APPENDIX

C

Glossary

1BASE5 A baseband Ethernet system operating at 1 Mbps over one pair of UTP cable.

10BASE-T A baseband Ethernet system operating at 10 Mbps over two pairs of Category 3 UTP cable.

100BASE-T Baseband Ethernet transmission of 100 Mbps.

100BASE-TX A baseband Ethernet system operating at 100 Mbps over two pairs of STP or Category 5 UTP cable.

1000BASE-SX A baseband Ethernet system operating at 1000 Mbps over two multimode optical fibers using shortwave laser optics.

access domain A set of nodes among which MAC arbitration can occur.

access point A node that is configured to transmit and receive radio signals in a wireless LAN (WLAN).

access priority The priority used to determine access privileges on a shared LAN segment relative to other nodes that have frames queued.

active monitor A node in a Token Ring LAN that is responsible for handling many boundary conditions and housekeeping functions.

adapter The interface between a node and the network.

address A unique identifier of a node or network interface.

ad hoc A method of allowing wireless nodes to communicate directly with one another.

aggregated link A set of two or more physical links that appear to higher-layer entities as if they were a single higher-capacity link.

aggregator The entity that performs the operations required to make multiple physical links function as an aggregated link.

Address Resolution Protocol (ARP) A protocol that maps the IP address to the MAC address of a node or an interface.

aging process A process used in a spanning tree environment that removes dynamic entries from the filtering database when the associated nodes have been inactive for a specified time.

aging time A process used in a spanning tree environment that specifies the time after which a dynamic filtering database entry will be removed if its associated node has been continuously inactive.

AppleTalk A protocol suite developed by Apple Computer, used in Macintosh computers and other compatible nodes.

application A process or program running on a node.

application flow A stream of frames or packets among communicating processes within a set of end nodes.

Application layer The highest layer of the seven-layer OSI model.

application service provider (ASP) An online business that delivers and manages software over the Internet.

application-based VLAN A VLAN where the association of a frame to a VLAN is determined by application-specific information.

ARP cache A data structure that provides the current mapping of IP addresses to MAC addresses.

asymmetric digital subscriber line (ADSL) The most common form of DSL used in home networks. It is popular in home networks because it offers higher bandwidth for download.

Asynchronous Transfer Mode (ATM) A networking standard that supports high-speed communications for both data and voice transmission.

autonegotiation A technique used in Ethernet environments that operate over point-to-point links, where the node at each end of the link can learn the capabilities of the node at the other end and automatically configure itself to match the other end.

autosense A process that allows an interface that supports both traditional and fast Ethernet speeds the capability to automatically sense the medium that is being used.

backbone A network used primarily to interconnect other networks.

backoff The mechanism used in the Ethernet MAC (CSMA/CD) to reschedule a transmission in the event of a collision.

backpressure A technique used to stop a node from sending frames by using the half-duplex MAC mechanisms afforded by the underlying LAN.

bandwidth The data-carrying capacity of a node or communications channel, usually expressed in bits per second.

baud An analog signaling unit of measure.

best-effort service A data delivery service where frames or packets are delivered to a destination with an understanding that delivery of the data is probable but is not guaranteed.

bit An atomic unit of data representing either a 0 or a 1.

bit stuffing A technique that provides a unique frame delimiter pattern yet maintains payload data transparency by inserting an extra 0 bit after every occurrence of five 1 bits in the payload data stream.

bit time The length of time required to transmit 1 bit of information; equal to the reciprocal of the data rate.

blocking In connectionless networks, a characteristic of a switch, switch fabric, or network interface implying that it is not capable of handling traffic at the maximum frame and/or data arrival rate without having to discard traffic (in the worst case) due to a lack of internal resources.

blocking state A stable state in the Spanning Tree Protocol in which a bridge port will receive BPDUs but will neither receive nor transmit data frames.

bottleneck A point in a data communications path or computer processing flow that limits overall throughput or performance.

bridge An internetworking node that relays frames among its ports based upon Data Link layer information.

bridge port A network interface on a bridge.

bridge priority An administratively controlled value that is catenated with the bridge's MAC address to create a bridge identifier.

bridge transit delay The delay between the receipt of a frame on one port and the forwarding of that frame onto another port of a bridge.

bridged LAN A collection of networks (typically LANs) interconnected at the Data Link layer using bridges.

broadband A technique of data transmission that carries multiple data channels over a shared wire.

broadcast address A well-known multicast address signifying the set of all nodes.

brouter A node combining the functions of a bridge and a router.

browser An application program providing a graphical user interface to Internet or intranet services.

buffer A block of memory used to temporarily store data while it is being processed.

burst mode A modification to the flow control algorithm originally used in the NetWare (IPX) protocol suite. In burst mode, a node may continue to transmit information even if there are multiple outstanding packets awaiting acknowledgment.

byte An 8-bit unit of data.

call-back unit A node that calls a user at a pre-programmed telephone number when a connection is requested to prevent unauthorized access from unknown locations.

campus switch A switch used within a campus backbone. Campus switches are generally high-performance nodes that aggregate traffic streams from multiple buildings and departments within a site.

canonical format Synonymous with little-endian format.

carrier sense In Ethernet, the act of determining whether the shared communications channel is currently in use by another node.

catenet A collection of networks connected together at the Data Link layer. Also known as a *bridged LAN*.

chassis switch A switch implemented in a modular fashion, with a base chassis and a set of plug-in blades chosen for a particular application environment.

cheapernet A slang term for thin-wire coaxial Ethernet (10BASE2).

classification engine The module within a switch that is responsible for examining incoming frames and classifying them as to VLAN association, priority, and so on.

client (1) Application software (typically resident in an end-user work node) designed to operate through cooperation and communication with a companion server application (typically resident in a dedicated multitasking computer system). (2) An architectural entity using the services of a lower-layer service provider (for example, a Transport layer entity may be a client of a Network layer service provider).

cluster A group of nodes that are integrated together to serve a common purpose.

coaxial cable A communications medium built as a pair of concentric cylindrical conductors.

collapsed backbone A method of interconnecting networks by using a switch or router as a central relay node.

