GLOSSARY

A

AAA authentication, authorization, and accounting (pronounced “triple a”).

AAL5 ATM adaptation layer. This layer maps higher layer user data into ATM cells, making the data suitable for transport through the ATM network.

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.

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

ADSL Asymmetric digital subscriber line. A digital subscriber line (DSL) technology in which the transmission of data from server to client is much faster than the transmission from the client to the server.

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

authentication A security feature that allows access to information to be granted on an individual basis.

B

bandwidth The range of frequencies a transmission line or channel can carry. The greater the bandwidth, the greater the information-carrying capacity of a channel. For a digital channel this is defined in bits. For an analog channel it is dependent on the type and method of modulation used to encode the data.

BBA Broadband Aggregation.

BGP Border Gateway Protocol. Interdomain routing protocol that exchanges reachability information with other BGP systems. It is defined in RFC 1163.

bps Bits per second. A standard measurement of digital transmission speeds.

bridge A device that connects two or more physical networks and forwards packets between them. Bridges can usually be made to filter packets, that is, to forward only certain traffic.

broadband Characteristic of any network that multiplexes independent network carriers onto a single cable. This is usually done using frequency division multiplexing (FDM). Broadband technology allows several networks to co-exist on one single cable; traffic from one network does not interfere with traffic from another because the "conversations" happen on different frequencies in the "ether" rather like the commercial radio system.

Broadband Remote Access Server Device that terminates remote users at the corporate network or Internet users at the Internet service provider (ISP) network, that provides firewall, authentication, and routing services for remote users.

broadcast A packet delivery system where a copy of a given packet is given to all hosts attached to the network. For example: Ethernet.

C

CAR Committed access rate.

CBOS Cisco Broadband Operating System. The common operating system for DSL CPE, including the Cisco 675, Cisco 675e, Cisco 676, and Cisco 677.

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.

CBWFQ Class-based WFQ. Extends the standard WFQ functionality to provide support for user-defined traffic classes. For CBWFQ, you define traffic classes based on match criteria including protocols, access control lists (ACLs), and input interfaces. Packets satisfying the match criteria for a class constitute the traffic for that class. A queue is reserved for each class and traffic belonging to a class is directed to the queue for that class. On the Cisco 10000 series router, the CBWFQ feature allows a VAI to inherit the service policy of the VC that the VAI uses.

CEF Cisco Express Forwarding. An advanced Layer 3 IP switching technology. CEF optimizes network performance and scalability for networks with large and dynamic traffic patterns such as the Internet, on networks characterized by intensive Web-based applications, or interactive sessions.

CE router Customer edge router. A router that is part of a customer network and that interfaces to a provider edge (PE) router. CE routers are not aware of associated VPNs.

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

CIR Committed information rate. The reserved bandwidth for the queue. The rate at which a Frame Relay network agrees to transfer information under normal conditions, averaged over a minimum increment of time. CIR, measured in bits per second, is one of the key negotiated tariff metrics.

class-based WFQ See CBWFQ.

CoS Class of service. The three most significant bits (the User Priority bits) of the 2-byte Tag Control Information field in the IEEE 802.1p portion of a Layer 2 IEEE 802.1Q frame header. QoS uses the User Priority bits for Layer 2 CoS information. IEEE 802.1p class of service-based packet matching and marking feature enables the Cisco 10000 series router to interoperate with switches to deliver end-to-end QoS. The IEEE 802.1p standard allows QoS to classify inbound Ethernet packets based on the value in the CoS field and to explicitly set the value in the CoS field of outbound packets.

CPE Customer premises equipment. Refers to equipment located in a user's premises.

D

DBS Dynamic Bandwidth Selection. DBS dynamically changes ATM traffic shaping parameters based on a subscriber's RADIUS profile. Using this feature, wholesale service providers can sell different levels of service to retail service providers, based on the bandwidth of the ATM VC connection. The retail service provider can then offer subscribers the ability to choose services with varying levels of bandwidth allocation.

