GLOSSARY

6in4 One of the most popular of all the IPv6 tunneling standards, and one of only two IPv6 tunneling protocols that can go through a NAT.

6to4 The dominant IPv6 tunneling protocol because it is the only IPv6 tunnel that doesn't require a tunnel broker. It is usually used to directly connect two routers because it normally requires a public IPv4 address.

10BaseFL Fiber-optic implementation of Ethernet that runs at 10 megabits per second (Mbps) using baseband signaling. Maximum segment length is 2 km.

10BaseT An Ethernet LAN designed to run on UTP cabling. Runs at 10 Mbps and uses baseband signaling. Maximum length for the cabling between the NIC and the hub (or the switch, the repeater, and so forth) is 100 m.

10GBaseER/10GBaseEW A 10-GbE standard using 1550-nm single-mode fiber. Maximum cable length up to 40 km.

10GBaseLR/10GBaseLW A 10-GbE standard using 1310-nm single-mode fiber. Maximum cable length up to 10 km.

10GBaseSR/10GBaseSW A 10-GbE standard using 850-nm multimode fiber. Maximum cable length up to 300 m.

10GBaseT A 10-GbE standard designed to run on CAT 6a UTP cabling. Maximum cable length of 100 m.

10-Gigabit Ethernet (10 GbE) Currently (2009) the fastest Ethernet designation available, with a number of fiber-optic and copper standards.

100BaseFX An Ethernet LAN designed to run on fiber-optic cabling. Runs at 100 Mbps and uses baseband signaling. Maximum cable length is 400 m for half duplex, and 2 km for full duplex.

100BaseT An Ethernet LAN designed to run on UTP cabling. Runs at 100 Mbps, uses baseband signaling, and uses two pairs of wires on CAT 5 or better cabling.

100BaseT4 An Ethernet LAN designed to run on UTP cabling. Runs at 100 Mbps and uses four-pair CAT 3 or better cabling. Made obsolete by 100BaseT.

100BaseTX The technically accurate but little-used name for 100BaseT.

110-Punchdown Block The most common connection used on the back of an RJ-45 jack and patch panels.

110-Punchdown Tool *See* Punchdown Tool.

802 Committee The IEEE committee responsible for all Ethernet standards.

802.1X A port-authentication network access control mechanism for networks.

802.3 Ethernet *See* Ethernet.

802.3ab The IEEE standard for 1000BaseT.

802.3z The umbrella IEEE standard for all versions of Gigabit Ethernet other than 1000BaseT.

802.11 *See* IEEE 802.11.

802.11a A wireless standard that operates in the frequency range of 5 GHz and offers throughput of up to 54 Mbps.

802.11b The first popular wireless standard, operates in the frequency range of 2.4 GHz and offers throughput of up to 11 Mbps.

802.11g The most recent wireless standard, operates in the frequency range of 2.4 GHz and, optionally, 5 GHz, offering throughput of up to 400 Mbps.

802.11i A wireless standard that added security features.

802.11n An updated 802.11 standard that increases transfer speeds and adds support for multiple in/multiple out (MIMO) by using multiple antennae.

802.16 An updated wireless standard (also known as WiMax) with a range of up to 30 miles.

1000BaseCX A Gigabit Ethernet standard using unique copper cabling. 25-m maximum cable distance.

1000BaseLX A Gigabit Ethernet standard using single-mode fiber cabling. 220 to 500-m maximum cable distance.

1000BaseSX A Gigabit Ethernet standard using multimode fiber cabling. 5-km maximum cable distance.

1000BaseT A Gigabit Ethernet standard using CAT 5e/6 UTP cabling. 100-m maximum cable distance.

1000BaseX An umbrella Gigabit Ethernet standard. Also known as 802.3z. Comprises all Gigabit standards with the exception of 1000BaseT, which is under the 802.3ab standard.

A Records A list of the IP addresses and names of all the systems on a DNS server domain.

AAA (Authentication, Authorization, and Accounting) *See* Authentication, Authorization, and Accounting (AAA).

Acceptable Use Policy A document that defines what a person may and may not do on an organization's computers and networks.

Access Control List (ACL) A clearly defined list of permissions that specifies what an authenticated user may perform on a shared resource.