collector The module within a link aggregator responsible for gathering frames received from multiple, underlying physical links.

collision A simultaneous transmission attempt by two or more nodes on a shared Ethernet LAN.

collision detection The act of detecting a collision.

collision domain The set of nodes among which a collision can occur. Nodes on the same shared LAN are in the same collision domain; nodes in separate collision domains do not contend for use of a common communications channel.

collision fragment The portion of an Ethernet frame that results from a collision. On a properly configured and operating LAN, collision fragments are always shorter than the minimum length of a valid frame.

common and internal spanning tree (CIST) A collection of the internal spanning trees in a multiple spanning tree region, combined with the common spanning tree that connects MST regions to form a single spanning tree that ensures all LANs in the bridge network are fully connected and loop-free.

common spanning tree (CST) A single spanning tree that interconnects multiple MST regions.

communications channel The medium and Physical layer nodes that convey signals among communicating nodes.

communications medium The physical medium used to propagate signals across a communications channel (for example, optical fiber, coaxial cable, twisted pair cable).

configuration message In the Spanning Tree Protocol, a BPDU that carries the information needed to compute and maintain the spanning tree.

congestion The state where the offered network load approaches or exceeds the locally available resources designed to handle that load (for example, link capacity or memory buffers).

connectionless A communications model in which nodes can exchange data without first establishing a connection. In connectionless communications, each frame or packet is handled independently of all others.

connection-oriented A communications model in which nodes establish a connection before proceeding with data exchange and in which the data constitutes a flow that persists over time.

consultant A person who borrows your watch, then charges you for the time of day.

conversation As used in link aggregation, a set of traffic among which ordering must be maintained.

copy port Synonymous with *mirror port*.

core switch A VLAN-aware switch that connects exclusively to other VLAN-aware nodes.

crossbar A common name for a crosspoint matrix switch fabric.

crossover cable An Ethernet cable that is used to connect nodes of like types to one another for data communication.

crosspoint matrix A switch fabric designed to provide simultaneous transient connections between any input port and any available output port.

cut-through A mode of switch operation where frames can be forwarded before they are fully received.

datagram A frame or a packet, depending on the encapsulation used.

Data Link layer The second layer of the seven-layer OSI model, responsible for frame delivery across a single link.

data storage density The quantity of data that can be stored within a data storage medium.

D-compliant A bridge or switch that complies with IEEE 802.1D.

decapsulation The process of removing protocol headers and trailers to extract higher-layer protocol information carried in the data payload.

decibel The standard unit of measurement used for wireless radio signaling.

decoder The entity within the Physical layer responsible for converting signals received from a communications channel into binary data.

dedicated bandwidth A configuration in which the communications channel attached to a network interface is dedicated for use by a single node and does not have to be shared.

default port A switch port configured to be the target destination port for traffic received on other ports and for which the lookup process fails.

default priority The priority assigned to a received frame when none of the administratively configured policy rules apply to it.

deferral The mechanism by which a half-duplex Ethernet node withholds its own transmissions when another node is currently using the shared communications channel.

demilitarized zone (DMZ) Used to help secure LANs from outside attacks.

denial of service Normally used to refer to a malicious attack on a LAN in an attempt to render a node or group of nodes unusable.

departmental switch Synonymous with *workgroup switch*.

designated bridge In the Spanning Tree Protocol, the bridge responsible for forwarding traffic from the direction of the root bridge onto a given link.

designated port In the Spanning Tree Protocol, a port through which a designated bridge forwards traffic onto a given link in the direction away from the root bridge.

desktop switch A switch used to connect directly to end user nodes.

driver The software used to provide an abstraction of the hardware details of a network or peripheral node interface.

dialup A method of network connectivity that is done between a PC and a network over a standard telephone line.

digital subscriber line An Internet service that provides home users and small businesses a cost effective ability to access the Internet over normal phone lines at high speeds.

disabled state A stable state in the Spanning Tree Protocol state machine in which a bridge port will not receive or transmit any frames.

disaster recovery (DR) A plan to maintain or restore network services after the occurrence of a catastrophic event.

distributed backbone A shared-bandwidth network used to interconnect other networks, where the backbone communications medium (rather than a central relay node) is used to attach to the lower level networks.

distribution function The algorithm used by a distributor to assign conversations to particular physical links within an aggregation.

distributor The module within a link aggregator responsible for assigning frames submitted by higher-layer clients to the individual underlying physical links.

Domain Name System (DNS) Used to map host names with IP addresses.

download The act of receiving and storing data from a remote node to a local node.

Dynamic Domain Name System (DDNS) A system of mapping IP addresses to host names. DDNS works with dynamic IP addresses.

Dynamic Host Configuration Protocol (DHCP) A network protocol that is used to assign an IP address to nodes when they join the network.

E1 A T-carrier technology commonly used in Europe, capable of multiplexing 32 DS-0 (64 Kbps) channels for a total data-carrying capacity of 2.048 Mbps.

edge switch A switch located at the boundary between a VLAN-unaware domain and a VLAN-aware domain of a catenet.

egress filter A qualification function implemented in an output port of a VLAN-aware switch.

egress rule The rule used to determine whether a frame is transmitted in tagged or untagged format on the output port of a switch. If a frame belonging to a given VLAN is sent tagged, every node that is a member of that VLAN and directly connected to that port must be tag-aware.

encapsulating bridge A bridge that encapsulates LAN frames for transmission across a backbone.

encapsulation The process of taking data provided by a higher-layer entity as the payload for a lower-layer entity and applying a header and trailer as appropriate for the protocol in question.

encoder The entity within the Physical layer responsible for converting binary data into signals appropriate for transmission across the communications channel.

end-of-frame delimiter A symbol or set of symbols used to indicate the end of the Data Link (or MAC) encapsulation.

end-of-stream delimiter A symbol or set of symbols used to indicate the end of the Physical layer encapsulation.

enterprise network The set of LAN, MAN, and/or WAN networks and internetworking nodes comprising the communications infrastructure for a geographically distributed organization.

enterprise switch A switch used within an enterprise backbone.

error control A procedure used to recover from detected errors.

error detection A procedure used to detect whether received information contains errors.

error rate The ratio of bits (or frames) received in error to the total number of bits (or frames) received.

