of commercial announcements. The act of sending a spam is called, naturally spamming.

**span**

Full-duplex digital transmission line between two digital facilities.

**SPAN**

See *SPAN* (Switched Port Analyzer) in the “Cisco Systems Terms and Acronyms” section.

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**spanning explorer packet**

Follows a statically configured spanning tree when looking for paths in an SRB network. Also known as a limited-route explorer packet or a single-route explorer packet. See also *all-routes explorer packet*, *explorer packet*, and *local explorer packet*.

**spanning tree**

Loop-free subset of a network topology. See also *spanning-tree algorithm* and *Spanning-Tree Protocol*.

**spanning-tree algorithm**

Algorithm used by the Spanning-Tree Protocol to create a spanning tree. Sometimes abbreviated as STA. See also *spanning tree* and *Spanning-Tree Protocol*.

**Spanning-Tree Protocol**

Bridge protocol that uses the spanning-tree algorithm, enabling a learning bridge to dynamically work around loops in a network topology by creating a spanning tree. Bridges exchange BPDU messages with other bridges to detect loops, and then remove the loops by shutting down selected bridge interfaces. Refers to both the IEEE 802.1 Spanning-Tree Protocol standard and the earlier Digital Equipment Corporation Spanning-Tree Protocol upon which it is based. The IEEE version supports bridge domains and allows the bridge to construct a loop-free topology across an extended LAN. The IEEE version is generally preferred over the Digital version. Sometimes abbreviated as STP. See also *BPDU*, *learning bridge*, *MAC address learning*, *spanning tree*, and *spanning-tree algorithm*.

**sparse mode PIM**

See *PIM sparse mode*.

**speed matching**

Feature that provides sufficient buffering capability in a destination device to allow a high-speed source to transmit data at its maximum rate, even if the destination device is a lower-speed device.

**SPF**

shortest path first algorithm. Routing algorithm that iterates on length of path to determine a shortest-path spanning tree. Commonly used in link-state routing algorithms. Sometimes called Dijkstra's algorithm. See also *link-state routing algorithm*.

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**SPID**

service profile identifier. Number that some service providers use to define the services to which an ISDN device subscribes. The ISDN device uses the SPID when accessing the switch that initializes the connection to a service provider.

**split-horizon updates**

Routing technique in which information about routes is prevented from exiting the router interface through which that information was received. Split-horizon updates are useful in preventing routing loops.

**SPNNI connection**

See *SPNNI connection* in the “Cisco Systems Terms and Acronyms” section.

**spoofing**

1. Scheme used by routers to cause a host to treat an interface as if it were up and supporting a session. The router spoofs replies to keepalive messages from the host in order to convince that host that the session still exists. Spoofing is useful in routing environments such as DDR, in which a circuit-switched link is taken down when there is no traffic to be sent across it in order to save toll charges. See also *DDR*.

2. The act of a packet illegally claiming to be from an address from which it was not actually sent. Spoofing is designed to foil network security mechanisms such as filters and access lists.

**spooler**

Application that manages requests or jobs submitted to it for execution. Spoolers process the submitted requests in an orderly fashion from a queue. A print spooler is a common example of a spooler.

**SPP**

Sequenced Packet Protocol. Provides reliable, connection-based, flow-controlled packet transmission on behalf of client processes. Part of the XNS protocol suite.

**SPX**

Sequenced Packet Exchange. Reliable, connection-oriented protocol that supplements the datagram service provided by network layer (Layer 3) protocols. Novell derived this commonly used NetWare transport protocol from the SPP of the XNS protocol suite.

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**SQE**

signal quality error. Transmission sent by a transceiver back to the controller to let the controller know whether the collision circuitry is functional. Also called *heartbeat*.

**SQL**

Structured Query Language. International standard language for defining and accessing relational databases.

**SRAM**

Type of RAM that retains its contents for as long as power is supplied. SRAM does not require constant refreshing, like DRAM. Compare with *DRAM*.

**SRB**

source-route bridging. Method of bridging originated by IBM and popular in Token Ring networks. In an SRB network, the entire route to a destination is predetermined, in real time, prior to the sending of data to the destination. Contrast with *transparent bridging*.

**SRP**

spatial reuse protocol

**SRT**

source-route transparent bridging. IBM bridging scheme that merges the two most prevalent bridging strategies: SRB and transparent bridging. SRT employs both technologies in one device to satisfy the needs of all ENs. No translation between bridging protocols is necessary. Compare with *SR/TLB*.

**SR/TLB**

source-route translational bridging. Method of bridging where source-route stations can communicate with transparent bridge stations with the help of an intermediate bridge that translates between the two bridge protocols. Compare with *SRT*.

**SRTP**

Sequenced Routing Update Protocol. Protocol that assists VINES servers in finding neighboring clients, servers, and routers. See also *RTP (Routing Table Protocol)*.

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**SS7**

Signaling System 7. Standard CCS system used with BISDN and ISDN. Developed by Bellcore. See also *CCS*.

**SSAP**

source service access point. SAP of the network node designated in the Source field of a packet. Compare to *DSAP*. See also *SAP (service access point)*.

**SSCP**

system services control points. Focal points within an SNA network for managing network configuration, coordinating network operator and problem determination requests, and providing directory services and other session services for network end users.

**SSCP-PU session**

Session used by SNA to allow an SSCP to manage the resources of a node through the PU. SSCPs can send requests to, and receive replies from, individual nodes in order to control the network configuration.

**SSCOP**

Service Specific Connection Oriented Protocol. Data link protocol that guarantees delivery of ATM signaling packets.

**SSCS**

service specific convergence sublayer. One of the two sublayers of any AAL. SSCS, which is service dependent, offers assured data transmission. The SSCS can be null as well, in classical IP over ATM or LAN emulation implementations. See also *AAL*, *ATM layer*, *CPCS*, *CS*, and *SAR*.

**SSE**

See *SSE* (silicon switching engine) in the “Cisco Systems Terms and Acronyms” section.

**SSL**

Secure Socket Layer. Encryption technology for the Web used to provide secure transactions such as the transmission of credit card numbers for e-commerce.

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**SSN**

Subsystem number

**SSP**

1. Switch-to-Switch Protocol. Protocol specified in the DLSw standard that routers use to establish DLSw connections, locate resources, forward data, and handle flow control and error recovery. See also *DLSw*.

2. Silicon Switch Processor. See *SSP* in the “Cisco Systems Terms and Acronyms” section.

**statically assigned socket**

See *SAS*.

**STA**

See *spanning-tree algorithm*.

**stack**

See *protocol stack*.

**standard**

Set of rules or procedures that are either widely used or officially specified. See also *de facto standard* and *de jure standard*.

**standby monitor**

Device placed in standby mode on a Token Ring network in case an active monitor fails. See also *active monitor* and *ring monitor*.

**StarLAN**

CSMA/CD LAN, based on IEEE 802.3, developed by AT&T.

**star topology**

LAN topology in which end points on a network are connected to a common central switch by point-to-point links. A ring topology that is organized as a star implements a unidirectional closed-loop star, instead of point-to-point links. Compare with *bus topology*, *ring topology*, and *tree topology*.



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**start-stop transmission**

See *asynchronous transmission*.

**startup range**

Range of values (from 65280 to 65534) from which an AppleTalk node selects the network number part of its provisional address if it has not saved another network number.

**static route**

Route that is explicitly configured and entered into the routing table. Static routes take precedence over routes chosen by dynamic routing protocols.

**Station Management**

See *SMT*.

**statistical multiplexing**

Technique whereby information from multiple logical channels can be transmitted across a single physical channel. Statistical multiplexing dynamically allocates bandwidth only to active input channels, making better use of available bandwidth and allowing more devices to be connected than with other multiplexing techniques. Also referred to as *statistical time-division multiplexing* or *stat mux*. Compare with *ATDM*, *FDM*, and *TDM*.

**statistical time-division multiplexing**

See *statistical multiplexing*.

**stat mux**

See *statistical multiplexing*.

**STD**

Subseries of RFCs that specify Internet standards. The official list of Internet standards is in STD 1.

**STM-1**

Synchronous Transport Module level 1. One of a number of SDH formats that specifies the frame structure for the 155.52-Mbps lines used to carry ATM cells. See also *SDH*.

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**store and forward**

Function whereby a message is transmitted to some intermediate relay point and temporarily stored before forwarding to the next relay point.

**store and forward packet switching**

Packet-switching technique in which frames are completely processed before being forwarded out the appropriate port. This processing includes calculating the CRC and checking the destination address. In addition, frames must be temporarily stored until network resources (such as an unused link) are available to forward the message. Contrast with *cut-through packet switching*.

**STP**

1. shielded twisted-pair. Two-pair wiring medium used in a variety of network implementations. STP cabling has a layer of shielded insulation to reduce EMI. Compare with *UTP*. See also *twisted pair*.

2. See *Spanning-Tree Protocol*.

**stream-oriented**

Type of transport service that allows its client to send data in a continuous stream. The transport service will guarantee that all data will be delivered to the other end in the same order as sent and without duplicates.

**Structure of Management Information**

See *SMI*.

**STS-1**

Synchronous Transport Signal level 1. Basic building block signal of SONET, operating at 51.84 Mbps. Faster SONET rates are defined as *STS-n*, where *n* is a multiple of 51.84 Mbps. See also *SONET*.