DF bit Don't Fragment indicator bit. A bit in an encapsulated header that indicates whether a router is allowed to fragment a packet.

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

Dialed Number Identification Service See DNIS.

DNIS Dialed Number Identification Service. The called party number. Typically, this is a number used by call centers or a central office where different numbers are each assigned to a specific service.

DNS Domain Name Server. The part of the distributed database system for resolving a fully qualified domain name into the four-part IP number used to route communications across the Internet.

downstream rate The line rate for return messages or data transfers from the network machine to the user's customer premises machine.

DSCP Differentiated Services Code Point

DSL Digital Subscriber Line.

DSLAM Digital Subscriber Line Access Multiplexer. Concentrates and multiplexes signals at the telephone service provider location to the broader wide area network.

Dynamic Bandwidth Selection See DBS.

E

eiBGP External and Internal Border Gateway Protocol.

encapsulation The technique used by layered protocols in which a layer adds header information to the protocol data unit (PDU) from the layer above.

Ethernet One of the most common local area network (LAN) wiring schemes, Ethernet has a transmission rate of 10, 100, or 1000 Mbps.

F

Fast switching Cisco feature whereby a route cache is used to expedite packet switching through a router.

FCC Federal Communications Commission. A U.S. government agency that regulates interstate and foreign communications. The FCC sets rates for communication services.

FTP File Transfer Protocol. The Internet protocol used to transfer files between hosts.

G

GE Gigabit Ethernet.

GRE Generic Route Encapsulation. A method of encapsulating any network protocol in another protocol.

H

high VC count Also called high VC mode. A technique used to optimize processes for session scaling.

HGW Home Gateway. Also known as L2TP Network Server (LNS) in L2TP contexts.

hop count A measure of distance between two points on the Internet. It is equivalent to the number of gateways that separate the source and destination.

HTML Hypertext Markup Language. The page-coding language for the World Wide Web.

http Hypertext Transfer Protocol. The protocol used to carry world-wide web (www) traffic between a www browser computer and the www server being accessed.

I

ICMP Internet Control Message Protocol. The protocol used to handle errors and control messages at the IP layer. ICMP is actually part of the IP protocol.

IETF Internet Engineering Task Force. Task force consisting of over 80 working groups responsible for developing Internet standards.

IGMP Internet Group Management Protocol. Used by IP hosts to report their multicast group memberships to an adjacent multicast router.

Internet A collection of networks interconnected by a set of routers that allow them to function as a single, large virtual network.

Internet Protocol (IP) The network layer protocol for the Internet protocol suite.

IRB Integrated routing and bridging. A protocol that allows a router to act as both bridge and router on the same interface. For broadband aggregation, we recommend using the routed bridge encapsulation (RBE) protocol. See RBE.

IP See Internet Protocol.

ISO International Standards Organization. A voluntary, non-treaty organization founded in 1946, responsible for creating international standards in many areas, including computers and communications.

ISP Internet service provider. A company that allows home and corporate users to connect to the Internet.

ITU-T International Telecommunications Union, Standardization Sector. ITU-T is the telecommunication standardization sector of ITU and is responsible for making technical recommendations about telephone and data (including fax) communications systems for service providers and suppliers.

L

L2F Layer 2 Forwarding. Protocol that supports the creation of secure virtual private dial-up networks over the Internet.

L2TP Layer 2 Tunnel Protocol. An Internet Engineering Task Force (IETF) standards track protocol defined in RFC 2661 that provides tunneling of PPP. Based upon the best features of L2F and PPTP, L2TP provides an industry-wide interoperable method of implementing VPDN.

LAC L2TP access concentrator. A node that acts as one side of an L2TP tunnel endpoint and is a peer to the L2TP network server (LNS). The LAC sits between an LNS and a remote system and forwards packets to and from each. Packets sent from the LAC to the LNS requires tunneling with the L2TP protocol as defined in this document. The connection from the LAC to the remote system is either local or a PPP link.