Ethernet The popular name for a family of LAN technologies standardized by IEEE 802.3.

explorer frame In source routing, a frame used either to perform route discovery or to propagate multicast traffic. There are two types of explorer frames: spanning tree explorers and all routes explorers.

extranet A network that allows access from users that are outside of the controlled LAN.

Fast Ethernet An Ethernet system operating at 100 Mbps.

fast path The code thread that is traversed most often and that is usually highly optimized for performance.

fiber optic cable A network cable designed for high-speed data transfer over long distances. The fiber optic cable consists of multiple glass fibers that are wrapped in an insulated case. Signals within a fiber optic cable are carried over pulses of light.

filtering The process of inspecting frames received on an input port of a switch and deciding whether to discard or forward them.

filtering database A data structure within a bridge that provides the mapping from destination address to bridge port (in a D-compliant bridge), or from the combination of destination address and VLAN to bridge port (in a Q-compliant bridge).

firewall Software and/or hardware used specifically to protect a computer or network from being accessed by unauthorized users.

firmware Software that is embedded in a node.

flooding The action of forwarding a frame on to all ports of a switch except the port on which it arrived.

flow control A mechanism that prevents a sender of traffic from sending faster than the receiver is capable of receiving.

forwarding The process of taking a frame received on an input port of a switch and transmitting it on one or more output ports.

forwarding delay A parameter of the Spanning Tree Protocol that defines the delay imposed between transitions from one state to another.

forwarding state A stable state in the Spanning Tree Protocol in which a bridge port will transmit frames received from other ports as determined by the bridge forwarding algorithm.

fragmentation A technique whereby a packet is subdivided into smaller packets so that they can be sent through a network with a smaller maximum transmission unit.

frame The Data Link layer encapsulation of transmitted or received information.

frame check sequence A block check code used to detect errors in a frame.

frame relay A Layer 2 protocol that is used to transfer data over a WAN.

full duplex A mode of communication whereby a node can simultaneously transmit and receive data across a communications channel.

gateway (1) A node capable of relaying user application information among networks employing different architectures and/or protocol suites. (2) An internetworking node operating at the Transport layer or above. (3) An old term for an IP router. (4) A marketing name for anything that connects anything to anything else.

Gigabit Ethernet An Ethernet system operating at 1000 Mbps.

gigabits per second (Gbps) One billion bits per second.

gigahertz (GHz) The radio signal transmission frequency of one billion cycles per second.

globally administered address A node or interface identifier whose uniqueness is ensured through the use of an assigned organizationally unique identifier (OUI), typically by the manufacturer of the node or interface.

group address Synonymous with *multicast address*.

guru Richard Bramante.

hacker A person who has evaded network security with the intention of modifying computer software, hardware configuration, and other security measures to either damage their effective operation or compromise them to the point where data theft can be accomplished without them being detected.

half duplex A mode of communication in which a node can either transmit or receive data across a communications channel.

hardware address Synonymous with *MAC address*, *physical address*, and *unicast address*.

hash function An algorithm that distributes items evenly into one of a number of possible buckets in a hash table.

header A protocol-specific field or fields that precede the encapsulated higher-layer data payload.

hello time In the Spanning Tree Protocol, the interval between configuration messages as generated by the root bridge.

high-water mark An indicator that the number of entries or bytes in a queue has risen above a predetermined level.

hop A unit of measurement used to describe the path between a source and a destination.

hop count A measure of the number of routers through which a packet has passed.

host In an IP network, a synonym for *end node*.

hub (1) A central interconnection node as used in a star-wired topology. (2) A repeater.

implicit tag A method of mapping an untagged frame to its associated VLAN by inspection of the frame's contents.

individual port A switch port that cannot form an aggregated link with any other port.

ingress filter A qualification function implemented in an input port of a VLAN-aware switch.

ingress rule A rule used to classify a frame as to its VLAN association.

integrated services digital network (ISDN) A technology that supports the transmission of both data and voice over an existing phone line.

interframe gap The spacing between time-sequential frames.

internal spanning tree The spanning tree that has been calculated to run within an MST region.

Internet A well-known set of networks interconnected by routers using the Internet Protocol (IP).

internet A set of networks interconnected at the Network layer by routers.

Internet Protocol (IP) The internetwork protocol used in the Internet, specified in RFC 791.

Internet service provider (ISP) The entity that provides Internet access to homes and businesses.

internetwork A set of networks interconnected at the Network layer by routers.

internetwork protocol The protocol used to move frames from originating source nodes to their ultimate target destinations.

internetworking node A node used to relay frames or packets among a set of networks (for example, a bridge or router).

IP address An address assigned to network nodes in order to transmit data at the Network layer.

IPSec A protocol that implements security in an IP network.

isoEthernet A variant of Ethernet developed by National Semiconductor Corp. (and standardized in IEEE 802.9a) that provides an isochronous communication channel in addition to a 10 Mbps Ethernet LAN.

jabber control A method used to prevent a node from transmitting continuously and thereby disrupting a shared communications channel.

jam In Ethernet, the process of sending an additional 32 data bits following the detection of a collision to ensure that all parties to the collision properly recognize the event as such.

jumbo frame A frame longer than the maximum frame length allowed by a standard.

kilobit (kb) The equivalent of 1000 bits.

kilobits per second (Kbps) One thousand bits per second.

kilobyte (KB) 1024 bytes.

LAN segmentation The practice of dividing a single LAN into a set of multiple LANs interconnected by bridges.

LAN switch A switch that interconnects local area networks.

Layer 2 switch Synonymous with *bridge*.

Layer 3 switch Synonymous with *router*.

Layer 4 switch A router that can make routing policy decisions based on Transport layer information (for example, TCP port identifiers) encapsulated within packets.

leaky VLAN A VLAN that may, under certain boundary conditions, carry frames that do not belong to that VLAN.

learning process The process whereby a bridge builds its filtering database by gleaning address-to-port mappings from received frames.

learning state A transition state in the Spanning Tree Protocol state machine where a bridge port is learning address-to-port mappings to build its filtering database before entering the forwarding state.