Active Directory A form of directory service used in networks with Windows servers. Creates an organization of related computers that share one or more Windows domains.

Activity Light An LED on a NIC, hub, or switch that blinks rapidly to show data transfers over the network.

Ad Hoc *See* Ad Hoc Mode.

Ad Hoc Mode Each wireless node is in direct contact with every other node in a decentralized free-for-all. Ad-hoc mode is similar to the *mesh topology*.

Address Resolution Protocol (ARP) A protocol in the TCP/IP suite used with the command-line utility of the same name to determine the MAC address that corresponds to a particular IP address.

ADSL (Asymmetric Digital Subscriber Line) *See* Asymmetric Digital Subscriber Line (ADSL).

Advanced Encryption Standard (AES) A block cipher created in the late 1990s that uses a 128-bit block size and a 128-, 192-, or 256-bit key size. Practically uncrackable.

Adware A program that monitors the types of Web site you frequent and uses that information to generate targeted advertisements, usually pop-up windows.

Aggregation A router hierarchy in which every router underneath a router always uses a subnet of that router's existing routes.

Algorithm A set of rules for solving a problem in a given number of steps.

Anycast A method of addressing groups of computers as though they were a single computer. Anycasting starts by giving a number of computers (or clusters of computers) the same IP address. Advanced routers then send incoming packets to the closest of the computers.

Apache HTTP Server An open-source HTTP server program that runs on a wide variety of operating systems.

Application Layer *See* OSI Seven-Layer Model.

Application Log Tracks application events, such as when an application opens or closes. Different types of application logs record different events.

Archive Bit An attribute of a file that shows whether the file has been backed up since the last change. Each time a file is opened, changed, or saved, the archive bit is turned on. Some types of backups turn off this archive bit to indicate that a good backup of the file exists on tape.

Area ID Address assigned to routers in an OSPF network to prevent flooding beyond the routers in that particular network. *See also* OSPF (Open Shortest Path First).

ARP PING A PING command that uses the ARP command instead of ICMP. ARP PING won't cross any routers, so it will only work within a broadcast domain.

Asymmetric Digital Subscriber Line (ADSL) A fully digital, dedicated connection to the telephone system that provides download speeds of up to 9 Mbps and upload speeds of up to 1 Mbps.

Asymmetric-Key Algorithm An encryption method in which the key used to encrypt a message and the key used to decrypt it are different, or asymmetrical.

Asynchronous Transfer Mode (ATM) A network technology that runs at speeds between 25 and 622 Mbps using fiber-optic cabling or CAT 5 or better UTP.

ATM (Asynchronous Transfer Mode) *See* Asynchronous Transfer Mode (ATM).

Attenuation The degradation of signal over distance for a networking cable.

Authentication A process that proves good data traffic truly came from where it says it originated by verifying the sending and receiving users and computers.

Authentication, Authorization, and Accounting (AAA) A security philosophy wherein a computer trying to connect to a network must first present some form of credential in order to be authenticated, and then must have limitable permissions within the network. The authenticating server should also record session information about the client.

Authentication Server (AS) In Kerberos, a system that hands out Ticket-Granting Tickets to clients after comparing the client hash to its own. *See also* Ticket-Granting Ticket (TGT).

Authoritative DNS Servers DNS servers that hold the IP addresses and names of systems for a particular domain or domains in special storage areas called *forward lookup zones*.

Authorization A step in the AAA philosophy during which a client's permissions are decided upon.

Automatic Private IP Addressing (APIPA) A networking feature of operating systems that enables DHCP clients to self-configure an IP address and subnet mask automatically when a DHCP server isn't available.

Autonomous System (AS) One or more networks that are governed by a single protocol within that AS.

Back Up To save important data in a secondary location as a safety precaution against the loss of the primary data.

Backup Designated Router A second router set to take over if the designated router fails. *See also* Designated Router.

Backup Generator An onsite generator that provides electricity if the power utility fails.

Bandwidth A piece of the spectrum occupied by some form of signal, whether it is television, voice, fax data, and so forth. Signals require a certain size and location of bandwidth to be transmitted. The higher the bandwidth, the faster the signal transmission, thus allowing for a more complex signal such as audio or video. Because bandwidth is a limited space, when one user is occupying it, others must wait their turn. Bandwidth is also the capacity of a network to transmit a given amount of data during a given period.