**STS-3c**

Synchronous Transport Signal level 3, concatenated. SONET format that specifies the frame structure for the 155.52-Mbps lines used to carry ATM cells. See also *SONET*.

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**stub area**

OSPF area that carries a default route, intra-area routes, and interarea routes, but does not carry external routes. Virtual links cannot be configured across a stub area, and they cannot contain an ASBR. Compare with *non-stub area*. See also *ASAM* and *OSPF*.

**stub network**

Network that has only a single connection to a router.

**subarea**

Portion of an SNA network that consists of a subarea node and any attached links and peripheral nodes.

**subarea node**

SNA communication controller or host that handles complete network addresses.

**STUN**

See *STUN* (serial tunnel) in the “Cisco Systems Terms and Acronyms” section.

**SU**

1. signaling unit. Another name for the TransPath product.
2. service unit or signaling unit.

**subchannel**

In broadband terminology, a frequency-based subdivision creating a separate communications channel.

**subinterface**

One of a number of virtual interfaces on a single physical interface.

**subnet**

See *subnetwork*.

**subnet address**

Portion of an IP address that is specified as the subnetwork by the subnet mask. See also *IP address*, *subnet mask*, and *subnetwork*.

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**subnet mask**

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

**subnetwork**

1. In IP networks, a network sharing a particular subnet address. Subnetworks are networks arbitrarily segmented by a network administrator in order to provide a multilevel, hierarchical routing structure while shielding the subnetwork from the addressing complexity of attached networks. Sometimes called a subnet. See also *IP address*, *subnet address*, and *subnet mask*.

2. In OSI networks, a collection of ESs and ISs under the control of a single administrative domain and using a single network access protocol.

**Subnetwork Access Protocol**

See *SNAP*.

**subnetwork point of attachment**

See *SNPA*.

**Subscriber Network Interface**

See *SNI*.

**subvector**

Data segment of a vector in an SNA message. A subvector consists of a length field, a key that describes the subvector type, and subvector specific data.

**Super Frame**

See *SF*.

**Super-JANET**

Latest phase in the development of JANET, the UK educational and research network run by UKERNA. It uses SMDS and ATM to provide multiservice network facilities for many new applications including multimedia conferencing.

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**supernet**

Aggregation of IP network addresses advertised as a single classless network address. For example, given four Class C IP networks—192.0.8.0, 192.0.9.0, 192.0.10.0 and 192.0.11.0—each having the intrinsic network mask of 255.255.255.0, one can advertise the address 192.0.8.0 with a subnet mask of 255.255.252.0.

**supervisory processor**

See *RP* in the “Cisco Systems Terms and Acronyms” section.

**SURAnet**

Southeastern Universities Research Association Network. Network connecting universities and other organizations in the Southeastern United States. SURAnet, originally funded by the NSF and a part of the NSFNET, is now part of BBN Planet. See also *BBN Planet*, *NSF*, and *NSFNET*.

**sustainable cell rate**

See *SCP*.

**SVC**

switched virtual circuit. Virtual circuit that is dynamically established on demand and is torn down when transmission is complete. SVCs are used in situations where data transmission is sporadic. Called a switched virtual connection in ATM terminology. Compare with *PVC*.

**switch**

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

**switched calls**

Normal telephone calls in which a user picks up a phone, hears dial tone, enters the destination phone number to reach the other phone. Switched calls can also be private line auto-ringdown (*PLAR*) calls, or tie-line calls for fixed point-to-point connections. See also *PLAR*.

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**switched LAN**

LAN implemented with LAN switches. See *LAN switch*.

**Switched Multimegabit Data Service**

See *SMDS*.

**Switched Port Analyzer**

See *span*.

**switched virtual circuit**

See *SVC*.

**switched virtual connection**

See *SVC*.

**Switch Processor**

See *Switch Processor* in the “Cisco Systems Terms and Acronyms” section.

**Switch-to-Switch Protocol**

See *SSP*.

**synchronization**

Establishment of common timing between sender and receiver.

**Synchronous Data Link Control**

See *SDLC*.

**Synchronous Digital Hierarchy**

See *SDH*.

**Synchronous Optical Network**

See *SONET*.

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**synchronous transmission**

Term describing digital signals that are transmitted with precise clocking. Such signals have the same frequency, with individual characters encapsulated in control bits (called start bits and stop bits) that designate the beginning and end of each character. Compare with *asynchronous transmission*, *isochronous transmission*, and *plesiochronous transmission*.

**Synchronous Transport Module level 1**

See *STM-1*.

**Synchronous Transport Signal level 1**

See *STS-1*.

**Synchronous Transport Signal level 3, concatenated**

See *STS-3c*.

**sysgen**

system generation. Process of defining network resources in a network.

**system generation**

See *sysgen*.

**system services control points**

See *SSCP*.

**Systems Network Architecture**

See *SNA*.





# T

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**T1**

Digital WAN carrier facility. T1 transmits DS-1-formatted data at 1.544 Mbps through the telephone-switching network, using AMI or B8ZS coding. Compare with *E1*. See also *AMI*, *B8ZS*, and *DS-1*.

**T.120**

ITU standard that describes data conferencing. H.323 provides for the ability to establish T.120 data sessions inside of an existing H.323 session.

**T3**

Digital WAN carrier facility. T3 transmits DS-3-formatted data at 44.736 Mbps through the telephone switching network. Compare with *E3*. See also *DS-3*.

**TABS**

Telemetry Asynchronous Block Serial. AT&T polled point-to-point or multipoint communication protocol that supports moderate data transfer rates over intra-office wire pairs.

**TAC**

1. Terminal Access Controller. Internet host that accepts terminal connections from dial-up lines.
2. Cisco Technical Assistance Center. See *TAC* and *TACACS+* in the *Cisco Systems Terms and Acronyms* section.

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**TACACS**

Terminal Access Controller Access Control System. Authentication protocol, developed by the DDN community, that provides remote access authentication and related services, such as event logging. User passwords are administered in a central database rather than in individual routers, providing an easily scalable network security solution. See also *TACACS+* in the “Cisco Systems Terms and Acronyms” section.

**TACACS+**

See *TACACS+* (Terminal Access Controller Access Control System Plus) in the “Cisco Systems Terms and Acronyms” section.

**tag**

Identification information, including a number plus other information.

**tag switching**

High-performance, packet-forwarding technology that integrates network layer (Layer 3) routing and data link layer (Layer 2) switching and provides scalable, high-speed switching in the network core. Tag switching is based on the concept of label swapping, in which packets or cells are assigned short, fixed-length labels that tell switching nodes how data should be forwarded.

**tagged traffic**

ATM cells that have their CLP bit set to 1. If the network is congested, tagged traffic can be dropped to ensure delivery of higher-priority traffic. Sometimes called DE traffic. See also *CLP*.

**Tandem switching**

Dynamic switching of voice calls between VoFR, VoATM, or VoHDLc PVCs and subchannels; also called tandeming. Tandem switching is often encountered in multi-hop VoFR call connection paths.

**TARP**

TID Address Resolution Protocol. In OSS, a protocol that resolves a TL-1 TID to a CLNP address (NSAP).

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**TAXI 4B/5B**

Transparent Asynchronous Transmitter/Receiver Interface 4-byte/5-byte. Encoding scheme used for FDDI LANs as well as for ATM. Supports speeds of up to 100 Mbps over multimode fiber. TAXI is the chipset that generates 4B/5B encoding on multimode fiber. See also *4B/5B local fiber*.

**TBOS protocol**

Telemetry Byte Oriented Serial protocol. Protocol that transmits alarm, status, and control points between NE and OSS. TBOS defines one physical interface for direct connection between the telemetry equipment and the monitored equipment.

**TC**

transmission convergence. Sublayer of the ATM physical layer that transforms the flow of cells into a steady flow of bits for transmission over the physical medium. When transmitting, the TC sublayer maps the cells into the frame format, generates the HEC, and sends idle cells when there is nothing to send. When receiving, the TC sublayer delineates individual cells in the received bit stream and uses HEC to detect and correct errors. See also *HEC* and *PHY*.

**T-carrier**

TDM transmission method usually referring to a line or cable carrying a DS-1 signal.

**TCAP**

transaction capabilities application part.

**TCC**

terminating call control.

**TCL Interface**

tool command line interface.

**TCP**

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

**TCP and UDP over Lightweight IP**

See *TULIP*.

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**TCP and UDP over Nonexistent IP**

See *TUNIP*.

**TCP/IP**

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

**TCU**

trunk coupling unit. In Token Ring networks, a physical device that enables a station to connect to the trunk cable.

**TDM**

time-division multiplexing. Technique in which information from multiple channels can be allocated bandwidth on a single wire based on preassigned time slots. Bandwidth is allocated to each channel regardless of whether the station has data to transmit. Compare with *ATDM*, *FDM*, and *statistical multiplexing*.

**TDR**

time domain reflectometer. Device capable of sending signals through a network medium to check cable continuity and other attributes. TDRs are used to find physical layer network problems.

**Technical Assistance Center**

See *TAC*.

**Technical Office Protocol**

See *TOP*.

**Technology prefix**

Discriminators used to distinguish between gateways having specific capabilities within a given zone. In the exchange between the gateway and the gatekeeper, the technology prefix is used to select a gateway after the zone has been selected. Technology prefixes can be used to tell the gatekeeper that a certain technology is associated with a particular call (for example, 15# could mean a fax transmission), or it can be used like an area code

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for more generic routing. No standard defines what the numbers in a technology prefix mean; by convention, technology prefixes are designated by a pound (#) symbol as the last character.