Lightweight Directory Access Protocol (LDAP) A protocol that allows the development and management of directories, or databases, that contain information about nodes, personnel, and other aspects of the network.

line driver An electronic or optical node used to convey line signals onto a physical communications medium.

line receiver An electronic or optical node used to extract line signals from a physical communications medium.

link aggregation A process to increase both the capacity and availability of a communications channel.

link cost A metric assigned to a link, used to compute the spanning tree.

listening state A transition state in the Spanning Tree Protocol state machine in which a bridge port is listening for BPDUs transmitted by other bridge ports to determine whether it should proceed to the learning state.

load balancing The practice of allocating traffic across multiple nodes, interfaces, or communications links to evenly distribute offered load and obtain maximum benefit from the available resources.

local area network (LAN) A network with a relatively small geographical extent.

locally administered address A node or interface identifier whose uniqueness is established by a network administrator rather than by the manufacturer of the node or interface.

LocalTalk An Apple Computer–proprietary LAN technology employing CSMA/CA access control at a data rate of 230 Kbps.

low-water mark An indicator that the number of entries or bytes in a queue has dropped below a predetermined level.

MAC address A bit string that uniquely identifies one or more nodes or interfaces as the source or destination of transmitted frames. IEEE 802 MAC addresses are 48 bits in length and may be either unicast (source or destination) or multicast (destination only).

MAC address–based VLAN A catenet where the association of a frame to a VLAN is determined by the source MAC address in the frame.

MAC algorithm The set of procedures used by the nodes on a LAN to arbitrate for access to the shared communications channel (for example, CSMA/CD, token passing).

managed object An atomic element of an SNMP MIB with a precisely defined syntax and meaning, representing a characteristic of a managed node.

managed security service provider (MSSP) An ISP that provides additional network security management, which may include virus scanning, intrusion detection, and firewall capabilities.

maximum transmission unit (MTU) The maximum size of a unit of data.

Media Access Control (MAC) The entity or algorithm used to arbitrate for access to a shared communications channel.

megabit (Mb) One million bits.

megabits per second (Mbps) One million bits per second.

megabyte (MB) 1024 kilobytes.

megahertz (MHz) One million cycles per second.

microsegmentation A network configuration model in which each individual node connects to a dedicated port on a switch.

mirror port A switch port configured to reflect the traffic appearing on another one of the switch's ports.

modem A node used to convert digital data to, or from, analog signals for transmission across an analog communications channel.

modulation The process of manipulating a waveform to create a signal that sends a message that needs to be communicated. In data communications, modulation is performed by a node that converts a digital signal to an analog signal, in order to be communicated over a phone line.

monitored port A port on a switch whose traffic is replicated to a mirror port for the purpose of external traffic monitoring.

MTU discovery A process whereby a node can determine the largest frame or packet that can be transferred across a catenet or internetwork without requiring fragmentation.

multicast address A method of identifying a set of one or more nodes as the destination for transmitted data.

multicast pruning A technique whereby traffic is propagated only on those links necessary to deliver it to the nodes listening to a particular multicast address.

multihoming Configuration of multiple network interfaces on a single computer.

multimode fiber An optical fiber that allows signals to propagate in multiple transmission modes simultaneously, ultimately limiting both its bandwidth and maximum extent.

multiple spanning tree bridge A bridge that supports the common spanning tree and at least one multiple spanning tree instance.

multiple spanning tree configuration table A table that maps all VLANs to a common spanning tree or to a multiple spanning tree instance.

multiple spanning tree instance A spanning tree within a multiple spanning tree region.

Multiple Spanning Tree Protocol (MSTP) The Multiple Spanning Tree Protocol allows for a separate spanning tree for each VLAN group while also blocking redundant links.

multiple spanning tree region LANs and multiple spanning tree bridges that connect to each other by ports on the multiple spanning tree bridges. Each LAN must designate a common internal spanning tree bridge that must also be a multiple spanning tree bridge. Each connected port must either be a designated port on one of the LANs or a nondesignated port on a multiple spanning tree bridge that connects to one of the LANs.

multiplexing The act of combining multiple data streams into a single signal and then transmitting the data over a shared medium.

NetWare A network operating system and related software components developed by Novell.

network A set of nodes and communication links that allow computers to intercommunicate.

network access server (NAS) A gateway device protecting access to a protected network resource

Network Address Translation (NAT) A networking protocol that allows the separation of public and private addresses within a LAN.

network administrator (1) A person responsible for managing the day-to-day operations of a network. (2) The person blamed for all computing problems, whether they are related to the network or not.

network architecture A model of the operation and behavior of nodes attached to a network, typically as a series of layered protocol entities.

Network Basic Input/Output System (NetBIOS) A protocol that provides computer services on a network.

network interface A subsystem that provides the means for a computer or internetworking node to attach to a communications link.

network interface card (NIC) A network adapter that provides a hardware interface between an end node and the network.

Network layer The third layer of the seven-layer OSI model, responsible for routing packets across an internetwork.

network management The process of configuring, monitoring, controlling, and administering network operation.

network management agent An entity (typically a combination of software and hardware) within a node that is responsible for gathering network management information and reporting it to a network management node as appropriate.

Network Time Protocol (NTP) A protocol that is used to synchronize system clocks of nodes in a LAN.

nibble A 4-bit unit of data (half of a byte).

node Any device that connects to a LAN.

nonblocking In connectionless networks, a characteristic of a switch, switch fabric, or network interface implying that it is capable of handling traffic at the maximum frame and data arrival rates without ever having to discard traffic due to a lack of internal resources.

null modem cable A cable that allows serial port to serial port communication.

one-armed router A router (typically connected to a VLAN-aware switch) that forwards traffic among multiple logical networks through a single physical interface.

operating system The software responsible for managing the underlying hardware in a computer.

optical fiber A network cable designed for high-speed data transfer over long distances. The fiber optic cable consists of multiple glass fibers that are wrapped in an insulated case. Signals within a fiber optic cable are carried over pulses of light.

overprovisioning A technique of providing more capacity than is actually needed for a given application.

packet The Network layer encapsulation of transmitted or received information.

patch cable An Ethernet cable that is used to link nodes that are close to one another. Patch cables are normally made using a stranded sheath, which makes it more pliable and less likely to be broken when transporting them from location to location.

path cost The sum of the link costs between a given bridge port and the root bridge, used to compute the spanning tree.

pause_time The parameter of an Ethernet flow control message that indicates the length of time for which a node should cease data transmission.