Baseband Digital signaling that has only one signal (a single signal) on the cable at a time. The signals must be in one of three states: one, zero, or idle.

Baseline Static image of a system's (or network's) performance when all elements are known to be working properly.

Basic Rate Interface (BRI) The basic ISDN configuration, which consists of two *B* channels (which can carry voice or data at a rate of 64 Kbps) and one *D* channel (which carries setup and configuration information, as well as data, at 16 Kbps).

Basic Service Set (BSS) In wireless networking, a single access point servicing a given area.

Basic Service Set Identifier (BSSID) Naming scheme in wireless networks.

Baud One analog cycle on a telephone line.

Baud Rate The number of bauds per second. In the early days of telephone data transmission, the baud rate was often analogous to bits per second. Due to advanced modulation of baud cycles as well as data compression, this is no longer true.

Bearer Channel (B Channel) A type of ISDN channel that carries data and voice information using standard DS0 channels at 64 Kbps.

Biometric Devices Scan fingerprints, retinas, or even the sound of the user's voice to provide a fool-proof replacement for both passwords and smart devices.

Bit Error Rate Test (BERT) An end-to-end test that verifies a T-carrier connection.

Block Cipher An encryption algorithm in which data is encrypted in "chunks" of a certain length at a time. Popular in wired networks.

BNC Connector A connector used for 10Base2 coaxial cable. All BNC connectors have to be locked into place by turning the locking ring 90 degrees.

Bonding Two or more NICs in a system working together to act as a single NIC to increase performance.

BOOTP (Bootstrap Protocol) A component of TCP/IP that allows computers to discover and receive an IP address from a DHCP server prior to booting the OS. Other items that may be discovered during the BOOTP process are the IP address of the default gateway for the subnet and the IP addresses of any name servers.

Border Gateway Protocol (BGP-4) An exterior gateway routing protocol that enables groups of routers to share routing information so that efficient, loop-free routes can be established.

Botnet A group of computers under the control of one operator, used for malicious purposes.

Bps (Bits Per Second) A measurement of how fast data is moved across a transmission medium. A Gigabit Ethernet connection moves 1,000,000,000 bps.

Bridge A device that connects two networks and passes traffic between them based only on the node address, so that traffic between nodes on one network does not appear on the other network. For example, an Ethernet bridge only looks at the MAC address. Bridges filter and forward packets based on MAC addresses and operate at Level 2 (Data Link layer) of the OSI seven-layer model.

Bridge Loop A negative situation in which bridging devices (usually switches) are installed in a loop configuration, causing packets to loop continuously. Switches using Shortest Path First (SPF) protocol prevent bridge loops by automatically turning off looping ports.

Bridged Connection An early type of DSL connection that made the DSL line the same as if you snapped an Ethernet cable into your NIC.

Broadband Analog signaling that sends multiple signals over the cable at the same time. The best example of broadband signaling is cable television. The zero, one, and idle states (*see* Baseband) exist on multiple channels on the same cable.

Broadcast A packet addressed to all machines, almost always limited to a broadcast domain.

Broadcast Address The address a NIC attaches to a frame when it wants every other NIC on the network to read it. In TCP/IP, the general broadcast address is 255.255.255.255. In Ethernet, the broadcast MAC address is FF-FF-FF-FF-FF-FF.

Broadcast Domain A network of computers that will hear each other's broadcasts. The older term *collision domain* is the same but rarely used today.

Browser A software program specifically designed to retrieve, interpret, and display Web pages.

Building Entrance Location where all the cables from the outside world (telephone lines, cables from other buildings, and so on) come into a building.

Bus Topology A network topology that uses a single bus cable that connects all of the computers in line. Bus topology networks must be terminated.

Butt Set Device that can tap into a 66- or 110-punchdown block to see if a particular line is working.

Byte Eight contiguous bits, the fundamental data unit of personal computers. Storing the equivalent of one character, the byte is also the basic unit of measurement for computer storage. Bytes are counted in powers of two.

