Glossary of Terms

This appendix contains a list of the terms and acronyms used in this document.

Numerics

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 *Fast Ethernet* and *IEEE 802.3*.

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, convergence sublayer (CS) and segmentation and reassembly (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 *AAL1*, *AAL2*, *AAL3/4*, *AAL5*, *CS*, and *SAR*. See also *ATM* and *ATM layer*.

AAL1

ATM adaptation layer 1. 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*.

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*.

ABR

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

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*.

active port monitor

A type of monitoring supported by the Switched Port Analyzer (SPAN) that allows you to monitor traffic using a customer-supplied monitoring device, such as an RMON probe, or a trace tool, such as a Network General Sniffer. The trace tool monitors only the LLC traffic that is switched by the monitored port. The MAC frames are not monitored. See also *SPAN*.

adaptive cut-through switching

A switching feature that alternates between cut-through and store-and-forward switching modes based on preset, user-defined error thresholds to optimize performance while providing protection from network errors.

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.

Address Resolution Protocol

See *ARP*.

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.

all-routes explorer

See *ARE*.

ANSI

American National Standards Institute. Voluntary organization comprised 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 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.

application-specific integrated circuit

See *ASIC*.

ARE

All-routes explorer. Explorer packet that traverses an entire SRB network, following all possible paths to a specific destination. Sometimes called all-rings explorer packet.

ARP

Address Resolution Protocol. Internet protocol used to map an IP address to a MAC address. Defined in RFC 826.

ASIC

Application-specific integrated circuit. A development process for implementing integrated circuit designs. Integrated circuit designs which are specific to the intended application, as opposed to designs for general purpose use. Both the Quad Token Ring Port chip and the Quad Media Access Control chip are implemented in ASIC.

ASP

ATM switch processor.

ATM

Asynchronous Transfer Mode. A packet-switching technology developed to support both voice and data on a common network infrastructure. ATM uses fixed-length 53-byte cells and can be transported on both LANs and WANs at a variety of operating rates. Because ATM is also application transparent, it is possible for it to be used to transport voice, data, images, and video on the same network.

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 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*.

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* and *VCC*.

B

backbone

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

backup TrCRF

A type of TrCRF that enables you to configure an alternate route for traffic between undistributed TrCRFs located on separate switches that are connected by a TrBRF, in case the ISL connection between the switches becomes inactive.

balun

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

bandwidth

The 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.

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.

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*.

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*.

bps

bits per second.

BRF

bridge relay function. As defined by the IEEE, an internal bridge function on a Token Ring switch that is responsible for forwarding frames between port groupings with the same logical ring number (CRFs). Within a BRF, source-route bridging or source-route transparent bridging can be used to forward frames. See also *CRF*.

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.

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*.

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 relay function

See *BRF*.

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*.

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

The 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.

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.

burned-in address

See *universally administered address*.

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*.

C

cable

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

call admission control

Traffic management mechanism used in ATM networks that determines whether the network can offer a path with sufficient bandwidth for a requested VCC.

CAC

connection admission control. In ATM, the set of actions taken by the network during the call setup phase (or call renegotiation phase) in order to determine whether a connection request can be accepted or should be rejected.

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*.

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*.

CAU

controlled access unit. A microprocessor-controlled wiring concentrator that is used to form classical Token Rings and that provides management capabilities not available with unpowered, passive MAUs.

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*.

CDP

Cisco Discovery Protocol. A protocol that runs on Cisco devices (including routers, bridges, access servers, and switches) that allows Cisco network management applications to learn the device type and SNMP agent address of neighboring devices. CDP runs at Layer 2 and is media- and network-layer independent, allowing network management to be performed from a system that supports a different network-layer protocol from that being managed.

CDV

cell delay variation. A 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*.

cell

The 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*.

cell payload scrambling

Technique used 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.

cell transfer delay

See *CTD*.

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.

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.

Cisco Discovery Protocol

See *CDP*.