Physical layer The lowest layer of the seven-layer OSI model, responsible for transmission and reception of signals across the communications medium.

ping A utility program used to test for network connectivity by using the Echo Request and Echo Response mechanisms of ICMP.

port A network interface on a bridge, switch, or node.

port identifier A value assigned to a port that uniquely identifies it within a switch. The Spanning Tree and Link Aggregation Control Protocols both use port identifiers.

port mirroring A process whereby one switch port (the mirror port) is configured to reflect the traffic appearing on another one of the switch's ports (the monitored port).

port number A locally assigned, bridge-unique number identifying each port on the bridge.

port priority An administratively controlled value that is catenated with a port number to create a port identifier.

port-based VLAN A catenet where the association of a frame to a VLAN is determined by the switch port on which the frame arrived.

preamble A frame field used to allow a receiver to properly synchronize its clock before decoding incoming data.

Presentation layer The sixth layer of the seven-layer OSI model, responsible for converting information between a local format and a common network format.

priority The principle whereby preferential treatment is given to certain network nodes, applications, or traffic over others.

priority regeneration A technique used in a VLAN-aware switch to map locally significant, natively signaled user priority levels into globally significant values.

priority tag A tag adhering to the syntax of IEEE 802.1Q, but used solely to indicate frame priority as opposed to a VLAN association.

promiscuous mode A mode of operation of a network interface in which it receives all traffic regardless of destination address.

protocol A set of behavioral algorithms, message formats, and message semantics used to support communications between entities across a network.

protocol analyzer A network management tool that is used to parse and decode frames for the purpose of monitoring and/or isolating faults in a network.

protocol stack A set of layered protocol entities that implement a given network architecture.

protocol-based VLAN A catenet in which the association of a frame with a VLAN is determined by the Network layer protocol encapsulated by the frame.

Q-compliant A bridge or switch that complies with IEEE 802.1Q.

quality of service (QoS) A collection of networking techniques that are used to provide data delivery guarantees with predictable results.

Rapid Spanning Tree Protocol (RSTP) An enhancement to the original Spanning Tree Protocol; provides for a faster convergence when there is a change in the topology of the spanning tree group.

reassembly The process of reconstructing a packet from its fragments.

relay entity The architectural abstraction within an internetworking node that transfers data among the ports of the node.

remote bridge A bridge that has at least one port connected to a WAN link to allow a catenet to span geographically dispersed LANs.

repeater A node used to interconnect LAN segments at the Physical layer.

ring number A locally assigned, catenet-unique value identifying each ring in a source-routed catenet.

RMON probe A node capable of passively monitoring network traffic, gathering statistics related to that traffic, and reporting it to a network management node using SNMP.

root bridge In the Spanning Tree Protocol, the bridge in the catenet with the numerically lowest value for its bridge identifier.

root port In the Spanning Tree Protocol, the port through which a designated bridge forwards traffic in the direction of the root bridge.

route descriptor A catenation of a ring number and a bridge number within the routing information field of a source-routed frame.

route discovery The process of determining the available route(s) between a pair of nodes in a source-routed catenet.

router An intermediate node operating as a Network layer relay node.

routing The process of relaying packets between networks.

segment A subset of a larger network.

serial cable A cable that connects to a serial port and allows for bi-direction data flow between a node and a PC or an external modem.

serial port A port that connects to a serial cable and allows for bi-direction data flow between a node and a PC or an external modem.

server (1) Application software designed to operate with a companion client application. 2) An architectural entity providing services to a higher-layer client.

Session layer The fifth layer of the seven-layer OSI model, responsible for process-to-process communication.

shared bandwidth A characteristic of a communications channel in which the available capacity is shared among all the attached nodes.

shared bus A type of switch fabric that uses a common communications channel as the mechanism for frame exchange among the switch ports.

shared media A physical communications medium that supports the connection of multiple nodes, each of which may transmit and/or receive information across the common communications channel.

shared memory A type of switch fabric that uses a common memory pool as the mechanism for frame exchange among the switch ports.

singlemode fiber An optical fiber that allows signals to propagate in only one transmission mode.

sink The ultimate destination of a frame or packet on a network. A sink absorbs and removes the frame or packet from the network, as opposed to relaying or forwarding it to another link.

sniffer A network analyzer.

source The original sender of a frame or packet on a network. A source generates new frames that may be forwarded by internetworking nodes, and which are absorbed by the ultimate destination.

source pruning A technique used within multicast pruning in which the source of a multicast stream is turned off if it is known that there are no nodes currently listening to the stream.

source routing A method of bridging where the path through the catenet is determined by the communicating end nodes rather than the bridges, and frames carry explicit routing information. Used exclusively in Token Ring and some FDDI LANs.

source routing bridge A bridge used in a source-routed catenet.

spanning forest A set of multiple spanning trees in a single catenet. Traffic for any given VLAN propagates over a single spanning tree in the forest.

spanning tree A loop-free topology used to ensure that frames are neither replicated nor resequenced when bridged among nodes in a catenet.