LAN Local area network. A limited distance (typically under a few kilometers or a couple of miles) high-speed network (typically 4 to 100 Mbps) that supports many computers.

LCP Link control protocol. Protocol that establishes, configures, and tests data-link connections for use by PPP.

LNS L2TP network server. A node that acts as one side of an L2TP tunnel endpoint and is a peer to the L2TP access concentrator (LAC). The LNS is the logical termination point of a PPP session that is being tunneled from the remote system by the LAC. Analogous to the Layer 2 Forwarding (L2F) home gateway (HGW).

local address pools Locally configured pools of IP addresses that the virtual home gateway (VHG) or PE router uses to assign addresses to the remote users of the PPP sessions it terminates.

M

MAC Media Access Control Layer. A sublayer of the Data Link Layer (Layer 2) of the ISO OSI Model responsible for media control.

MIB Management Information Base. Database of network management information that is used and maintained by a network management protocol, such as SNMP or CMIP (Common Management Information Protocol). The value of a MIB object can be changed or retrieved using SNMP commands, usually through a Network Management System (NMS). MIB objects are organized in a tree structure that includes public (standard) and private (proprietary) branches.

Modular QoS Command-line interface See MQC.

MPLS Multiprotocol Label Switching. Switching method that forwards IP traffic using a label. This label instructs the routers and the switches in the network where to forward the packets based on preestablished IP routing information.

MPLS VPN MPLS-based virtual private network.

MQC Modular QoS Command-line interface. Also referred to as Modular CLI. A platform independent CLI for configuring QoS features on Cisco products.

MR-APS Multirouter automatic protection switching.

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.

multihop A term used in Cisco VPN environments. Refers to accepting a PPP session from L2TP, PPTP, or L2F and tunneling it back out using L2TP, PPTP, or L2F. See also tunnel switch.

multipoint subinterface Multipoint networks have three or more routers in the same subnet. For Dynamic Bandwidth Selection, if you put the PVC in a point-to-multipoint subinterface or in the main interface (which is multipoint by default), you need to either configure a static mapping or enable inverse Address Resolution Protocol (ARP) for dynamic mapping.

multiplexer A device that can send several signals over a single line. The signals are then separated by a similar device at the other end of the link. This can be done in a variety of ways: time division multiplexing, frequency division multiplexing, and statistical multiplexing. Multiplexers are also becoming increasingly efficient in terms of data compression, error correction, transmission speed, and multi-drop capabilities.

N

NAS Network access server. Cisco platform (or collection of platforms) that interfaces between the packet world (for example, the Internet) and the circuit world (for example, PSTN).

NetFlow A Cisco-proprietary IP statistics collection feature that collects information on IP flows passing through a router.

NVRAM Non-Volatile Random Access Memory. The router uses this memory to store configuration information. The contents of this memory are not lost after a reboot or power cycle of the unit.

O

OAP Overlapping Address Pool. An IP address group that supports multiple IP address spaces and still allows for the verification of nonoverlapping IP address pools within a pool group.

ODAP A block of addresses managed by a central server such as a Radius server or DHCP server. Each pool is divided into subnets of various sizes. The server assigns the subnets to PE routers upon request.

on-demand address pool See ODAP.

OSI Open Systems Interconnection. An international standardization program to facilitate communications among computers from different manufacturers.

overlapping address pool See OAP.

P

PAP Password Authentication Protocol. Authentication protocol that allows PPP peers to authenticate one another. The remote router attempting to connect to the local router is required to send an authentication request. Unlike CHAP, PAP passes the password and host name or user name in the clear (unencrypted). PAP does not itself prevent unauthorized access, but merely identifies the remote end. The router or access server then determines if that user is allowed access. PAP is supported only on PPP lines. Compare with CHAP.

PCR Peak cell rate. Parameter defined by the ATM Forum for ATM traffic management.

permanent virtual circuit A fixed virtual circuit between two users. The public data network equivalent of a leased line. No call setup or clearing procedures are needed.