**TEI**

terminal endpoint identifier. Field in the LAPD address that identifies a device on an ISDN interface. See also *TE*.

**TE**

terminal equipment. Any ISDN-compatible device that can be attached to the network, such as a telephone, fax, or computer.

**telco**

Abbreviation for telephone company.

**Telecommunication Management Network**

See *TMN*.

**telecommunications**

Term referring to communications (usually involving computer systems) over the telephone network.

**Telecommunications Industry Association**

See *TIA*.

**telephony**

Science of converting sound to electrical signals and transmitting it between widely removed points.

**Telemetry Asynchronous Block Serial**

See *TABS*.

**telex**

Teletypewriter service allowing subscribers to send messages over the PSTN.

**telemetry**

Capability of transmitting or retrieving data over long distance communication links, such as satellite or telephone.

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**Telnet**

Standard terminal emulation protocol in the TCP/IP protocol stack. Telnet is used for remote terminal connection, enabling users to log in to remote systems and use resources as if they were connected to a local system. Telnet is defined in RFC 854.

**Tempest**

U.S. military standard. Electronic products adhering to the Tempest specification are designed to withstand EMP. See also *EMP*.

**TERENA**

Trans-European Research and Education Networking Association. Organization that promotes information and telecommunications technologies development in Europe. Formed by the merger of EARN and RARE. See also *EARN* and *RARE*.

**termid**

SNA cluster controller identification for switched lines only. Also called *Xid*.

**terminal**

Simple device at which data can be entered or retrieved from a network. Generally, terminals have a monitor and a keyboard, but no processor or local disk drive.

**Terminal Access Controller**

See *TAC*.

**Terminal Access Controller Access System**

See *TACACS*.

**terminal adapter**

Device used to connect ISDN BRI connections to existing interfaces such as EIA/TIA-232. Essentially, an ISDN modem.

**terminal emulation**

Network application in which a computer runs software that makes it appear to a remote host as a directly attached terminal.

**terminal endpoint identifier**

See *TEI*.

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**terminal equipment**

See *TE*.

**terminal server**

Communications processor that connects asynchronous devices such as terminals, printers, hosts, and modems to any LAN or WAN that uses TCP/IP, X.25, or LAT protocols. Terminal servers provide the internetwork intelligence that is not available in the connected devices.

**terminator**

Device that provides electrical resistance at the end of a transmission line to absorb signals on the line, thereby keeping them from bouncing back and being received again by network stations.

**TEST**

test.

**Texas Higher Education Network**

See *THEnet*.

**TFTP**

Trivial File Transfer Protocol. Simplified version of FTP that allows files to be transferred from one computer to another over a network.

**TH**

transmission header. SNA header that is appended to the SNA basic information unit (BIU). The TH uses one of a number of available SNA header formats. See also *FID0*, *FID1*, *FID2*, *FID3*, and *FID4*.

**THC over X.25**

See *THC over X.25* in the “Cisco Systems Terms and Acronyms” section.

**THEnet**

Texas Higher Education Network. Regional network comprising over 60 academic and research institutions in the Texas (United States) area.

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**Thinnet**

Term used to define a thinner, less expensive version of the cable specified in the IEEE 802.3 10Base2 standard. Compare with *Cheapernet*. See also *10Base2*, *Ethernet*, and *IEEE 802.3*.

**three-way handshake**

Process whereby two protocol entities synchronize during connection establishment.

**throughput**

Rate of information arriving at, and possibly passing through, a particular point in a network system.

**TIA**

Telecommunications Industry Association. Organization that develops standards relating to telecommunications technologies. Together, the TIA and the EIA have formalized standards, such as EIA/TIA-232, for the electrical characteristics of data transmission. See also *EIA*.

**TIC**

Token Ring interface coupler. Controller through which an FEP connects to a Token Ring.

**TID**

Terminal Identifier.

**TINA-C**

Telecommunications Information Networking Architecture. Services applications built in C and corresponding to TINA guidelines.

**TIOS**

Transpath Input Output Subsystem

**TIRKS**

Trunk Information Record Keeping System. Bellcore OSS that provides record keeping for interoffice trunk facilities. See also *OSS*.

**time-division multiplexing**

See *TDM*.



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**time domain reflectometer**

See *TDR*.

**Time Notify**

See *TNotify*.

**timeout**

Event that occurs when one network device expects to hear from another network device within a specified period of time, but does not. The resulting timeout usually results in a retransmission of information or the dissolving of the session between the two devices.

**Time To Live**

See *TR VLAN*.

**TL-1**

Transaction Language One. Bellcore term for intelligent network elements.

**TLAP**

TokenTalk Link Access Protocol. Link-access protocol used in a TokenTalk network. TLAP is built on top of the standard Token Ring data-link layer.

**TM**

traffic management.

**TMN**

Telecommunication Management Network. ITU-T generic model for transporting and processing OAM&P information for a telecommunications network. See also *OAM&P*.

**TN3270**

Terminal emulation software that allows a terminal to appear to an IBM host as a 3278 Model 2 terminal.

**TNotify**

Time Notify. Specifies how often SMT initiates neighbor notification broadcasts. See also *SMT*.

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**token**

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

**token bus**

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

**token passing**

Access method by which network devices access the physical medium in an orderly fashion based on possession of a small frame called a token. Contrast with *circuit switching* and *contention*. See also *token*.

**Token Ring**

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

**Token Ring interface coupler**

See *TIC*.

**TokenTalk Link Access Protocol**

See *TLAP*.

**TokenTalk**

Apple Computer's data-link product that allows an AppleTalk network to be connected by Token Ring cables.

**TOP**

Technical Office Protocol. OSI-based architecture developed for office communications.

**topology**

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

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**ToS**

type of service. See *CoS*.

**TP0**

Transport Protocol Class 0. OSI connectionless transport protocol for use over reliable subnetworks. Defined by ISO 8073.

**TP4**

Transport Protocol Class 4. OSI connection-based transport protocol. Defined by ISO 8073.

**TPD**

Mechanism used by some ATM switches that allows the remaining cells supporting an AAL5 frame to be discarded when one or more cells of that AAL5 frame are dropped. This avoids sending partial AAL5 frames through the ATM network when they will have to be retransmitted by the sender. Compare with *EPD*.

**TPPMD**

twisted-pair physical medium dependent.

**traceroute**

Program available on many systems that traces the path a packet takes to a destination. It is mostly used to debug routing problems between hosts. There is also a traceroute protocol defined in RFC 1393.

**traffic management**

Techniques for avoiding congestion and shaping and policing traffic, Allows links to operate at high levels of utilization by scaling back lower-priority, delay-tolerant traffic at the edge of the network when congestion begins to occur.

**Traffic path**

Route of a bearer channel that carries voice traffic.

**traffic policing**

Process used to measure the actual traffic flow across a given connection and compare it to the total admissible traffic flow for that connection. Traffic outside of the agreed upon flow can be tagged (where the CLP bit is set to 1) and can be discarded en route if

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congestion develops. Traffic policing is used in ATM, Frame Relay, and other types of networks. Also known as admission control, permit processing, rate enforcement, and UPC. See also *tagged traffic*.

**traffic profile**

Set of CoS attribute values assigned to a given port on an ATM switch. The profile affects numerous parameters for data transmitted from the port including rate, cell drop eligibility, transmit priority, and inactivity timer. See also *CoS*.

**traffic shaping**

Use of queues to limit surges that can congest a network. Data is buffered and then sent into the network in regulated amounts to ensure that the traffic will fit within the promised traffic envelope for the particular connection. Traffic shaping is used in ATM, Frame Relay, and other types of networks. Also known as metering, shaping, and smoothing.

**trailing packet discard**

See *TPD*.

**trailer**

Control information appended to data when encapsulating the data for network transmission. Compare with *header*.

**transaction**

Result-oriented unit of communication processing.

**transaction services layer**

Layer 7 in the SNA architectural model. Represents user application functions, such as spreadsheets, word-processing, or e-mail, by which users interact with the network. Corresponds roughly with the *application layer* of the OSI reference model. See also *data flow control layer*, *data-link control layer*, *path control layer*, *physical control layer*, *presentation services layer*, and *transaction services layer*.

**transceiver**

See *MAU*.

**transceiver cable**

See *AUI*.

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**Trans-European Research and Education Networking Association**

See *TERENA*.

**transfer syntax**

Description on an instance of a data type that is expressed as a string of bits.

**transit bridging**

Bridging that uses encapsulation to send a frame between two similar networks over a dissimilar network.

**translational bridging**

Bridging between networks with dissimilar MAC sublayer protocols. MAC information is translated into the format of the destination network at the bridge. Contrast with *encapsulation bridging*.

**transmission control layer**

Layer 4 in the SNA architectural model. This layer is responsible for establishing, maintaining, and terminating SNA sessions, sequencing data messages, and controlling session level flow. Corresponds to the *transport layer* of the OSI model. See also *data flow control layer*, *data-link control layer*, *path control layer*, *physical control layer*, *presentation services layer*, and *transaction services layer*.

**Transmission Control Protocol**

See *TCAP*.

**Transmission Control Protocol/Internet Protocol**

See *TCP/IP*.

**transmission convergence**

See *TC*.

**transmission group**

In SNA routing, one or more parallel communications links treated as one communications facility.

**transmission header**

See *TH*.

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**transmission link**

See *link*.