Spanning Tree Protocol (STP) A protocol used by bridges to determine, establish, and maintain a loop-free topology that includes every reachable link in a catenet.

stackable switch A switch equipped with a means of connection to other similar switches such that the set of interconnected switches can be configured and managed as if it were a single switch.

standing request A method of switch fabric arbitration where an input port requests the use of a specified output port and is notified at a later time when that request can be granted.

start-of-frame delimiter (SFD) A symbol or set of symbols used to indicate the beginning of the Data Link (or MAC) encapsulation.

start-of-stream delimiter (SSD) A symbol or set of symbols used to indicate the beginning of the Physical layer encapsulation.

store-and-forward A mode of switch operation where frames are completely received before they are forwarded on to any of the output ports of the node.

straight-through cable A twisted pair cable that is wired for normal DTE-to-DCE communications.

stream The Physical layer encapsulation of transmitted or received information.

strict priority A method of priority scheduling where higher priority traffic is always processed before lower priority traffic.

subnet mask A 32-bit field that, when logically with an IP address, produces the network portion of that address. The bits of a subnet mask are set to 1 for those bits that correspond to the network portion of the associated IP address and to 0 otherwise.

subnet-based VLAN A catenet where the association of a frame to a VLAN is determined by the network portion of the IP source address contained within the frame.

switch Synonymous with *internetworking node*.

switch fabric The mechanism used to transfer frames from the input ports of a switch to its output ports.

switch mirroring A process whereby one switch port is configured to reflect the traffic appearing on all other ports of the switch.

switched LAN A LAN characterized by the use of a switching hub rather than a repeater hub as the central node.

switching hub A switch used as a central interconnection node in a star-wired topology.

symbol An encoded bit or group of bits. A symbol is the atomic unit of data at the Physical layer of the OSI model.

T1 A T-carrier technology capable of multiplexing 24 DS-0 (64 kbps) channels, for a total data-carrying capacity of 1.536 Mbps.

tag-aware domain A region of a virtual bridged network in which all nodes are tag-aware.

tag-awareness A property of a node that supports and can use VLAN tags.

tagged frame A frame that includes a VLAN tag.

task force A subcommittee within an IEEE 802 working group that is responsible for the development of a particular standard or standards.

throughput A measure of the rate of data transfer between communicating nodes, typically in bits per second.

time-to-live (TTL) A field within an IP packet used for lifetime control. Routers decrement the TTL field; packets can be discarded if the value ever reaches 0.

token A mechanism used to administer access control among nodes on a token bus or Token Ring LAN. Under normal conditions, only the node in possession of the token may transmit frames.

token bus A LAN whose MAC algorithm uses token passing among nodes on a logical bus topology.

token domain The access domain of a LAN using a token-passing MAC (for example, token bus or Token Ring). See also *access domain*.

token reservation A mechanism that allows nodes to arbitrate for the future use of a token at a given priority level.

Token Ring A LAN whose MAC algorithm uses token passing among nodes on a logical ring topology.

token-passing A method of arbitrating access to a shared LAN where control is passed among the attached nodes through the use of a token.

topology The physical or logical layout of a network.

topology change An event that evokes recomputation of the spanning tree in a catenet.

trailer A protocol-specific field or fields that follow the encapsulated higher-layer data payload.

translational bridge A transparent bridge that interconnects LANs that use different frame formats.

transparent bridging A method of bridging in which the path through the catenet is determined by the bridges themselves and nodes can communicate without any knowledge of the presence or action of those bridges.

Transport layer The fourth layer of the seven-layer OSI model, which typically provides reliable end-to-end message delivery across the underlying potentially unreliable network.

trap An unsolicited message sent from a network management agent to a network management node, usually to signal a significant event.

trunk A common name for an aggregated link.

tunnel A node used to encapsulate one protocol within another, often at the same layer of their respective architectures.

twisted pair A communications medium consisting of two helically intertwined copper conductors.

type encapsulation The Ethernet frame format in which the Length/Type field identifies the protocol type of the encapsulated data rather than its length.

unified threat management A device that operates on Layers 2 through 7 and is capable of providing firewall along with the ability of performing content filtering.

unmanaged switch A switch that does not support any remote network management capability.

untagged frame A frame that does not include a VLAN tag.

uplink port A switch port designed to connect to a backbone switch or network. An uplink port often supports a higher data rate than the attachment ports of the switch.

upload The act of sending data from a local node to a remote node.

user priority The priority associated with the application submitting a frame. User priority is carried end-to-end across a catenet.

virtual bridged network A catenet that comprises one or more VLAN-aware nodes, allowing the definition, creation, and maintenance of virtual LANs.

virtual LAN (VLAN) A subset of the nodes, applications, and/or links within a catenet, as defined by their logical relationship rather than their physical connectivity.

VLAN association rule An algorithm used to map a frame to the VLAN to which it belongs.

VLAN tag A field inserted into a frame that provides an explicit indication of the VLAN association for that frame.

VLAN-awareness A property of a node that supports and can use VLAN capabilities within a catenet.

wide area network (WAN) A network with far-reaching geographical extent. Typically, the links comprising WANs are owned by, and leased from, common carriers, which imposes a recurring cost as a function of distance and/or data rate.

wire speed The maximum frame and data arrival rate possible on a given network interface. Wire speed on a 100 Mbps Ethernet implies rates of 100 million bits per second and 148,809.5 frames per second.

wireless fidelity (WiFi) A term that describes certain types of 802.11 WLANs.

wiring closet A room used to house and interconnect network and/or telecommunications equipment. Hubs, switches, and routers are typically installed in wiring closets.

workgroup switch A switch used within a single department or workgroup.

working group A group formed by interested members of an organization. The working group can have open meetings, as well as communication through Internet forums and mailing lists. The working group works on issues relating to standards and standards development.

Worldwide Interoperability for Microwave Access (WiMAX [IEEE 802.16]) A task force responsible for the IEEE 802.16 standards for broadband wireless access networks.

X.25 A suite of protocols, used in packet-switched networks, that encompasses Layers 1 through 3 of the OSI reference model

zone A set of logically related nodes within an AppleTalk internetwork. Nodes in the same zone can communicate as a single workgroup regardless of whether they are on the same or different networks. An AppleTalk zone constitutes a Network layer VLAN.