CAB Files Short for "cabinet files." These files are compressed and most commonly used during Microsoft operating system installation to store many smaller files, such as device drivers.

Cable Certifier A very powerful cable testing device used by professional installers to test the electrical characteristics of a cable and then generate a certification report, proving that cable runs pass EIA/TIA standards.

Cable Drop Location where the cable comes out of the wall at the workstation location.

Cable Modem A bridge device that interconnects the cable company's DOCSIS service to the user's Ethernet network. In most locations, the cable modem is the demarc.

Cable Stripper Device that enables the creation of UTP cables.

Cable Tester A generic name for a device that tests cables. Some common tests are continuity, electrical shorts, crossed wires, or other electrical characteristics.

Cable Tray A device for organizing cable runs in a drop ceiling.

Cache A special area of RAM that stores frequently accessed data. In a network there are a number of applications that take advantage of cache in some way.

Cache-Only DNS Servers (Caching-Only DNS Servers) DNS servers that do not have any forward lookup zones. They resolve names of systems on the Internet for the network, but are not responsible for telling other DNS servers the names of any clients.

Cached Lookup The list kept by a DNS server of IP addresses it has already resolved, so it won't have to re-resolve an FQDN it has already checked.

Canonical Name (CNAME) Less common type of DNS record that acts as a computer's alias.

Capturing a Printer A process by which a printer uses a local LPT port that connects to a networked printer. This is usually only done to support older programs that are not smart enough to know how to print directly to a UNC-named printer; it's quite rare today.

Card Generic term for anything that you can snap into an expansion slot.

Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA) *See* CSMA/CA.

Carrier Sense Multiple Access with Collision Detection (CSMA/CD) *See* CSMA/CD.

CAT 3 Category 3 wire, an EIA/TIA standard for UTP wiring that can operate at up to 16 Mbps.

CAT 4 Category 4 wire, an EIA/TIA standard for UTP wiring that can operate at up to 20 Mbps. This is not widely used, except in older Token Ring networks.

CAT 5 Category 5 wire, an EIA/TIA standard for UTP wiring that can operate at up to 100 Mbps.

CAT 5e Category 5e wire, an EIA/TIA standard for UTP wiring with improved support for 100 Mbps using two pairs, and support for 1000 Mbps using four pairs.

CAT 6 Category 6 wire, an EIA/TIA standard for UTP wiring with improved support for 1000 Mbps.

Category (CAT) Rating A grade assigned to cable to help network installers get the right cable for the right network technology. CAT ratings are officially rated in megahertz (MHz), indicating the highest-frequency bandwidth the cable can handle.

CCITT European standards body that established the V standards for modems.

Central Office Building that houses local exchanges and a location where individual voice circuits come together.

Certificate A public encryption key signed with the digital signature from a trusted third party called a *certificate authority (CA)*. This key serves to validate the identity of its holder when that person or company sends data to other parties.

Change Management Documentation A set of documents that defines procedures for changes to the network.

Channel A portion of the wireless spectrum on which a particular wireless network operates. Setting wireless networks to different channels enables separation of the networks.

Channel Service Unit/Digital Service Unit (CSU/DSU) *See* CSU/DSU.

CHAP (Challenge Handshake Authentication Protocol) A remote access authentication protocol. It has the serving system challenge the remote client, which must provide an encrypted password.

Chat A multiparty, real-time text conversation. The Internet's most popular version is known as Internet Relay Chat (IRC), which many groups use to converse in real time with each other.

Checksum A simple error-detection method that adds a numerical value to each data packet, based on the number of data bits in the packet. The receiving node applies the same formula to the data and verifies that the numerical value is the same; if not, the data has been corrupted and must be re-sent.

CIDR (Classless Inter-Domain Routing) Method of categorizing IP addresses in order to distribute them. *See also* Subnetting.

Cipher A series of complex and hard-to-reverse mathematics run on a string of ones and zeroes in order to make a new set of seemingly meaningless ones and zeroes.

Ciphertext The output when cleartext is run through a cipher algorithm using a key.

Circuit Switching The process for connecting two phones together on one circuit.

Cisco IOS Cisco's proprietary operating system.

Cladding The part of a fiber-optic cable that makes the light reflect down the fiber.