PE router Provider edge router. A router that is part of a service provider's network connected to a customer edge (CE) router. All VPN processing occurs in the PE router.

point-to-point subinterface With point-to-point subinterfaces, each pair of routers has its own subnet. If you put the PVC on a point-to-point subinterface, the router assumes that there is only one point-to-point PVC configured on the subinterface. Therefore, any IP packets with a destination IP address in the same subnet are forwarded on this VC. This is the simplest way to configure the mapping and is, therefore, the recommended method.

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

PPPoA PPP over ATM. Enables a high-capacity central site router with an Asynchronous Transfer Mode (ATM) interface to terminate multiple remote PPP connections.

PPPoE PPP over Ethernet. Allows a PPP session to be initiated on a simple bridging Ethernet connected client. Refers to a signaling protocol defined within PPPoE as well as the encapsulation method. See also RFC 2516.

PPPoEoA PPP over Ethernet over ATM. Allows tunneling and termination of PPP sessions over Ethernet links and allows for Ethernet PPP connections over ATM links.

PPPoEoE PPP over Ethernet over on Ethernet. Allows tunneling and termination of PPP sessions over Ethernet links and allows for Ethernet PPP connections over Ethernet links.

PPPoEo802.1Q VLAN PPP over Ethernet over IEEE 802.1Q VLANs. Allows tunneling and termination of Ethernet PPP sessions across VLAN links. IEEE 802.1Q encapsulation is used to interconnect a VLAN-capable router with another VLAN-capable networking device. The packets on the 802.1Q link contain a standard Ethernet frame and the VLAN information associated with that frame.

PPPoX PPP over PPPoA or PPPoE or both.

PQ Priority Queuing.

PTA PPP termination aggregation. A method of aggregating IP traffic by terminating PPP sessions and aggregating the IP traffic into a single routing domain.

PTA-MD PTA Multi-Domain. A method of aggregating IP traffic by terminating PPP sessions and aggregating the IP traffic into a VPN or multiple IP routing domains.

PVC Permanent virtual circuit or connection. Virtual circuit that is permanently established. PVCs save bandwidth associated with circuit establishment and tear down in situations where certain virtual circuits must exist all the time. In ATM terminology, called a permanent virtual connection. Compare with SVC. See also virtual circuit (VC).

PVP Permanent virtual path. Virtual path that consists of PVCs.

PXF Parallel Express Forwarding. Also referred to as *fast forwarder.* A pipelined, multiprocessor parallel packet engine, optimized for fast packet forwarding.

Q

QoS Quality of service. Cisco IOS QoS technology lets complex networks control and predictably service a variety of networked applications and traffic types.

R

RADIUS Remote Authentication Dial-In User Service (RADIUS). A client/server security protocol created by Livingston Enterprises. Security information is stored in a central location, known as the RADIUS server.

RADIUS accounting client Permits system administrators to track dial-in use.

RADIUS security client Controls access to specific services on the network.

RBE Routed bridge encapsulation. The process by which a stub-bridged segment is terminated on a point-to-point routed interface. Specifically, the router is routing on an IEEE 802.3 or Ethernet header carried over a point-to-point protocol such as PPP, RFC 1483 ATM, or RFC 1490 Frame Relay.

RD Route distinguisher. An 8-byte value that is concatenated with an IPv4 prefix to create a unique VPN IPv4 prefix.

RIP Routing Information Protocol. An IGP used to exchange routing information within an autonomous system, RIP uses hop count as a routing metric.

route The path that network traffic takes from its source to its destination. The route a datagram follows can include many gateways and many physical networks. In the Internet, each datagram is routed separately.

router A system responsible for making decisions about which of several paths network (or Internet) traffic will follow. To do this, it uses a routing protocol to gain information about the network and algorithms to choose the best route based on several criteria known as “routing metrics.”

routing table Information stored within a router that contains network path and status information. It is used to select the most appropriate route to forward information along.

S

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.

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, typically through the use of a network management system.

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.