CiscoWorks for Switched Internetworks

See *CWSI*.

circuit

Communications path between two or more points.

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.

CLI

command line interface. An 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*.

client

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

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.

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.

community

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

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.

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.

concentrator

See *hub*.

concentrator relay function

See *CRF*.

congestion

Traffic in excess of network capacity.

congestion avoidance

The 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

A condition in which the re-transmission 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 complemented by intelligent packet discard or ABR congestion feedback mechanisms.

connectionless

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

connection-oriented

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

console

DTE through which commands are entered into a host.

constant bit rate

See *CBR*.

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.

convergence

The 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.

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.

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.

CRF

concentrator relay function. As defined by the IEEE, a logical grouping of ports on a Token Ring switch with the same ring number. Within a CRF, source-route switching is used to forward frames within a port group. Multiple CRFs may exist within a switch. The BRF forwards frames between CRFs. See also *BRF*.

CRM

cell 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.

CS

convergence sublayer. One of the two sublayers of the AAL CPCS, 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 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.

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.

cut-through switching

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*. See also *adaptive cut-through*.

CWSI

CiscoWorks for Switched Internetworks. A grouping of advanced network management capabilities for switched networks that includes TrafficDirector, CiscoView, and VlanDirector.

D

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.

data link layer

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

data terminal equipment

See *DTE*.

data terminal ready

See *DTR*.

DB connector

data bus connector. Type of connector used to connect serial and parallel cables to a data bus. DB connector names are of 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.

dedicated Token Ring

See *DTR*.

delay

The 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.

designated bridge

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

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*.

differential Manchester encoding

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

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*.

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*.

DSAP

destination service access point. One-byte fields in the LLC protocol data unit of 802.2 frames that specifies the sending (SSAP) and receiving (DSAP) network-layer processes between which the frame is being transferred. Both the DSAP and SSAP numbers are assigned by the IEEE. Compare to *SSAP*. See also *SAP*.

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.

DTR

1. 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.

2. Dedicated Token Ring. A specification defined by the Token Ring standard (IEEE 802.5r) standard. The DTR standard has two components: concentrator port, or C-port, capability and full-duplex operation. The C-port capability enables any Token Ring NIC to directly attach to a switch port. The full-duplex support enables 802.5r-compliant NICs to simultaneously transmit and receive, for an aggregate of 32 Mbps. When operating in full-duplex mode, the station and switch use a protocol called Transmit Immediate (TXI) and do not use a token. This allows Token Ring NICs to be connected without a concentrator (e.g., a MAU).

DRiP

Duplicate Ring Protocol. A Cisco-developed protocol that allows the management of ring numbers across multiple, interconnected switches.

Duplicate Ring Protocol

See *DRiP*.

E

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*.

EEPROM

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

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/TIA-232

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

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*, and *Category 5 cabling*.

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*.

electrically erasable programmable read-only memory

See *EEPROM*.

electromagnetic interference

See *EMI*.

Electronic Industries Association

See *EIA*.

electrostatic discharge

See *ESD*.

EMI

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

emulated LAN

See *ELAN*.

encapsulation

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

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 *EEPROM*.

erasable programmable read-only memory

See *EPROM*.

ESD

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

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*.

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 *maximum rate*.

explorer frame

Frame sent out by a networked device in an SRB environment to determine the optimal route to another networked device. It 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* and *spanning-tree explorer*.

F

failure domain

Area in which a failure has 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. Beaconing in turn initiates a process called autoreconfiguration. See also *beacon* and *NAUN*.

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*.

FC

frame control. The portion of a frame that indicates the frame type.

FCS

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

FDDI

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

FDX

See *full-duplex*.

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*.

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.

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.

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.

forwarding

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

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 *FCS*.

frame control

See *FC*.

full duplex

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

G

gigabit

Abbreviated *Gb.*

gigabits per second

Abbreviated *Gbps*.

gigabyte

Abbreviated *GB*.

gigabytes per second

Abbreviated *GBps*.

graphical user interface
　　See *GUI*.

group address
　　See *multicast address*.