Class License Contiguous chunk of IP addresses passed out by the Internet Assigned Numbers Authority (IANA).

Classless Subnet A subnet that does not fall into the common categories such as Class A, Class B, and Class C.

Cleartext *See* Plaintext.

Client A computer program that uses the services of another computer program; software that extracts information from a server. Your autodial phone is a client, and the phone company is its server. Also, a machine that accesses shared resources on a server.

Client/Server A relationship in which client software obtains services from a server on behalf of a user.

Client/Server Application An application that performs some or all of its processing on an application server rather than on the client. The client usually only receives the result of the processing.

Client/Server Network A network that has dedicated server machines and client machines.

Coaxial Cable A type of cable that contains a central conductor wire surrounded by an insulating material, which in turn is surrounded by a braided metal shield. It is called coaxial because the center wire and the braided metal shield share a common axis or centerline.

Collision The result of two nodes transmitting at the same time on a multiple access network such as the Ethernet. Both packets may be lost or partial packets may result.

Collision Domain *See* Broadcast Domain.

Collision Light A light on some older NICs that flickers when a network collision is detected.

Command A request, typed from a terminal or embedded in a file, to perform an operation or to execute a particular program.

Common Internet File System (CIFS) The protocol that NetBIOS used to share folders and printers. Still very common, even on UNIX/Linux systems.

Complete Algorithm A cipher and the methods used to implement that cipher.

Concentrator A device that brings together at a common center connections to a particular kind of network (such as Ethernet), and implements that network internally.

Configuration Management A set of documents, policies, and procedures designed to help you maintain and update your network in a logical, orderly fashion.

Configuration Management Documentation Documents that define the configuration of a network. These would include wiring diagrams, network diagrams, baselines, and policy/procedure/configuration documentation.

Configurations The settings stored in devices that define how they are to operate.

Connection-Oriented Communication A protocol that establishes a connection between two hosts before transmitting data and verifies receipt before closing the connection between the hosts. TCP is an example of a connection-oriented protocol.

Connectionless Communication A protocol that does not establish and verify a connection between the hosts before sending data; it just sends the data and hopes for the best. This is faster than connection-oriented protocols. UDP is an example of a connectionless protocol.

Content Switch Advanced networking device that works at least at Layer 7 (Application layer) and hides servers behind a single IP.

Continuity The physical connection of wires in a network.

Continuity Tester Cheap network tester that can only test for continuity on a line.

Convergence Point at which the routing tables for all routers in a network are updated.

Copy Backup A type of backup similar to Normal or Full, in that all selected files on a system are backed up. This type of backup does *not* change the archive bit of the files being backed up.

Core The central glass of the fiber-optic cable that carries the light signal.

Counter A predefined event that is recorded to a log file.

CRC (Cyclic Redundancy Check) A mathematical method that is used to check for errors in long streams of transmitted data with high accuracy. Before data is sent, the main computer uses the data to calculate a CRC value from the data's contents. If the receiver calculates a different CRC value from the received data, the data was corrupted during transmission and is resent. Ethernet packets have a CRC code.

Crimper Also called a *crimping tool*, the tool used to secure a crimp (or an RJ-45 connector) onto the end of a cable.

Crossover Cable A special UTP cable used to interconnect hubs/switches or to connect network cards without a hub/switch. Crossover cables reverse the sending and receiving wire pairs from one end to the other.

Cross-Platform Support Standards created to enable terminals (and now operating systems) from different companies to interact with one another.

Crossover Port Special port in a hub that crosses the sending and receiving wires, thus removing the need for a crossover cable to connect the hubs.

Crosstalk Electrical signal interference between two cables that are in close proximity to each other.

CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance) Access method used mainly on wireless networks. Before hosts send out data, they send out a signal that checks to make sure that the network is free of other signals. If data is detected on the wire, the hosts wait a random time period before trying again. If the wire is free, the data is sent out.

CSMA/CD (Carrier Sense Multiple Access with Collision Detection) Access method that Ethernet systems use in LAN technologies, enabling packets of data to flow through the network and ultimately reach address locations. Known as a *contention* protocol, hosts on CSMA/CD networks send out data without checking to see if the wire is free first. If a collision occurs, then both hosts wait a random time period before retransmitting the data.