**TRANSPAC**

Major packet data network run by France Telecom.

**Transparent Asynchronous Transmitter/Receiver Interface 4-byte/5-byte**

See *TAXI 4B/5B*.

**transparent bridging**

Bridging scheme often used in Ethernet and IEEE 802.3 networks in which bridges pass frames along one hop at a time based on tables associating end nodes with bridge ports. Transparent bridging is so named because the presence of bridges is transparent to network end nodes. Contrast with *SRB*.

**TransPath component**

The part of your signaling controller system where signals are identified, converted, and routed.

**transport layer**

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

**Transport Protocol Class 0**

See *TP0*.

**Transport Protocol Class 4**

See *TP4*.

**trap**

Message sent by an SNMP agent to an NMS, console, or terminal to indicate the occurrence of a significant event, such as a specifically defined condition or a threshold that was reached. See also *alarm* and *event*.

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**tree topology**

LAN topology similar to a bus topology, except that tree networks can contain branches with multiple nodes. Transmissions from a station propagate the length of the medium and are received by all other stations. Compare with *bus topology*, *ring topology*, and *star topology*.

**TRIP**

See *TRIP* (Token Ring Interface Processor) in the “Cisco Systems Terms and Acronyms” section.

**TRISL**

Token Ring Inter-Switch Link

**Trivial File Transfer Protocol**

See *TFTP*.

**trunk**

Physical and logical connection between two switches across which network traffic travels. A backbone is composed of a number of trunks.

**trunk coupling unit**

See *TCU*.

**trunk up-down**

See *TUD*.

**TR VLAN**

Token Ring virtual LAN

**TSI**

transmitting subscriber information. Frame that can be sent by the caller with the caller’s telephone number that can be used to screen calls.

**TSP**

tag-switched path.

**TTL**

Time To Live. Field in an IP header that indicates how long a packet is considered valid.

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**tunneling**

Architecture that is designed to provide the services necessary to implement any standard point-to-point encapsulation scheme. See also *encapsulation*.

**TUD**

trunk up-down. Protocol used in ATM networks that monitors trunks and detects when one goes down or comes up. ATM switches send regular test messages from each trunk port to test trunk line quality. If a trunk misses a given number of these messages, TUD declares the trunk down. When a trunk comes back up, TUD recognizes that the trunk is up, declares the trunk up, and returns it to service. See also *trunk*.

**TULIP**

TCP and UDP over Lightweight IP. Proposed protocol for running TCP and UDP applications over ATM.

**TUNIP**

TCP and UDP over Nonexistent IP. Proposed protocol for running TCP and UDP applications over ATM.

**TUV**

German test agency that certifies products to European safety standards.

**two-way simultaneous**

See *TWS* in the “Cisco Systems Terms and Acronyms” section.

**twisted pair**

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

**TYMNET**

See *XStream*.

**Type 1 operation**

IEEE 802.2 (LLC) connectionless operation.



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**Type 2 operation**

IEEE 802.2 (LLC) connection-oriented operation.

**type of service**

See *ToS*.



# U

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**UA**

unnumbered acknowledgement.

**UART**

Universal Asynchronous Receiver/Transmitter. Integrated circuit, attached to the parallel bus of a computer, used for serial communications. The UART translates between serial and parallel signals, provides transmission clocking, and buffers data sent to or from the computer.

**UB Net/One**

Ungermann-Bass Net/One. Routing protocol, developed by UB Networks, that uses hello packets and a path-delay metric, with end nodes communicating using the XNS protocol. There are a number of differences between the manner in which Net/One uses the XNS protocol and the usage common among other XNS nodes.

**UBR**

unspecified bit rate. QoS class defined by the ATM Forum for ATM networks. UBR allows any amount of data up to a specified maximum to be sent across the network, but there are no guarantees in terms of cell loss rate and delay. Compare with *ABR*, *CBR*, and *VBR*.

**UBR+**

unspecified bit rate plus. UBR service complemented by ATM switches that use intelligent packet discard mechanisms such as EPD or TPD. See also *EPD* and *TPD*.

**UCM**

universal call model.

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**UDLP**

UniDirectional Link Protocol. Protocol used by inexpensive, receive-only antennas to receive data via satellite.

**UDP**

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

**U-frame**

Unnumbered frame. One of three SDLC frame formats. See also *I-frame* and *S-frame*.

**UI**

unnumbered information.

**UIO**

Universal I/O serial port (Cisco router).

**UKERNA**

UK Education and Research Networking Association.

**UL**

Underwriters Laboratories. Independent agency within the United States that tests product safety.

**U-law**

Companding technique commonly used in North America. U-law is standardized as a 64-kbps CODEC in ITU-T G.711.

**ULP**

upper-layer protocol. Protocol that operates at a higher layer in the OSI reference model, relative to other layers. ULP is sometimes used to refer to the next-highest protocol (relative to a particular protocol) in a protocol stack.

**unbalanced configuration**

HDLC configuration with one primary station and multiple secondary stations.

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**Underwriters Laboratories**

See *UL*.

**Ungermann-Bass Net/One**

See *UB Net/One*.

**UNI**

User-Network Interface. ATM Forum specification that defines an interoperability standard for the interface between ATM-based products (a router or an ATM switch) located in a private network and the ATM switches located within the public carrier networks. Also used to describe similar connections in Frame Relay networks. See also *NNI*, *Q.920/Q.921*, and *SNI (Subscriber Network Interface)*.

**unicast**

Message sent to a single network destination. Compare with *broadcast* and *multicast*.

**unicast address**

Address specifying a single network device. Compare with *broadcast address* and *multicast address*. See also *unicast*.

**UniDirectional Link Protocol**

See *UCM*.

**uninsured traffic**

Traffic within the excess rate (the difference between the insured rate and maximum rate) for an ATM VCC. This traffic can be dropped by the network if congestion occurs. See also *CLP*, *insured rate*, and *maximum rate*.

**unipolar**

Literally meaning one polarity, the fundamental electrical characteristic of internal signals in digital communications equipment. Contrast with *bipolar*.

**unity gain**

In broadband networks, the balance between signal loss and signal gain through amplifiers.

**Universal Asynchronous Receiver/Transmitter**

See *UCM*.

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**Universal Resource Locator**

See *URL*.

**UNIX**

Operating system developed in 1969 at Bell Laboratories. UNIX has gone through several iterations since its inception. These include UNIX 4.3 BSD (Berkeley Standard Distribution), developed at the University of California at Berkeley, and UNIX System V, Release 4.0, developed by AT&T.

**UNIX-to-UNIX Copy Program**

See *UUCP*.

**unnumbered frames**

HDLC frames used for various control and management purposes, including link startup and shutdown, and mode specification.

**unshielded twisted-pair**

See *UTP*.

**unspecified bit rate**

See *UBR*.

**UPC**

usage parameter control. See *traffic policing*.

**upper-layer protocol**

See *U-law*.

**upstream**

Set of frequencies used to send data from a subscriber to the headend.

**urban legend**

Story, which may start with a grain of truth, that has been retold and end up on the Internet. Some legends that periodically make their rounds include “The Infamous Modem Tax,” “Craig Shergold/Brain Tumor/Get Well Cards,” and “The \$250 Cookie Recipe.” Urban Legends are conceptually similar to space junk that stays in orbit for years.

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**URL**

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

**usage parameter control**

See *traffic policing*.

**USENET**

Initiated in 1979, one of the oldest and largest cooperative networks, with over 10,000 hosts and a quarter of a million users. Its primary service is a distributed conferencing service called news.

**User Datagram Protocol**

See *UDP*.

**User-Network Interface**

See *UNI*.

**UTC**

Coordinated Universal Time. Time zone at zero degrees longitude. Formerly called Greenwich Mean Time (GMT) and Zulu time.

**UTP**

unshielded twisted-pair. Four-pair wire medium used in a variety of networks. UTP does not require the fixed spacing between connections that is necessary with coaxial-type connections. There are five types of UTP cabling commonly used: *Category 1 cabling*, *Category 2 cabling*, *Category 3 cabling*, *Category 4 cabling*, and *Category 5 cabling*. Compare with *STP*. See also *EIA/TIA-586* and *twisted pair*.

**UTS**

P1024C data-link layer protocol.

**UUCP**

UNIX-to-UNIX Copy Program. Protocol stack used for point-to-point communication between UNIX systems.

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**uuencode**

UNIX-to-UNIX encoding. Method of converting binary files to ASCII so that they can be sent over the Internet via e-mail. The name comes from its use by the UNIX operating system's uuencode command. See also *uudecode*.

**uudecode**

UNIX-to-UNIX decode. Method of decoding ASCII files that were encoded using uuencode. See also *uuencode*.

**UVM**

Universal Voice Module.

**UVM-C**

Universal Voice Module-Channelized.

**UVM-U**

Universal Voice Module-Unchannelized.



# V

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**V.24**

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

**V.25bis**

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

**V.32**

ITU-T standard serial line protocol for bidirectional data transmissions at speeds of 4.8 or 9.6 Kbps. See also *V.32bis*.

**V.32bis**

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

**V.34**

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

**V.35**

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

**V.42**

ITU-T standard protocol for error correction using LAPM. See also *LAPM*.

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**VAC**

volts alternating current.

**VAD**

voice activity detection. When enabled on voice port or a dial peer, silence is not transmitted over the network, only audible speech. When VAD is enabled, the sound quality is slightly degraded, but the connection monopolizes much less bandwidth.