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 utilizing a GUI.

H

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. Compare with *full duplex* and
　　simplex.

hardware address
　　See *MAC address*.

HDX
　　See *half duplex*.

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

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

hub
　　1. Generally, a term used to describe a device that serves as the center of a star-topology network.

　　2. Hardware or software device that contains multiple independent but connected modules of
　　network and internetwork equipment. Hubs can be active (where they repeat signals sent through
　　them) or passive (where they do not repeat, but merely split, signals sent through them).

　　3. In Ethernet and IEEE 802.3, an Ethernet multiport repeater, sometimes referred to as a
　　concentrator.

I

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 802.2

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 implementations for Fast Ethernet.

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*.

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 that has arisen around the problem of connecting networks together. The term can refer to products, procedures, and technologies.

interoperability

Ability of computing equipment manufactured by different vendors to communicate with one another successfully over a network.

inter-switch link

See *ISL*.

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 *subnet mask*.

ISL

Inter-Switch Link. A Cisco-defined protocol that enables full-length frames from multiple Ethernet or Token Ring VLANs to be transmitted simultaneously across the same 100 Mbps Fast Ethernet link. The ISL protocol is supported between Cisco switches and routers and servers using NICs that support ISL.proprietary link for interconnecting switches. ISL uses 100-Mbps Ethernet and allows the multiplexing of multiple VLANs over a single link.

K

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.

kilobit

Abbreviated *Kb.*

kilobits per second

Abbreviated *kbps*.

kilobyte

Abbreviated *KB*.

kilobytes per second

Abbreviated *kBps*

L

LAA

locally administered address. A MAC address assigned to an interface that overrides the factory-assigned universally administered address. Assigning an LAA eases network management because the NIC can be replaced without changing the address used by the network to access the station. See also *MAC address*. Compare to *universally administered address*.

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.

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*.

LAN emulation

See *LANE*.

LAN Emulation Client

See *LEC*.

LAN Emulation Address Resolution Protocol

See *LE_ARP*.

LAN Emulation Configuration Server

See *LECS*.

LAN Emulation Server

See *LES*.

LAN Network Manager

See *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*.

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.

latency

The delay associated with the physical transfer of a frame from one port through a switch to another port, which is based on the switch architecture and adds additional delay above and beyond the delay associated with the physical length of the frame being transported through the switch. The latency of a switch would be the time between the first bit of a frame into the switch and the first bit of that frame out of the switch.

LE_ARP

LAN Emulation Address Resolution Protocol. A protocol that provides the ATM address that corresponds to a MAC address.

LEC

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. A 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*.

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.

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*.

light amplification by stimulated emission of radiation

See *laser*.

light emitting diode

See *LED*.

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*.

LNM

LAN Network Manager. IBM's PC-based Token Ring network management product. LNM establishes LLC2 connections to IBM bridges within the Token Ring network and uses agents in these bridges to monitor and collect MAC-layer information about the ring, as well as to issue MAC-layer commands to the ring-attached NICs for control and to request NIC-level status information.

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 utilization of network segments, thus increasing effective network bandwidth.

local-area network

See *LAN*.

locally administered address

See *LAA*.

Logical Link Control

See *LLC*.

Logical Link Control, type 2

See *LLC2*.

LUNI

LAN Emulation User-to-Network Interface. The ATM Forum standard for LAN emulation on ATM networks. LUNI defines the interface between the LAN Emulation Client (LEC) and the LAN Emulation Server components. See also *BUS*, *LES*, and *LECS*.