CSU/DSU (Channel Service Unit/Data Service Unit) A piece of equipment that connects a T-carrier leased line from the telephone company to a customer's equipment (such as a router). It performs line encoding and conditioning functions, and it often has a loopback function for testing.

Daily Backup Also called a *daily copy backup*, makes a copy of all files that have been changed on that day without changing the archive bits of those files.

Daisy-chain A method of connecting together several devices along a bus and managing the signals for each device.

Data Backup The process of creating extra copies of data to be used in case the primary data source fails.

Data Encryption Standard (DES) A symmetric-key algorithm developed by the U.S. government in the 1970s and was formerly in use in a variety of TCP/IP applications. DES used a 64-bit block and a 56-bit key. Over time, the 56-bit key made DES susceptible to brute-force attacks.

Data Link Layer *See* OSI Seven-Layer Model.

Data Over Cable Service Interface Specification (DOCSIS) The unique protocol used by cable modem networks.

Datagram Another term for *network packets* or *frames*. *See both* Packet and Frame.

Dedicated Circuit A circuit that runs from a breaker box to specific outlets.

Dedicated Line A telephone line that is an always open, or connected, circuit. Dedicated telephone lines usually do not have telephone numbers.

Dedicated Server A machine that does not use any client functions, only server functions.

Default A software function or operation that occurs automatically unless the user specifies something else.

Default Gateway In a TCP/IP network, the IP address of the router that interconnects the LAN to a wider network, usually the Internet. This router's IP address is part of the necessary TCP/IP configuration for communicating with multiple networks using IP.

Delta Channel (D Channel) A type of ISDN line that transfers data at 16 Kbps.

Demarc A device that marks the dividing line of responsibility for the functioning of a network between internal users and upstream service providers.

Demarc Extension Any cabling that runs from the network interface to whatever box is used by the customer as a demarc.

Denial of Service (DoS) Attacks Flood a networked server with so many requests that it becomes overwhelmed and ceases functioning.

Designated Router (DR) The main router in an OSPF network that relays information to all other routers in the area.

Destination NAT Type of NAT in which the destination IP addresses get translated by the router.

Destination Port A fixed, predetermined number that defines the function or session type in a TCP/IP network.

Device Driver A subprogram to control communications between the computer and some peripheral hardware.

Device ID The last six digits of a MAC address, identifying the manufacturer's unique serial number for that NIC.

DHCP (Dynamic Host Configuration Protocol) A protocol that allows a DHCP server to set TCP/IP settings automatically for a DHCP client.

DHCP Lease Created by the DHCP server to allow a system requesting DHCP IP information to use that information for a certain amount of time.

DHCP Scope The pool of IP addresses that a DHCP server may allocate to clients requesting IP addresses, or other IP information like DNS server addresses.

Dial-up Lines Telephone lines with telephone numbers; they must dial to make a connection, as opposed to a dedicated line.

Differential Backup Similar to an incremental backup in that it backs up the files that have been changed since the last backup. This type of backup does not change the state of the archive bit.

DIG (Domain Information Grouper) *See* Domain Information Grouper.

Digital Signature A string of characters, created from a private encryption key, that verifies a sender's identity to those who receive encrypted data or messages.

Digital Subscriber Line (DSL) A high-speed Internet connection technology that uses a regular telephone line for connectivity. DSL comes in several varieties, including Asymmetric (ADSL) and Symmetric (SDSL), and many speeds. Typical home-user DSL connections are ADSL with a download speed of up to 1.5 Mbps and an upload speed of up to 384 Kbps.

Dipole Antenna The standard straight-wire antenna that provides most omni-directional function.

Direct Current (DC) A type of electricity where the flow of electrons is in a complete circle.

Direct-Sequence Spread-Spectrum (DSSS) A spread-spectrum broadcasting method defined in the 802.11 standard that sends data out on different frequencies at the same time.

Discretionary Access Control (DAC) Authorization method based on the idea that there is an owner of a resource who may at his or her discretion assign access to that resource. DAC is considered much more flexible than MAC.

Disk Mirroring Process by which data is written simultaneously to two or more disk drives. Read and write speed is decreased but redundancy, in case of catastrophe, is increased.