**variable bit rate**

See *VBR*.

**variable-length subnet mask**

See *VLSM*.

**VBR**

variable bit rate. QoS class defined by the ATM Forum for ATM networks. VBR is subdivided into a real time (RT) class and non-real time (NRT) class. VBR (RT) is used for connections in which there is a fixed timing relationship between samples. VBR (NRT) is used for connections in which there is no fixed timing relationship between samples, but that still need a guaranteed QoS. Compare with *ABR*, *CBR*, and *UBR*.

**VC**

See *virtual circuit*.

**VCC**

virtual channel connection. Logical circuit, made up of VCLs, that carries data between two end points in an ATM network. Sometimes called a *virtual circuit connection*. See also *VCD*, *VCL*, and *VPI*.

**VCD**

virtual circuit descriptor.

**VCI**

virtual channel identifier. 16-bit field in the header of an ATM cell. The VCI, together with the VPI, is used to identify the next destination of a cell as it passes through a series of ATM switches on its way to its destination. ATM switches use the VPI/VCI fields to

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identify the next network VCL that a cell needs to transit on its way to its final destination. The function of the VCI is similar to that of the DLCI in Frame Relay. Compare with *DLCI*. See also *VCL* and *VPI*.

**VCL**

virtual channel link. Connection between two ATM devices. A VCC is made up of one or more VCLs. See also *VCC*.

**VCN**

virtual circuit number. 12-bit field in an X.25 PLP header that identifies an X.25 virtual circuit. Allows DCE to determine how to route a packet through the X.25 network. See also *LCI* and *LCN*.

**VDC**

volts direct current.

**VDSL**

very-high-data-rate digital subscriber line. One of four DSL technologies. VDSL delivers 13 to 52 Mbps downstream and 1.5 to 2.3 Mbps upstream over a single twisted copper pair. The operating range of VDSL is limited to 1,000 to 4,500 feet (304.8 to 1,372 meters). Compare with *ADSL*, *HDSL*, and *SDSL*.

**vector**

Data segment of an SNA message. A vector consists of a length field, a key that describes the vector type, and vector-specific data.

**Veronica**

very easy rodent oriented netwide index to computer archives. Gopher utility that effectively searches Gopher servers based on a user's list of keywords.

**Versatile Interface Processor**

See *VIP* in the "Cisco Systems Terms and Acronyms" section.

**VF**

variance factor. One of three link attributes exchanged using PTSPs to determine the available resources of an ATM network. VF is a relative measure of CRM normalized by the variance of the aggregate cell rate on the link.

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**VINES**

Virtual Integrated Network Service. NOS developed and marketed by Banyan Systems.

**VIP**

See *VIP* (Versatile Interface Processor) in the “Cisco Systems Terms and Acronyms” section.

**virtual address**

See *network address*.

**virtual channel**

See *virtual circuit*.

**virtual channel connection**

See *VCC*.

**virtual channel identifier**

See *VCD*.

**virtual channel link**

See *VCL*.

**virtual circuit**

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

**virtual circuit connection**

See *VCC*.

**virtual circuit number**

See *VCN*.

**virtual connection**

In ATM, a connection between end users that has a defined route and endpoints. See also *PVC* and *SVC*.

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**Virtual Integrated Network Service**

See *VINES*.

**virtual IP**

See *VIP* in the “Cisco Systems Terms and Acronyms” section.

**virtualization**

Process of implementing a network based on virtual network segments. Devices are connected to virtual segments independent of their physical location and their physical connection to the network.

**virtual LAN**

See *VLAN*.

**virtual LAN internetwork**

See *VLI*.

**Virtual Networking Services**

See *Virtual Networking Services* in the “Cisco Systems Terms and Acronyms” section.

**virtual path**

Logical grouping of virtual circuits that connect two sites. See also *virtual circuit*.

**virtual path connection**

See *VPC*.

**virtual path identifier**

See *VPI*.

**virtual path identifier/virtual channel identifier**

See *VPI/VCI*.

**virtual path link**

See *VPL*.

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**virtual ring**

Entity in an SRB network that logically connects two or more physical rings together either locally or remotely. The concept of virtual rings can be expanded across router boundaries.

**virtual route**

In SNA, a logical connection between subarea nodes that is physically realized as a particular explicit route. SNA terminology for *virtual circuit*. See also *virtual circuit*.

**virtual subnet**

Logical grouping of devices that share a common Layer 3 subnet.

**virtual telecommunications access method**

See *VTAM*.

**Virtual Terminal Protocol**

See *VTP*.

**VLAN**

virtual LAN. Group of devices on one or more LANs that are configured (using management software) so that they can communicate as if they were attached to the same wire, when in fact they are located on a number of different LAN segments. Because VLANs are based on logical instead of physical connections, they are extremely flexible.

**VLI**

virtual LAN internetwork. Internetwork composed of VLANs. See also *VLAN*.

**VLSM**

variable-length subnet mask. Ability to specify a different subnet mask for the same network number on different subnets. VLSM can help optimize available address space.

**VMAC**

Virtual Media Access Control.

**VNS**

See *Virtual Networking Services* in the “Cisco Systems Terms and Acronyms” section.

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**VoATM**

Voice Over ATM. Voice over ATM enables a router to carry voice traffic (for example, telephone calls and faxes) over an ATM network. When sending voice traffic over ATM, the voice traffic is encapsulated using a special AAL5 encapsulation for multiplexed voice.

**VoATM dial peer**

Dial peer connected via an ATM network. VoATM peers point to specific VoATM devices.

**VoFR**

Voice Over Frame Relay. Voice over Frame Relay enables a router to carry voice traffic (for example, telephone calls and faxes) over a Frame Relay network. When sending voice traffic over Frame Relay, the voice traffic is segmented and encapsulated for transit across the Frame Relay network using FRF.12 encapsulation.

**VoFR dial peer**

Dial peer connected via a Frame Relay network. VoFR peers point to specific VoFR devices.

**VoHDLC**

Voice Over HDLC. Voice over HDLC enables a router to carry live voice traffic (for example, telephone calls and faxes) back-to-back to a second router over a serial line.

**VoHDLC dial peer**

Dial peer connected via an HDLC network. VoHDLC peers point to specific VoHDLC devices.

**VoIP**

Voice over IP. The ability to carry normal telephony-style voice over an IP-based internet with POTS-like functionality, reliability, and voice quality

**Voice over IP**

Voice over IP enables a router to carry voice traffic (for example, telephone calls and faxes) over an IP network. In Voice over IP, the DSP segments the voice signal into frames, which are then coupled in groups of two and stored in voice packets. These voice packets are transported using IP in compliance with ITU-T specification H.323.

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**VP**

virtual path. One of two types of ATM circuits identified by a VPI. A virtual path is a bundle of virtual channels, all of which are switched transparently across an ATM network based on a common VPI. See also *VPI*.

**VPC**

virtual path connection. Grouping of VCCs that share one or more contiguous VPL. See also *VCC* and *VPL*.

**VPDN**

virtual private dial-up network. See also *VPN*.

**VPI**

virtual path identifier. 8-bit field in the header of an ATM cell. The VPI, together with the VCI, is used to identify the next destination of a cell as it passes through a series of ATM switches on its way to its destination. ATM switches use the VPI/VCI fields to identify the next VCL that a cell needs to transit on its way to its final destination. The function of the VPI is similar to that of the DLCI in Frame Relay. Compare with *DLCI*. See also *VCD* and *VCL*.

**VPI/VCI**

See *VCD* and *VPI*.

**VPL**

virtual path link. Within a virtual path, a group of unidirectional VCLs with the same end points. Grouping VCLs into VPLs reduces the number of connections to be managed, thereby decreasing network control overhead and cost. A VPC is made up of one or more VPLs.

**VPN**

Virtual Private Network, which Enables IP traffic to travel securely over a public TCP/IP network by encrypting all traffic from one network to another. A VPN uses “tunneling” to encrypt all information at the IP level.

**VRML**

Virtual Reality Modeling Language. Specification for displaying 3-dimensional objects on the World Wide Web. Think of it as the 3-D equivalent of HTML.



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**VSC**

See *VSC* in the *Cisco Systems Terms and Acronyms* section.

**VSI**

Virtual Switch Interface

**VS/VD**

virtual source/virtual destination.

**VT-*n***

Virtual Tributary level *n*. SONET format for mapping a lower-rate signal into a SONET payload. For example, VT-1.5 is used to transport a DS-1 signal. See also *DS-1* and *SONET*.

**VTAM**

virtual telecommunications access method. Set of programs that control communication between LUs. VTAM controls data transmission between channel-attached devices and performs routing functions. See also *LU*.

**VTP**

Virtual Terminal Protocol. ISO application for establishing a virtual terminal connection across a network.

**vtty**

virtual type terminal, but commonly used as virtual terminal lines.



# W

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**WAIS**

Wide Area Information Server. Distributed database protocol developed to search for information over a network. WAIS supports full-text databases, which allow an entire document to be searched for a match (as opposed to other technologies that only allow an index of key words to be searched).

**WAN**

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

**watchdog packet**

Used to ensure that a client is still connected to a NetWare server. If the server has not received a packet from a client for a certain period of time, it sends that client a series of watchdog packets. If the station fails to respond to a predefined number of watchdog packets, the server concludes that the station is no longer connected and clears the connection for that station.