M

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. This is, in essence, the address of the NIC. Both the transmitting station's MAC address as well as the destination station's MAC address are contained in all LAN frames. MAC addresses are 6 bytes long and are controlled by the IEEE. Also known as a hardware address, a MAC-layer address, or a physical address. See also *universally administered address* and *locally administered 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 *MAC address*.

management domain

A logical grouping of VLANs used by the VLAN Trunking Protocol (VTP) for the purpose of administration and management. VTP parameters are propagated throughout the VLANs within a single management domain. While you can have duplicate VLAN names in a network, each VLAN name within a management domain must be unique. A management domain is not device specific. Different devices may belong to the same management domain if the VLANs defined for the devices belong to the same management domain. Likewise, a device may belong to multiple management domains if the VLANs defined for the device belong to different management domains.

Management Information Base

See *MIB*.

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.

MAU

media access unit.

1) In Ethernet and IEEE 802.3 networks, a device 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 physical layer functions including the conversion of digital data from the Ethernet interface, collision detection, and injection of bits onto the network.

1) In Token Ring networks, a nonpowered device used for forming a classical Token Ring. NICs are attached to the MAU ports via lobe cables. When activated, the NIC provides power (called "phantom drive") to the MAU via its lobe cable to transfer relays in the MAU that cause both the NIC and its lobe cable to be electrically and logically inserted in the ring. When deactivated, the NIC removes the phantom drive voltage, which causes the MAU to electrically bypass the NIC and its lobe cable, allowing the ring to continue via the bypass.

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. 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. See also *maximum burst*.

maximum transmission unit
See *MTU*.

MB
megabyte. Approximately 1,000,000 bytes.

Mb
megabit. Approximately 1,000,000 bits.

Mbps
megabits per second.

Media Access Control
See *MAC*.

media access unit
See *MAU*.

media attachment unit
See *MAU*.

megabit
Abbreviated *Mb*. Approximately 1,000,000 bits.

megabits per second
Abbreviated *Mbps*.

megabyte
Abbreviated *MB*. Approximately 1,000,000 bytes.

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.

microsegmentation

The process of reconfiguring stations from a shared-media LAN to smaller groups, usually one per segment, using LAN switches. A classic Token Ring network, for example, can have as many as 260 stations attached to, and sharing the bandwidth of, a single 16-Mbps ring. Using Token Ring switching, these stations can be segmented into groups of as few as one per switch port. Each group then has a bandwidth of 16 Mbps and, if desired, the affinity grouping of the prior ring can be maintained using VLAN groupings in the switch.

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.

MPOA

Multiprotocol over ATM. A relatively new standardization effort in the ATM Forum that will specify how existing and future network-layer protocols will exploit the unique benefits of ATM. These benefits include quality of service (QOS) and direct connections between different VLANs.

MSAU

multistation access unit. See *MAU*.

MTU

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

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*.

multilayer switch

Switch that filters and forwards packets based on MAC addresses and network addresses. A subset of LAN switch. Compare with *LAN switch*.

multiprotocol over ATM

See *MPOA*.

multistation access unit

See *MSAU*.

N

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.

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.

NDIS

network driver interface specification. Microsoft's specification for a generic, hardware- and protocol-independent device driver for NICs.

nearest active downstream neighbor

See *NADN*.

nearest active upstream neighbor

See *NAUN*.

NetBEUI

NetBIOS Extended User Interface. An 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*.

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.

NetBIOS Extended User Interface

See *NetBEUI*.

network

Collection of computers, printers, routers, switches, and other devices that are able to communicate with each other over some transmission medium.

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 driver interface specification

See *NDIS*.

network interface card

See *NIC*.

Network-to-Network Interface

See *NNI*.

NIC

network interface card. Board that provides network communication capabilities to and from a computer system. Also called an *adapter*.

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.

NNI

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*.

nonvolatile random-access memory

See *NVRAM*.

null modem

Small box or cable used to join computing devices directly, rather than over a network.

NVRAM

nonvolatile RAM. RAM that retains its contents when a unit is powered off.

O

OC

Optical Carrier. Series of physical protocols (OC-1, OC-2, OC-3, and so on), 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*.