Disk Striping Process by which data is spread among multiple (at least two) drives. It increases speed for both reads and writes of data. Considered RAID level 0, because it does *not* provide fault tolerance.

Disk Striping with Parity Provides fault tolerance by writing data across multiple drives, and includes an additional drive, called a *parity drive*, that stores information to rebuild the data contained on the other drives. Requires at least three physical disks: two for the data and a third for the parity drive. Provides data redundancy at RAID levels 3–5 with different options.

Distance Vector Set of routing protocols that calculates the total cost to get to a particular network ID and compares that cost to the total cost of all the other routes to get to that same network ID.

Dispersion Diffusion over distance of light propagating down fiber cable.

Distributed Coordination Function (DCF) One of two methods of collision avoidance defined by the 802.11 standard and the only one currently implemented. DCF specifies much stricter rules for sending data onto the network media.

Distributed Denial of Service (DDoS) Attack A DoS attack that uses multiple (as in hundreds up to hundreds of thousands) of computers under the control of a single operator to send a devastating attack.

DLL (Dynamic Link Library) A file of executable functions or data that can be used by a Windows application. Typically, a DLL provides one or more particular functions, and a program accesses the functions by creating links to the DLL.

DMZ (Demilitarized Zone) A lightly protected or unprotected subnet network positioned between an outer firewall and an organization's highly protected internal network. DMZs are used mainly to host public address servers (like a Web server).

DNS (Domain Name Service or System) A TCP/IP name resolution system that resolves host names to IP addresses.

DNS Domain A specific branch of the DNS name space. First-level DNS domains include .com, .gov, and .edu.

DNS Resolver Cache A cache used by Windows DNS clients to keep track of DNS information.

DNS Root Servers The highest in the hierarchy of DNS servers running the Internet.

DNS Server A system that runs a special DNS server program.

DNS Tree A hierarchy of DNS domains and individual computer names organized into a tree-like structure, the top of which is the root.

Document A medium and the data recorded on it for human use; for example, a report sheet or book. By extension, any record that has permanence and that can be read by a human or a machine.

Documentation A collection of organized documents or the information recorded in documents. Also instructional material specifying the inputs, operations, and outputs of a computer program or system.

Domain A term used to describe a grouping of users, computers, and/or networks. In Microsoft networking, a domain is a group of computers and users that shares a common account database and a common security policy. For the Internet, a domain is a group of computers that shares a common element in their DNS hierarchical name.

Domain Controller A Microsoft Windows Server system specifically configured to store user and server account information for its domain. Often abbreviated as "DC." Windows domain controllers store all account and security information in the *Active Directory* directory service.

Domain Information Grouper (DIG) Command-line tool in non-Windows systems used to diagnose DNS problems.

Domain Users and Groups Users and groups that are defined across an entire network domain.

Dotted Decimal Notation Shorthand method for discussing and configuring binary IP addresses.

Download The transfer of information from a remote computer system to the user's system. Opposite of upload.

Drive Duplexing The process of writing identical data to two hard drives on different controllers at the same time, to provide data redundancy.

Drive Mirroring The process of writing identical data to two hard drives on the same controller at the same time, to provide data redundancy.

DS0 The digital signal rate created by converting analog sound into 8-bit chunks 8000 times a second, with a data stream of 64 Kbps. This is the simplest data stream (and the slowest rate) of the digital part of the phone system.

DS1 The signaling method used by T1 lines, which uses a relatively simple frame consisting of 25 pieces: a framing bit and 24 channels. Each DS1 channel holds a single 8-bit DS0 data sample. The framing bit and data channels combine to make 193 bits per DS1 frame. These frames are transmitted 8000 times/sec, making a total throughput of 1.544 Mbps.

DSL Access Multiplexer (DSLAM) A device located in a telephone company's central office that connects multiple customers to the Internet.

DSL Modem A device that enables customers to connect to the Internet using a DSL connection. A DSL modem isn't really a modem—it's more like an ISDN terminal adapter—but the term stuck, and even the manufacturers of the devices now call them DSL modems.