**watchdog spoofing**

Subset of spoofing that refers specifically to a router acting for a NetWare client by sending watchdog packets to a NetWare server to keep the session between client and server active. See also *spoofing*.

**watchdog timer**

1. Hardware or software mechanism that is used to trigger an event or an escape from a process unless the timer is periodically reset.

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2. In NetWare, a timer that indicates the maximum period of time that a server will wait for a client to respond to a watchdog packet. If the timer expires, the server sends another watchdog packet (up to a set maximum). See also *watchdog packet*.

**waveform coding**

Electrical techniques used to convey binary signals.

**Web browser**

See *browser*.

**WDM**

wave division multiplexing

**W-DCS**

Wideband Digital Crossconnect System. SONET DCS capable of crossconnecting DS-1 and VT1.5 signals. See also *DCS*, *DS-1*, *SONET*, and *VT-n*.

**WFQ**

weighted fair queuing. Congestion management algorithm that identifies conversations (in the form of traffic streams), separates packets that belong to each conversation, and ensures that capacity is shared fairly between these individual conversations. WFQ is an automatic way of stabilizing network behavior during congestion and results in increased performance and reduced retransmission.

**wide-area network**

See *WAN*.

**wideband**

See *broadband*.

**wildcard mask**

32-bit quantity used in conjunction with an IP address to determine which bits in an IP address should be ignored when comparing that address with another IP address. A wildcard mask is specified when setting up access lists.

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**WinSock**

Windows Socket Interface. Software interface that allows a wide variety of applications to use and share an Internet connection. WinSock is implemented as *dynamic link library (DLL)* with some supporting programs, such as a dialer program that initiates the connection.

**wiring closet**

Specially designed room used for wiring a data or voice network. Wiring closets serve as a central junction point for the wiring and wiring equipment that is used for interconnecting devices.

**WISCNET**

TCP/IP network in Wisconsin (United States) connecting University of Wisconsin campuses and a number of private colleges. Links are 56 Kbps and T1.

**workgroup**

Collection of workstations and servers on a LAN that are designed to communicate and exchange data with one another.

**Workgroup Director**

See *VSC* in the “Cisco Systems Terms and Acronyms” section.

**workgroup switching**

Method of switching that provides high-speed (100-Mbps) transparent bridging between Ethernet networks, and high-speed translational bridging between Ethernet and CDDI or FDDI.

**World Wide Web**

See *WWW*.

**wrap**

Action taken by an FDDI or CDDI network to recover in the event of a failure. The stations on each side of the failure reconfigure themselves, creating a single logical ring out of the primary and secondary rings.

**WWW**

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



# X

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**X.121**

ITU-T standard describing an addressing scheme used in X.25 networks. X.121 addresses are sometimes called IDNs.

**X.21**

ITU-T standard for serial communications over synchronous digital lines. The X.21 protocol is used primarily in Europe and Japan.

**X.21bis**

ITU-T standard that defines the physical layer protocol for communication between DCE and DTE in an X.25 network. Virtually equivalent to *EIA/TIA-232*. See also *EIA/TIA-232* and *X.25*.

**X.25**

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

**X.25 Level 3**

See *PLP*.

**X.25 Protocol**

See *PLP*.

**X.28**

ITU-T recommendation that defines the terminal-to-PAD interface in X.25 networks. See also *PAD* and *X.25*.

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**X.29**

ITU-T recommendation that defines the form for control information in the terminal-to-PAD interface used in X.25 networks. See also *PAD* and *X.25*.

**X.3**

ITU-T recommendation that defines various PAD parameters used in X.25 networks. See also *PAD* and *X.25*.

**X3T9.5**

Number assigned to the ANSI Task Group of Accredited Standards Committee for their internal, working document describing FDDI.

**X.400**

ITU-T recommendation specifying a standard for e-mail transfer.

**X.500**

ITU-T recommendation specifying a standard for distributed maintenance of files and directories.

**X.75**

ITU-T specification that defines the signaling system between two PDNs. *X.75* is essentially an *NNI*. See also *NNI*.

**X Display Manager Control Protocol**

See *XDMCP*.

**XDMCP**

X Display Manager Control Protocol. Protocol used to communicate between X terminals and workstations running the UNIX operating system.

**XDR**

eXternal Data Representation. Standard for machine-independent data structures developed by Sun Microsystems. Similar to *BER*.

**xDSL**

Group term used to refer to *ADSL*, *HDSL*, *SDSL* and *VDSL*. All are emerging digital technologies using the existing copper infrastructure provided by the telephone companies. xDSL is a high-speed alternative to ISDN.



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**XE**

TransPath Execution Environment. Layer of software providing shared services for all application software on the TransPath and isolating higher-level software from operating system dependencies.

**Xerox Network Systems**

See *XNS*.

**XID**

exchange identification. Request and response packets exchanged prior to a session between a router and a Token Ring host. If the parameters of the serial device contained in the XID packet do not match the configuration of the host, the session is dropped.

**Xid**

See *termid*.

**XML**

eXtensible Markup Language. Text markup language designed to enable the use of SGML on the World-Wide Web. XML allows you to define your own customized markup language.

**XNS**

Xerox Network Systems. Protocol suite originally designed by PARC. Many PC networking companies, such as 3Com, Banyan, Novell, and UB Networks used or currently use a variation of XNS as their primary transport protocol. See also *X Window System*.

**XOT**

X.25 over TCP.

**X Recommendations**

CCITT documents that describe data communication network standards. Well-known ones include X.25 Packet Switching standard, X.400 Message Handling System, and X.500 Directory Services.

**XRemote**

Protocol developed specifically to optimize support for the X Window System over a serial communications link.

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**XStream**

Major public PSN in the United States operated by MCI. Formerly called TYMNET.

**XTagATM**

extended tag ATM.

**X terminal**

Terminal that allows a user simultaneous access to several different applications and resources in a multivendor environment through implementation of X Windows. See also *X Window System*.

**X Window System**

Distributed, network-transparent, device-independent, multitasking windowing and graphics system originally developed by MIT for communication between X terminals and UNIX workstations. See also *X terminal*.

## Z

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**zero code suppression**

Line coding scheme used for transmission clocking. Zero line suppression substitutes a 1 in the 7th bit of a string of 8 consecutive zeros. See also *ones density*.

**ZIP**

Zone Information Protocol. AppleTalk session layer protocol that maps network numbers to zone names. ZIP is used by NBP to determine which networks contain nodes that belong to a zone. See also *ZIP storm* and *zone*.

**ZIP storm**

Broadcast storm that occurs when a router running AppleTalk propagates a route for which it currently has no corresponding zone name. The route is then forwarded by downstream routers, and a ZIP storm ensues. See also *ZIP*.

**zone**

1. collection of all terminals, gateways, and multipoint control units (MCUs) managed by a single gatekeeper. A zone includes at least one terminal, and can include gateways or MCUs. A zone has only one gatekeeper. A zone can be independent of LAN topology and can be comprised of multiple LAN segments connected using routers or other devices.

2. In AppleTalk, a logical group of network devices. See also *ZIP*.

**Zone Information Protocol**

See *ZIP*.

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**zone multicast address**

Data-link-dependent multicast address at which a node receives the NBP broadcasts directed to its zone. See also *NBNS*.

# Cisco Systems Terms and Acronyms

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**address translation gateway**

See *ATG*.

**AIP**

ATM Interface Processor. ATM network interface for Cisco 7000 series routers designed to minimize performance bottlenecks at the UNI. The AIP supports AAL3/4 and AAL5. See also *AAL3/4* and *AAL5*.

**APaRT**

automated packet recognition/translation. Technology that allows a server to be attached to CDDI or FDDI without requiring the reconfiguration of applications or network protocols. APaRT recognizes specific data link layer encapsulation packet types and, when these packet types are transferred from one medium to another, translates them into the native format of the destination device.

**ATG**

address translation gateway. Cisco DECnet routing software function that allows a router to route multiple, independent DECnet networks and to establish a user-specified address translation for selected nodes between networks.

**ATM Interface Processor**

See *AIP*.

**ATM network**

Traditional Cisco ATM network built around BPX switches.

**ATM network interface card**

ESP card that is used as the OC-3 interface to the BPX's BXM.

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**Automated Packet Recognition/Translation**

See *APaRT*.

**autonomous switching**

Feature on Cisco routers that provides faster packet processing by allowing the ciscoBus to switch packets independently without interrupting the system processor.

**BIGA**

Bus Interface Gate Array. Technology that allows the Catalyst 5000 to receive and transmit frames from its packet-switching memory to its MAC local buffer memory without the intervention of the host processor.

**BOBI**

break-out/break-in. VNS feature that allows interworking between Euro-ISDN (ETSI) and other VNS-supported signaling variants, such as DPNSS and QSIG.

**BPX Service Node**

Closely integrated BPX switch, AXIS interface shelf, and extended services processor designed to support ATM and Frame Relay switched virtual circuits, as well as traditional PVCs.

**break-out/break-in**

See *BOBI*.

**Bus Interface Gate Array**

See *BIGA*.

**Call Detail Record**

See *CDR*.

**CAM**

Cisco Access Manager.

**CDP**

Cisco Discovery Protocol. Media- and protocol-independent device-discovery protocol that runs on all Cisco-manufactured equipment including routers, access servers, bridges, and switches. Using CDP, a device can advertise its existence to other devices

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and receive information about other devices on the same LAN or on the remote side of a WAN. Runs on all media that support SNAP, including LANs, Frame Relay, and ATM media.