APPENDIX

D

Acronyms

AAL1: ATM adaptation layer 1
AAL2: ATM adaptation layer 2
AAL5: ATM adaptation layer 5
AARP: AppleTalk Address Resolution Protocol
ABR: Available bit rate
AC: Access control
AC: Alternating current
ACK: Acknowledgment
ADSL: Asymmetric digital subscriber line
ADSP: AppleTalk Data Stream Protocol
AFP: AppleTalk Filing Protocol
AIM: AOL Instant Messenger
ALG: Application layer gateway
AN: Access network
ANSI: American National Standards Institute
AP: Access point
API : Application program interface

APIPA: Automatic private IP address

ARB: All routes broadcast

ARCnet: Attached Resource Computer network

ARE: All routes explorer

ARP: Address Resolution Protocol

ASCII: American Standard Code for Information Interchange

ASIC: Application-specific integrated circuit

ASN.1: Abstract Syntax Notation 1

ASP: AppleTalk Session Protocol

ATC: ATM transfer capability

ATM: Asynchronous Transfer Mode

ATM MPE: ATM Transfer Capability

ATP: AppleTalk Transaction Protocol

AURP: AppleTalk Update-based Routing Protocol

BER: Bit error rate

BERT: Bit error rate test

BGP: Border Gateway Protocol

BGP4: BGP version 4

BOOTP: Bootstrap Protocol

BPDU: Bridge protocol data unit

bps: Bits per second

Bps: Bytes per second

BRI: Basic rate interface

CAM: Content-addressable memory

CAT5: Category 5 cable

CATV: Community antenna television

CBR: Constant bit rate

CCITT: International Consultative Committee for Telephone and Telegraph

CCD: Clear channel data

CDDI: Copper distributed data interface

CFI: Canonical format indicator

CIDR: Classless interdomain routing

CIST: Common and internal spanning tree

CLNP: Connectionless Network Protocol
CMIP: Common Management Interface Protocol
CMT: Connection management
CMTS: Cable modem termination system
COAX: Coaxial cable
CODEC: Coder/decoder
CoS: Class of service
CPU: Central processing unit
CRC: Cyclic redundancy check
CSMA/CA: Carrier Sense Multiple Access with Collision Avoidance
CSMA/CD: Carrier Sense Multiple Access with Collision Detection
CST: Common spanning tree
CTD: Cell transfer delay
DA: Destination address
dB: Decibel
DBR: Deterministic bit rate
DC: Direct current
DDNS: Dynamic Domain Name System
DDP: Datagram Delivery Protocol
DDR: Double-data rate
DEC: Digital Equipment Corporation
DECnet: Digital Equipment Corporation Network Architecture
DEUNA: Digital Ethernet UNIBUS Network Adapter
DHCP: Dynamic Host Configuration Protocol
DiffServ: Differentiated services
DIX: Digital–Intel–Xerox
DMA: Direct memory access
DMS: Digital multiplex switch
DMZ: Demilitarized zone
DNS: Domain Name System
DOS: Disk Operation System
DoS: Denial of service
DPM: Downtime performance measure

DPNSS: Digital private network signaling system
DPT: Dynamic packet trunking
DQDB: Distributed queue dual bus
DRAM: Dynamic random access memory
DRP: DECnet Routing Protocol
DSAP: Destination service access point
DSCP: DiffServe code point
DSL: Digital subscriber line
DSP: Digital signal processing
DSLAM: Digital subscriber line access multiplexer
DSPVC: Dynamic soft permanent virtual circuit
DSVD: Digital simultaneous voice and data
DTMF: Dual-tone multi-frequency
DTR: Data terminal ready
DTR: Dedicated Token Ring
DWDM: Dense wavelength division multiplexing
E-RIF: Embedded routing information field
ECC: Error-correcting code
ECL: Emitter-coupled logic
ECMP: Equal cost multipath
ECS: Encryption control signal
ED: End delimiter
EEPROM: Electrically erasable programmable read-only memory
EIA: Electronic Industries Association
EMI: Electromagnetic interference
FC: Frame control
FCS: Frame check sequence
FDDI: Fiber distributed data interface
FE: Fast Ethernet
FIFO: First in/first out
FIRE: Flexible intelligent routing engine
FLR: Frame loss rate
FOIRL: Fiber-optic inter-repeater link

FPGA: Field-programmable gate array
FR: Frame relay
FS: Frame status
FTP: File Transfer Protocol
GARP: Generic Attribute Registration Protocol
Gbps: Gigabits per second
GE: Gigabit Ethernet
GHz: Gigahertz
GigE: Gigabit Ethernet
GMRP: GARP Multicast Registration Protocol
GQOS: Guaranteed quality of service
GVRP: GARP VLAN Registration Protocol
GW: Gateway
HDLC: High-level data link control
HDSL: High (bit-rate) digital subscriber line
HILI: High-level interface
HTTP: Hypertext Transfer Protocol
Hz: Hertz
IAD: Integrated access device
IANA: Internet Assigned Number Authority
IBM: International Business Machines
IC: Integrated circuit
ICMP: Internet Control Message Protocol
IEEE: Institute of Electrical and Electronics Engineers
IETF: Internet Engineering Task Force
IFG: Interframe gap
I/O: Input/output
IP: Internet Protocol
IPX: Internetwork Packet eXchange
ISDN: Integrated Services Digital Network
ISIS: Intermediate system to intermediate system
ISO: International Organization for Standardization
ISP: Internet service provider

IST: Internal spanning tree
ITU: International Telecommunications Union
IVL: Independent VLAN learning
Kbps: Kilobits per second
LACP: Link Aggregation Control Protocol
LAN: Local area network
LAT: Local area transport
LDAP: Lightweight Directory Access Protocol
LDP: Label Distribution Protocol
LE: Local exchange
LED: Light-emitting diode
LEN: Line equipment number
LER: Label edge router
LF: Largest frame
LFI: Link fragmentation and interleaving
LFSR: Linear feedback shift register
LLC: Logical link control
LLQ: Low latency queuing
LRU: Least recently used
LSAP: Link service access point
LSB: Least significant bit
LSB: Least significant byte
LVDS: Low-voltage differential signaling
MAC: Media Access Control
MAC_PDU: Media Access Control protocol data unit
MAN: Metropolitan area network
MAP: Manufacturing automation protocol
Mbps: Megabits per second
MDA: Media dependent adapter
MDM: Multiservice data manager
MF: Multifrequency
MG: Media gateway
MGCP: Media Gateway Control Protocol