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*.

online insertion and removal

See *OIR*.

Optical Carrier

See *OC*.

optical fiber

See *fiber-optic cable*.

P

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 switching

Networking method in which nodes share bandwidth with each other by sending packets.

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.

passive port monitor

A type of monitoring supported by SPAN that monitor allows you to monitor all the frames on a particular ring, including the MAC frames.

payload

Portion of a cell, frame, or packet that contains upper-layer information (data).

payload type identifier

See *PTI*.

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)* and *CBR*.

PDU

protocol data unit. OSI term for packet. See also *BPDU* and *packet*.

peak cell rate

See *PCR*.

peak rate

Maximum rate, in kilobits per second, at which a virtual circuit can transmit.

permanent virtual circuit

See *PVC*.

PFP

Proprietary Fat Pipe. An interface from a switch to a Cisco ProStack port. Switches can be connected together using the 140-Mbps full-duplex ProStack and function as one operational system.

physical address

See *MAC address*.

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.

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's UNI specification with additional mechanisms for source routing, crankback, and alternate routing of call setup requests.

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-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*.

port

Interface on an internetworking device (such as a switch).

POST

power-on self test. Set of hardware diagnostics that runs on a hardware device when that device is powered up.

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*.

proprietary fat pipe

See *PFP*.

protocol data unit

See *PDU*.

PTI

payload type identifier. A 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.

PVC

permanent virtual circuit. 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. Called a permanent virtual connection in ATM terminology. Compare with *SVC*.

Q

QMAC

quad media access controller. An ASIC chip containing that contains four Token Ring protocol handlers. Together with the QTP chip it provides four distinct Token Ring attachment ports.

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.

quad media access controller

See *QMAC*.

quad Token Ring port

See *QTP*.

quality of service

See *QOS*.

QTP

quad Token Ring port. An ASIC chip that provides the necessary functions for switching directly between the four Token Ring ports of a QMAC, or between these and any other port within the switch.

R

RAM

random-access memory. Volatile memory that can be read and written by a microprocessor.

random-access memory

See *RAM*.

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*.

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.

remote monitoring

See *RMON*.

repeater

Device that regenerates and propagates electrical signals between two network segments. See also *segment*.

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.

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 in/ring out

See *RI/RO*.

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 parameter server

See *RPS*.

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.

RI/RO

ring in, ring out. Connectors on a MAU (or CAU) used to cable multiple wiring concentrators in series to form a classical Token Ring of up to 260 NICs.

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.

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.

Routing Information Field

See *RIF*.

Routing Information Identifier

See *RII*.

RPS

ring parameter server. A network management function that may reside on a Token Ring to provide a ring number, soft error report timer values, and physical location information in response to a Request Parameters MAC frame sent from a NIC during insertion into the ring.

RS-232

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

S

SAP

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*.

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.

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.

segment

Section of a network that is bounded by bridges, routers, or switches.

segmentation and reassembly

See *SAR*.

service access point

See *SAP*.

service specific convergence sublayer.

See *SSCS*.

shielded twisted-pair

See *STP*.

Simple Network Management Protocol

See *SNMP*.

simple server redundancy protocol
See *SSRP*.

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-route explorer packet
See *spanning-tree explorer packet*.

SMAC
source media access control. MAC address specified in the Source Address field of a packet. Compare with *DMAC*. See also *MAC address*.

SMDS
Switched Multimegabit Data Service. High-speed, packet-switched, datagram-based WAN networking technology offered by the telephone companies.

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.

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.

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*.

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.

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

source-route bridging
See *SRB*.

source-route translational bridging
See *SR/TLB*.

source-route transparent bridging
See *SRT*.

SPAN

Switched Port Analyzer. The SPAN port capability on Cisco switches provide the ability to mirror the traffic from any switch port to the SPAN. Network analyzers and RMON probes can be connected to the port for in-depth troubleshooting. one Token Ring port on a switch on another port, providing a powerful network troubleshooting tool.