**CDR**

Call Detail Record. VNS record of voice or data SVCs, which includes calling and called numbers, local and remote node names, data and timestamp, elapsed time, and Call Failure Class fields.

**CEF**

Cisco express forwarding.

**CFRAD**

See *Cisco FRAD*.

**Channel Interface Processor**

See *CIP*.

**CIP**

Channel Interface Processor. Channel attachment interface for Cisco 7000 series routers. The CIP is used to connect a host mainframe to a control unit, eliminating the need for an FEP for channel attachment.

**C-ISUP**

Proprietary Cisco protocol based on ISUP.

**ciscoBus controller**

See *SP*.

**Cisco Discovery Protocol**

See *CDP*.

**Cisco FRAD**

Cisco Frame Relay access device. Cisco product that supports Cisco IOS Frame Relay SNA services and can be upgraded to be a full-function multiprotocol router. The Cisco FRAD connects SDLC devices to Frame Relay without requiring an existing LAN. However, the Cisco FRAD does support attached LANs and can perform conversion from SDLC to Ethernet and Token Ring. See also *FRAD*.

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**Cisco Frame Relay access device**

See *Cisco FRAD*.

**CiscoFusion**

Cisco internetworking architecture that “fuses” together the scalability, stability, and security advantages of the latest routing technologies with the performance benefits of ATM and LAN switching, and the management benefits of VLANs. See also *Cisco IOS*.

**Cisco Internet Operating System**

See *Cisco IOS*.

**Cisco IOS**

Cisco system software that provides common functionality, scalability, and security for all products under the CiscoFusion architecture. Cisco IOS allows centralized, integrated, and automated installation and management of internetworks, while ensuring support for a wide variety of protocols, media, services, and platforms. See also *CiscoFusion*.

**Cisco Link Services**

See *CLS*.

**Cisco Link Services Interface**

See *CLSI*.

**Cisco-trunk (private line) call**

A Cisco-trunk (private line) call is established by the forced connection of a dynamic switched call. A Cisco-trunk call is established during configuration of the trunk and stays up for the duration of the configuration. It optionally provides a pass-through connection path to pass signaling information between the two telephony interfaces at either end of the connection.

**CiscoView**

GUI-based device-management software application that provides dynamic status, statistics, and comprehensive configuration information for Cisco internetworking devices. In addition to displaying a physical view of Cisco device chassis, CiscoView also provides device monitoring functions and basic troubleshooting capabilities, and can be integrated with several leading SNMP-based network management platforms.



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**CLS**

Cisco link services. A front-end for a variety of data-link control services.

**CLSI**

Cisco Link Services Interface. Messages that are exchanged between CLS and data-link users such as APPN, SNA service point, and DLSw+.

**configuration register**

In Cisco routers, a 16-bit, user-configurable value that determines how the router functions during initialization. The configuration register can be stored in hardware or software. In hardware, the bit position is set using a jumper. In software, the bit position is set by specifying a hexadecimal value using configuration commands.

**CPP**

Combinet Proprietary Protocol.

**CxBus**

Cisco Extended Bus. Data bus for interface processors on Cisco 7000 series routers. See also *SP*.

**Data movement processor**

See *DMP*.

**Diffusing update algorithm**

See *DUAL*.

**DistributedDirector**

Method of distributing Web traffic by taking into account Web server availability and relative client-to-server topological distances in order to determine the optimal Web server for a client. DistributedDirector uses the Director Response Protocol to query DRP server agents for BGP and IGP routing table metrics.

**DLSw+**

data-link switching plus. Cisco implementation of the DLSw standard for SNA and NetBIOS traffic forwarding. DLSw+ goes beyond the standard to include the advanced features of the current Cisco RSRB implementation, and provides additional functionality to increase the overall scalability of data-link switching. See also *DLSw* in the main glossary.

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**DMP**

Data Movement Processor. Processor on the Catalyst 5000 that, along with the multiport packet buffer memory interface, performs the frame-switching function for the switch. The DMP also handles translational bridging between the Ethernet and FDDI interfaces, IP segmentation, and intelligent bridging with protocol-based filtering.

**DRP**

Director Response Protocol. Protocol used by the DistributedDirector feature in IP routing.

**DSPU concentration**

Cisco IOS feature that enables a router to function as a PU concentrator for SNA PU 2 nodes. PU concentration at the router simplifies the task of PU definition at the upstream host while providing additional flexibility and mobility for downstream PU devices.

**DUAL**

Diffusing Update Algorithm. Convergence algorithm used in Enhanced IGRP that provides loop-free operation at every instant throughout a route computation. Allows routers involved in a topology change to synchronize at the same time, while not involving routers that are unaffected by the change. See also *Enhanced IGRP*.

**EIGRP**

See *Enhanced IGRP*.

**EIP**

Ethernet Interface Processor. Interface processor card on the Cisco 7000 series routers. The EIP provides high-speed (10-Mbps) AUI ports that support Ethernet Version 1 and Ethernet Version 2 or IEEE 802.3 interfaces, and a high-speed data path to other interface processors.

**Enhanced IGRP**

Enhanced Interior Gateway Routing Protocol. Advanced version of IGRP developed by Cisco. Provides superior convergence properties and operating efficiency, and combines the advantages of link state protocols with those of distance vector protocols. Compare with *IGRP*. See also *IGP*, *OSPF*, and *RIP*.

**Enhanced Interior Gateway Routing Protocol**

See *Enhanced IGRP*.

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**Enhanced Monitoring Services**

Set of analysis tools on the Catalyst 5000 switch, consisting of an integrated RMON agent and the SPAN. These tools provide traffic monitoring, and network segment analysis and management. See also *RMON* and *span*.

**ESP**

Extended Services Processor. Rack-mounted adjunct processor that is co-located with a Cisco BPX/AXIS (all three units comprise a BPX service node) and has IP connectivity to a StrataView Plus Workstation.

**Ethernet Interface Processor**

See *EIP*.

**EXEC**

Interactive command processor of Cisco IOS.

**Extended Services Processor**

See *ESP*.

**Fast Ethernet Interface Processor**

See *FEIP*.

**Fast Sequenced Transport**

See *FST*.

**Fast Serial Interface Processor**

See *FSIP*.

**fast switching**

Cisco feature whereby a route cache is used to expedite packet switching through a router. Contrast with *process switching*.

**FDDI Interface Processor**

See *FIP*.

**FEIP**

Fast Ethernet Interface Processor. Interface processor on the Cisco 7000 series routers. The FEIP supports up to two 100-Mbps 100BaseT ports.

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**FIP**

FDDI Interface Processor. Interface processor on the Cisco 7000 series routers. The FIP supports SASs, DASs, dual homing, and optical bypass, and contains a 16-mips processor for high-speed (100-Mbps) interface rates. The FIP complies with ANSI and ISO FDDI standards.

**FRAS**

Frame Relay access support. Cisco IOS feature that allows SDLC, Token Ring, Ethernet, and Frame Relay-attached IBM devices to connect to other IBM devices across a Frame Relay network. See also *FRAD*.

**FSIP**

Fast Serial Interface Processor. Default serial interface processor for Cisco 7000 series routers. The FSIP provides four or eight high-speed serial ports.

**FST**

Fast Sequenced Transport. Connectionless, sequenced transport protocol that runs on top of the IP protocol. SRB traffic is encapsulated inside of IP datagrams and is passed over an FST connection between two network devices (such as routers). Speeds up data delivery, reduces overhead, and improves the response time of SRB traffic.

**Gateway Discovery Protocol**

See *GDP*.

**GDP**

Gateway Discovery Protocol. Cisco protocol that allows hosts to dynamically detect the arrival of new routers as well as determine when a router goes down. Based on UDP. See also *UDP* in the main glossary.

**generic routing encapsulation**

See *GRE*.

**GRE**

generic routing encapsulation. Tunneling protocol developed by Cisco that can encapsulate a wide variety of protocol packet types inside IP tunnels, creating a virtual point-to-point link to Cisco routers at remote points over an IP internetwork. By

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connecting multiprotocol subnetworks in a single-protocol backbone environment, IP tunneling using GRE allows network expansion across a single-protocol backbone environment.

**helper address**

Address configured on an interface to which broadcasts received on that interface will be sent.

**High-Speed Communications Interface**

See *HSCI*.

**HIP**

HSSI Interface Processor. Interface processor on the Cisco 7000 series routers. The HIP provides one HSSI port that supports connections to ATM, SMDS, Frame Relay, or private lines at speeds up to T3 or E3.

**Hot Standby Router Protocol**

See *HSRP*.

**HSCI**

High-Speed Communications Interface. Single-port interface, developed by Cisco, providing full-duplex synchronous serial communications capability at speeds up to 52 Mbps.

**HSRP**

Hot Standby Router Protocol. Provides high network availability and transparent network topology changes. HSRP creates a Hot Standby router group with a lead router that services all packets sent to the Hot Standby address. The lead router is monitored by other routers in the group, and if it fails, one of these standby routers inherits the lead position and the Hot Standby group address.

**HSSI Interface Processor**

See *HIP*.

**IGRP**

Interior Gateway Routing Protocol. IGP developed by Cisco to address the issues associated with routing in large, heterogeneous networks. Compare with *Enhanced IGRP*. See also *IGP*, *OSPF*, and *RIP*.