T

ToS Type of service. First defined in RFC 791.

trap Message sent by an SNMP agent to a network management station, console, or terminal to indicate the occurrence of a significant event, such as a specifically defined condition or a threshold that was reached.

tunnel A virtual pipe between the LAC and LNS that can carry multiple L2TP sessions.

tunnel switch A term used in DSL environments. Refers to a device that accepts a PPP session from L2TP, PPTP, or L2F and tunnels it again using L2TP, PPTP, or L2F. See also multihop.

turbo access control list A function of the PXF pipeline that determines whether a packet matches a list in a fixed, predictable period of time, usually regardless of the number of entries in a list. Turbo ACLs enable more expedient packet classification and access checks when the router is evaluating ACLs. The Turbo ACL feature compiles the ACLs into a set of lookup tables, while maintaining the first match requirements. Packet headers are used to access these tables in a small, fixed number of lookups, independently of the existing number of ACL entries.

U

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 not guarantees in terms of cell loss rate and delay.

UNI signaling User Network Interface signaling for ATM communications.

upstream rate The line rate for message or data transfer from the source machine to a destination machine on the network.

V

VAI Virtual Access Interface.

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. See also VBR-nrt and VBR-rt.

VBR-nrt Variable Bit Rate-non-real time. QoS class defined by the ATM Forum for ATM networks. VBR-nrt is used for connections in which there is no fixed timing relationship between samples, but that still need a guaranteed QoS.

VBR-rt Variable Bit Rate-real time. QoS class defined by the ATM Forum for ATM networks. VBR-rt is used for connections in which there is a fixed timing relationship between samples.

VC Virtual Circuit. Also referred to as Virtual Channel. Used in ATM applications. A link that seems and behaves like a dedicated point-to-point line or a system that delivers packets in sequence, as happens on an actual point-to-point network. In reality, the data is delivered across a network via the most appropriate route. The sending and receiving devices do not have to be aware of the options and the route is chosen only when a message is sent. There is no pre-arrangement, so each virtual circuit exists only for the duration of that one transmission.

VCI Virtual channel identifier. A 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 transmit on its way to its final destination. The function of the VCI is similar to that of the DLCI in Frame Relay.

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.

VPDN Virtual Private Dialup Network. A system that permits dial-in networks to exist remotely to home networks, while giving the appearance of being directly connected. VPDNs use L2TP and L2F to terminate the Layer 2 and higher parts of the network connection at the home gateway.

VPI Virtual path identifier. An 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 transmit on its way to its final destination. The function of the VPI is similar to that of the DLCI in Frame Relay.

VPN Virtual private network. A secure IP-based network that shares resources on one or more physical networks. A VPN contains geographically dispersed sites that can communicate securely over a shared backbone. VPNs enable IP traffic to travel securely over a public TCP/IP network by encrypting all traffic from one network to another. A VPN uses “tunneling” to encrypt all information at the IP level.

vpnv4 Used as a keyword in commands to indicate VPN-IPv4 prefixes. These prefixes are customer VPN addresses, each of which has been made unique by the addition of an 8-byte route distinguisher.

VRF Virtual routing and forwarding instance. A VRF consists of an IP routing table, a derived forwarding table, a set of interfaces that use the forwarding table, and a set of rules and routing protocols that determine what goes into the forwarding table. In general, a VRF includes the routing information that defines a customer VPN site that is attached to a PE router.

VSA Vendor-Specific Attribute. An attribute that has been implemented by a particular vendor. It uses the attribute Vendor-Specific to encapsulate the resulting AV pair: essentially, Vendor-Specific = protocol:attribute = value.

W

WAN Wide area network. A data communications network that spans any distance and is usually provided by a public carrier (such as a telephone company or service provider).

WFQ Weighted Fair Queuing. A QoS congestion management function.

WRED Weighted Random Early Detection. A QoS congestion avoidance function.

X

xDSL Various types of digital subscriber lines. Examples include ADSL, HDLS, and VDSL.