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 *STA*. See also *spanning tree* and *Spanning-Tree Protocol*.

spanning-tree 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*.

Spanning-Tree Protocol

Bridge protocol that utilizes 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 *STP*. See also *BPDU*, *MAC address learning*, *spanning tree*, and *spanning-tree algorithm*.

SRAM

static random access memory. 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 a 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*.

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*.

SSAP

source service access point. The SAP of the network node designated in the Source field of a packet. Compare to *DSAP*. See also *SAP*.

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.

SSRP

simple server redundancy protocol. A Cisco value-add that provides backup capability for LANE 1.0 servers, including the LECS, LES, and BUS. LANE 1.0 did not specify a method for doing this.

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*.

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 *ring topology*.

store-and-forward

Frame forwarding 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*.

STP

shielded twisted-pair. Two-pair wiring medium used in a variety of network implementations. STP cabling has a layer of shielded insulation to reduce EMI. Compare with *UTP*. See also *twisted pair*.

subnet mask

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

Subnetwork Access Protocol

See *SNAP*.

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

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.

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*.

T

TC

transmission convergence. A 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.

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.

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.

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.

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.

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.

token

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

TokenChannel

A parallel configuration of 2 to 8 ports between two Catalyst 3900s. Can also be used with the Catalyst 3920.

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*. 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*.

topology

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

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 congestion develops. Traffic policing is used in ATM, Frame Relay, and other types of networks. Also know as *admission control*, *permit processing*, *rate enforcement*, and *UPC (usage parameter control)*.

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.

translational bridging

Bridging between networks with dissimilar MAC sublayer protocols. MAC information is translated into the format of the destination network at the bridge.

transmission convergence

See *TC*.

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*.

TrBRF

See *BRF*.

TrCRF

See *CRF*.

trunk

Physical and logical connection between two switches across which network traffic travels. A backbone is composed of a number of trunks.

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*.

U

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.

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 (available bit rate)*, *CBR*, and *VBR*.

undistributed TrCRF

The standard type of TrCRF. The undistributed TrCRF is located on one switch and has a logical ring number associated with it. Multiple undistributed TrCRFs located on the same or separate switches can be associated with a single parent TrBRF. The parent TrBRF acts as a multiport bridge, forwarding traffic between the undistributed TrCRFs.

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*.

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*.

universally administered address

Factory-assigned MAC address that is unique to each device.

unshielded twisted-pair

See *UTP*.

unspecified bit rate

See *UBR*.

uplinks

A term used to refer to any high-speed connection between two or more switches, between a switch and a router, a channel, and so forth. Examples include ISL, ATM, FDDI, and PFP.

User-Network Interface

See *UNI*.

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*.

V

variable bit rate

See *VBR*.

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 (available bit rate), 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 *VCI* and *VPI*.

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 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.

VCL

virtual channel link. Connection between two ATM devices. A VCC is made up of one or more VCLs. See also VCC.

virtual channel connection

See *VCC*.

virtual channel identifier

See *VCI*.

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 (a PVC) or switched (an SVC). Virtual circuits are used in Frame Relay and X.25. In ATM, a virtual circuit is called a virtual channel. Sometimes abbreviated VC. See also *PVC*, *SVC*, *VCI*, and *VPI*.

virtual LAN

See *VLAN*.

virtual path identifier

See *VPI*.

virtual path identifier/virtual channel identifier

See *VPI/VCI*.

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.

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.

VLAN Trunking Protocol

See *VTP*.

VPC

virtual path connection. Grouping of VCCs that share one or more contiguous VPLs. See also *VCC*.

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. See also *VCI*.

VPI/VCI

See *VCI* and *VPI*.

VTP

VLAN Trunking Protocol. Cisco-defined protocol used to configure and manage virtual LANs across a switch network.

W

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.