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**interface processor**

Any of a number of processor modules used in the Cisco 7000 series routers. See *AIP*, *CIP*, *EIP*, *FEIP*, *FIP*, *FSIP*, *HIP*, *MIP*, *SIP* (*serial interface processor*), and *TRIP*.

**Interior Gateway Routing Protocol**

See *IGRP*.

**Inter-Switch Link**

See *ISL*.

**IOS**

See *Cisco IOS*.

**ISL**

Inter-Switch Link. Cisco-proprietary protocol that maintains VLAN information as traffic flows between switches and routers.

**local adjacency**

Two VNSs that control different VSN areas, but communicate with one another through a Frame Relay PVC, are considered to be locally adjacent.

**MICA**

Multiservice IOS Channel Aggregation. Technology that enables the simultaneous support of remote-access users through both analog modems and ISDN devices.

**MIP**

MultiChannel Interface Processor. Interface processor on the Cisco 7000 series routers that provides up to two channelized T1 or E1 connections via serial cables to a CSU. The two controllers on the MIP can each provide up to 24 T1 or 30 E1 channel-groups, with each channel-group presented to the system as a serial interface that can be configured individually.

**MultiChannel Interface Processor**

See *MIP*.

**native client interface architecture**

See *NCIA*.

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**NCIA**

native client interface architecture. SNA applications-access architecture, developed by Cisco, that combines the full functionality of native SNA interfaces at both the host and client with the flexibility of leveraging TCP/IP backbones. NCIA encapsulates SNA traffic on a client PC or workstation, thereby providing direct TCP/IP access while preserving the native SNA interface at the end-user level. In many networks, this capability obviates the need for a standalone gateway and can provide flexible TCP/IP access while preserving the native SNA interface to the host.

**NetFlow**

Network flow is defined as a unidirectional sequence of packets between given source and destination endpoints. Network flows are highly granular: flow endpoints are identified both by IP address as well as by transport layer application port numbers. (NetFlow also uses IP Protocol, ToS and the input interface port to uniquely identify flows.) Conventional network layer switching handles incoming packets independently, with separate serial tasks for switching, security, services and traffic measurements applied to each packet. With NetFlow switching, this process is applied only to the first packet of a flow. Information from the first packet is used to build an entry in the NetFlow cache. Subsequent packets in the flow are handled via a single streamlined task that handles switching, services, and data collection concurrently.

**NETscout**

Cisco network management application that provides an easy-to-use GUI for monitoring RMON statistics and protocol analysis information. NETscout also provides extensive tools that simplify data collection, analysis, and reporting. These tools allow system administrators to monitor traffic, set thresholds, and capture data on any set of network traffic for any segment.

**NMP**

Network Management Processor. Processor module on the Catalyst 5000 switch used to control and monitor the switch.

**NSP**

Network Service Point.

**physical layer interface module**

See *PLIM*.

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**PLIM**

physical layer interface module. Interface that allows the AIP (ATM Interface Processor) to a variety of physical layers, including TAXI and SONET multimode fiber-optic cable, SDH/SONET single-mode fiber cable, and E3 coaxial cable.

**process switching**

Operation that provides full route evaluation and per-packet load balancing across parallel WAN links. Involves the transmission of entire frames to the router CPU, where they are repackaged for delivery to or from a WAN interface, with the router making a route selection for each packet. Process switching is the most resource-intensive switching operation that the CPU can perform. Contrast with *fast switching*.

**proxy polling**

Technique that alleviates the load across an SDLC network by allowing routers to act as proxies for primary and secondary nodes, thus keeping polling traffic off of the shared links. Proxy polling has been replaced by SDLC Transport. See *SDLC Transport*.

**Reliable SAP Update Protocol**

See *RSUP*.

**Route Processor**

See *RP*.

**Route/Switch Processor**

See *RSP*.

**RP**

Route Processor. Processor module in the Cisco 7000 series routers that contains the CPU, system software, and most of the memory components that are used in the router. Sometimes called a *supervisory processor*.

**RSP**

Route/Switch Processor. Processor module in the Cisco 7500 series routers that integrates the functions of the RP and the SP. See also *RP* and *SP*.



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**RSUP**

Reliable SAP Update Protocol. Bandwidth-saving protocol developed by Cisco for propagating services information. RSUP allows routers to reliably send standard Novell SAP packets only when the routers detect a change in advertised services. RSUP can transport network information either in conjunction with or independently of the Enhanced IGRP routing function for IPX.

**SDLC broadcast**

Feature that allows a Cisco router that receives an all-stations broadcast on a virtual multidrop line to propagate the broadcast to each SDLC line that is a member of the virtual multidrop line.

**SDLC Transport**

Cisco router feature with which disparate environments can be integrated into a single, high-speed, enterprise-wide network. Native SDLC traffic can be passed through point-to-point serial links with other protocol traffic multiplexed over the same links. Cisco routers can also encapsulate SDLC frames inside IP datagrams for transport over arbitrary (non-SDLC) networks. Replaces proxy polling. See also *proxy polling*.

**SDLLC**

SDLC Logical Link Control. Cisco IOS feature that performs translation between SDLC and IEEE 802.2 type 2.

**serial tunnel**

See *STUN*.

**silicon switching**

Switching based on the SSE, which allows the processing of packets independent of the SSP (Silicon Switch Processor) system processor. Silicon switching provides high-speed, dedicated packet switching. See also *SSE* and *SSP (Silicon Switch Processor)*.

**silicon switching engine**

See *SSE*.

**Silicon Switch Processor**

See *SSP*.

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**SIP**

1. SMDS Interface Protocol. Used in communications between CPE and SMDS network equipment. Allows the CPE to use SMDS service for high-speed WAN internetworking. Based on the IEEE 802.6 DQDB standard. See also *DQDB*.

2. serial interface processor.

**SP**

Switch Processor. Cisco 7000-series processor module that acts as the administrator for all CxBus activities. Sometimes called ciscoBus controller. See also *CxBus*.

**SPAN**

Switched Port Analyzer. Feature of the Catalyst 5000 switch that extends the monitoring abilities of existing network analyzers into a switched Ethernet environment. SPAN mirrors the traffic at one switched segment onto a predefined SPAN port. A network analyzer attached to the SPAN port can monitor traffic from any of the other Catalyst switched ports.

**SPNNI connection**

Frame Relay connection between two VNSs in different areas or domains. The SPNNI connection gets its name from the proprietary Network-to-Network Interface protocol that operates over this connection.

**SSE**

silicon switching engine. Routing and switching mechanism that compares the data link or network layer header of an incoming packet to a silicon-switching cache, determines the appropriate action (routing or bridging), and forwards the packet to the proper interface. The SSE is directly encoded in the hardware of the SSP (Silicon Switch Processor) of a Cisco 7000 series router. It can therefore perform switching independently of the system processor, making the execution of routing decisions much quicker than if they were encoded in software. See also *silicon switching* and *SSP*.

**SSP**

Silicon Switch Processor. High-performance silicon switch for Cisco 7000 series routers that provides distributed processing and control for interface processors. The SSP leverages the high-speed switching and routing capabilities of the SSE to

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dramatically increase aggregate router performance, minimizing performance bottlenecks at the interface points between the router and a high-speed backbone. See also *silicon switching* and *SSE*.

**STUN**

serial tunnel. Router feature allowing two SDLC- or HDLC-compliant devices to connect to one another through an arbitrary multiprotocol topology (using Cisco routers) rather than through a direct serial link.

**supervisory processor**

See *RP*.

**Switch Processor**

See *SP*.

**TAC**

A Cisco Technical Assistance Center. There are 4 TACs worldwide.

**TACACS+**

Terminal Access Controller Access Control System Plus. Proprietary Cisco enhancement to Terminal Access Controller Access Control System (TACACS). Provides additional support for authentication, authorization, and accounting. See also *TACACS* in main glossary.

**THC over X.25**

Feature providing TCP/IP header compression over X.25 links, for purposes of link efficiency.

**TRIP**

Token Ring Interface Processor. High-speed interface processor on the Cisco 7000 series routers. The TRIP provides two or four Token Ring ports for interconnection with IEEE 802.5 and IBM Token Ring media with ports independently set to speeds of either 4 or 16 Mbps.

**two-way simultaneous**

See *TWS*.

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**TWS**

two-way simultaneous. Mode that allows a router configured as a primary SDLC station to achieve better utilization of a full-duplex serial line. When TWS is enabled in a multidrop environment, the router can poll a secondary station and receive data from that station while it sends data to or receives data from a different secondary station on the same serial line.

**Versatile Interface Processor**

See *VIP*.

**VIP**

1. Versatile Interface Processor. Interface card used in Cisco 7000 and Cisco 7500 series routers. The VIP provides multilayer switching and runs Cisco IOS. The most recent version of the VIP is VIP2.
2. virtual IP. Function that enables the creation of logically separated switched IP workgroups across the switch ports of a Catalyst 5000 running Virtual Networking Services software. See also *Virtual Networking Services*.

**virtual IP**

See *VIP*.

**Virtual Networking Services**

Software on some Catalyst 5000 switches that enables multiple workgroups to be defined across switches and offers traffic segmentation and access control.

**VNS**

See *Virtual Networking Services*.

**VSC**

Cisco's virtual switch controller.

**WorkGroup Director**

Cisco SNMP-based network-management software tool. Workgroup Director runs on UNIX workstations either as a standalone application or integrated with another SNMP-based network management platform, providing a seamless, powerful management system for Cisco workgroup products. See also *SNMP*.