MIB: Management information base
MIPPS: Micro integrated project planning system
MIS: Management information system
MLT: Multilink trunk
MM: Multiple mode
MOP: Maintenance-Oriented Protocol
MP: Media proxy
MP: Multipoint procession
MPEG: Motion Picture Experts Group
MPLS: Multi-protocol label switching
ms: Milliseconds
MST: Multiple spanning tree
MSTI: Multiple spanning tree instance
MSTP: Multiple Spanning Tree Protocol
MTBF: Mean time between failures
MTP: Message Transfer Protocol
MTU: Maximum transmission unit
NAT: Network Address Translation
NBP: Name Binding Protocol
NCC: Network control center
NCFI: Non-canonical format indicator
NCP: NetWare Core Protocol
NCS: Network call signaling
NE: Network element
NetBEUI: NetBIOS Extended User Interface
NetBIOS: Network Basic Input/Output System
NFS: Network File System
NGRB: Networking Guru Rich Bramante
NIC: Network interface controller
NMI: Network management interface
NOC: Network operations center
NOS: Network operating system
NSAP: Network service access point

ns: Nanoseconds

NTP: Network Time Protocol

OC-3: Optical carrier level 3

OC-12: Optical carrier level 12

OC-48: Optical carrier level 48

OC-192: Optical carrier level 192

opcode: Operation code

OS: Operating system

OSI: Open Systems Interconnect

OSPF: Open shortest path first

OUI: Organizationally unique identifier

PAgP: Port Aggregation Protocol

PAN: Personal area network

PAR: Positive acknowledgment and retransmission

PAR: Project authorization request

PATRICIA: Practical Algorithm to Retrieve Information Coded in Alphanumeric

PBN: Packet-based network

PC: Personal computer

PCB: Printed circuit board

PCI: Peripheral component interconnect

PCM: Pulse code modulation

PCR: Peak cell rate

PDU: Protocol data unit

PHB: Per-hop behavior

PHY: Physical layer interface

PID: Protocol identifier

PL_PDU: Physical layer protocol data unit

PNNI: Private network to network interface

POP: Point of presence

POP: Post Office Protocol

POS: Packet over SONET

PPP: Point-to-Point Protocol

PRI: Primary rate interface
ps: Picoseconds
PSTN: Public switched telephone network
PVC: Permanent virtual circuit
PVID: Port VLAN identifier
QoS: Quality of service
RAM: Random access memory
RARP: Reverse Address Resolution Protocol
RAS: Remote access server
RBGoN: Rich Bramante, Guru of Networking
RDRAM: Rambus Dynamic Random Access Memory
RED: Random early discard
RED: Random early detect
RFC: Request for Comments
RII: Routing information indicator
RIP: Routing Information Protocol
RISC: Reduced instruction-set computer
RMON: Remote monitor
ROM: Read-only memory
RPSU: Redundant power supply unit
RSTP: Rapid Spanning Tree Protocol
RSVP: Resource Reservation Protocol
RT: Routing type
RTCP: Real-Time Control Protocol
RTP: Real-Time Transport Protocol
RTTP: Real-Time Transport Protocol
RTMP: Routing Table Maintenance Protocol
SA: Source address
SAP: Service access point
SAP: Service Advertisement Protocol
SD: Start delimiter
SDH: Synchronous digital hierarchy
SDU: Service data unit

SFD: Start-of-frame delimiter

SG: Signaling gateway

SGMP: Simple Gateway Management Protocol

SGRAM: Synchronous graphic random access memory

SIP: Session Initiation Protocol

SM: Single mode

SMDS: Switched multimegabit data service

SMT: Station management

SMTP: Simple Mail Transport Protocol

SNA: Systems network architecture

SNAP: Sub-Network Access Protocol

SNMP: Simple Network Management Protocol

SNMPv2: Simple Network Management Protocol version 2

SNMPv3: Simple Network Management Protocol version 3

SOHO: Small office/home office

SONET: Synchronous Optical Network

SPF: Single point of failure

SPVC: Soft permanent virtual circuit

SPX: Sequenced Packet eXchange

SR-TB: Source routing-to-transparent bridge

SRAM: Static random access memory

SRB: Source routing bridge

SRF: Specifically routed frame

SRF: Source routed frame

SRT: Source route/transparent bridge

SSAP: Source service access point

SSE: Silicon switching engine

SSRAM: Synchronous static random access memory

STE: Spanning tree explorer

STP: Spanning Tree Protocol

STUN: Simple traversal of UDP over NAT

SVC: Switched virtual circuit

SVL: Shared VLAN learning

SVoIP: Switched Voice over IP
TAG: Technical Action Group
TB: Transparent bridge
Tbps: Terabits per second
TC: Topology change
TCI: Tag control information
TCP: Transmission Control Protocol
TDM: Time division multiplexing
Telnet: Telecommunication network
TFTP: Trivial FTP
TIA: Telecommunications Industries Association
TLV: Type-length-value
TOS: Type of service
TP-4: Transport Protocol Class 4
TP-PMD: Twisted-pair physical medium dependent sublayer
TREN: Token Ring encapsulation
TSAP: Transport layer service access point
TTL: Time to live
TXI: Transmit immediate
UDP: User Datagram Protocol
UI: User interface
UNI: User to network interface
UPS: Uninterruptible power supply
UTP: Unshielded twisted pair
UUI: User-to-user interface
VAX: Virtual address extensions
VBR: Variable bit rate
VC: Virtual channel
VLAN: Virtual local area network
VMS: Virtual memory system
VoATM: Voice over ATM
VoIP: Voice over IP
VoP: Voice over Packet

VPID: VLAN protocol identifier

VPN: Virtual private network

VRRP: Virtual Router Redundancy Protocol

WAN: Wide area network

WDM: Wavelength-division multiplexer

WFQ: Weighted fair queuing

WG: Working group

XIJI: Extended LAN interface interconnect

XNS: Xerox Network System

XTP: Express Transport Protocol

ZIP: Zone Information Protocol