DSP (Digital Signal Processor) A specialized microprocessor-like device that processes digital signals at the expense of other capabilities, much as the floating-point unit (FPU) is optimized for math functions. DSPs are used in such specialized hardware as high-speed modems, multimedia sound cards, MIDI equipment, and real-time video capture and compression.

Duplexing Also called *disk duplexing* or *drive duplexing*, similar to mirroring in that data is written to and read from two physical drives for fault tolerance. In addition, separate controllers are used for each drive, for both additional fault tolerance and additional speed. Considered RAID level 1.

Dynamic Addressing A way for a computer to receive IP information automatically from a server program. *See* DHCP (Dynamic Host Configuration Protocol).

Dynamic Link Library (DLL) *See* DLL (Dynamic Link Library).

Dynamic NAT Type of NAT in which many computers can share a pool of routable IP addresses that number fewer than the computers.

Dynamic Port Numbers Port numbers 49152–65535, recommended by the IANA to be used as ephemeral port numbers.

Dynamic Routing Process by which routers in an internetwork automatically exchange information with other routers. Requires a dynamic routing protocol, such as OSPF or RIP.

Dynamic Routing Protocol A protocol that supports the building of automatic routing tables, such as OSPF or RIP.

E1 The European counterpart of a T1 connection that carries 32 channels at 64 Kbps for a total of 2.048 Mbps—making it slightly faster than a T1.

E3 The European counterpart of a T3 line that carries 16 E1 lines (512 channels), for a total bandwidth of 34.368 Mbps—making it a little bit slower than an American T3.

Edge Router Router that connects one automated system (AS) to another.

Effective Permissions The permissions of all groups combined in any network operating system.

EIA/TIA (Electronics Industry Association/ Telecommunications Industry Association) The standards body that defines most of the standards for computer network cabling. Many of these standards are defined under the EIA/TIA 568 standard.

E-mail (Electronic Mail) Messages, usually text, sent from one person to another via computer. E-mail can also be sent automatically to a large number of addresses, known as a mailing list.

E-mail Client Program that runs on a computer and enables you to send, receive, and organize e-mail.

E-mail Server Also known as *mail server*, a server that accepts incoming mail, sorts the mail for recipients into mailboxes, and sends mail to other servers using SMTP.

EMI (Electro-Magnetic Interference) An electrical interference from one device to another, resulting in poor performance in the device capabilities. This is similar to having static on your TV while running a hair dryer, or placing two monitors too close together and getting a "shaky" screen.

Encapsulation The process of putting the packets from one protocol inside the packets of another protocol. An example of this is TCP/IP encapsulation in Ethernet, which places TCP/IP packets inside Ethernet frames.

Encryption A method of securing messages by scrambling and encoding each packet as it is sent across an unsecured medium, such as the Internet. Each encryption level provides multiple standards and options.

Endpoint In the TCP/IP world, the session information stored in RAM. *See also* Socket.

Endpoints Correct term to use when discussing the data each computer stores about the connection between two computers' TCP/IP applications. *See also* Socket Pairs.

Enhanced Interior Gateway Routing Protocol (EIGRP) Cisco's proprietary hybrid protocol that has elements of both distance vector and link state routing.

Ephemeral Port In TCP/IP communication, an arbitrary number generated by a sending computer that the receiving computer uses as a destination address when sending a return packet.

Ephemeral Port Numbers *See* Ephemeral Port.

Equipment Rack A metal structure used in equipment rooms to secure network hardware devices and patch panels. Most racks are 19" wide. Devices designed to fit in such a rack use a height measurement called *units*, or simply *U*.

Equipment Room A central location for computer or telephone equipment and, most importantly, centralized cabling. All cables usually run to the equipment room from the rest of the installation.

ESD (Electro-Static Discharge) The movement of electrons from one body to another. ESD is a real menace to PCs because it can cause permanent damage to semiconductors.

Ethernet Name coined by Xerox for the first standard of network cabling and protocols. Ethernet is based on a bus topology. The IEEE 802.3 subcommittee defines the current Ethernet specifications.

Executable Viruses Viruses that are literally extensions of executables and that are unable to exist by themselves. Once an infected executable file is run, the virus loads into memory, adding copies of itself to other EXEs that are subsequently run.

Extended Service Set (ESS) A single wireless access point servicing a given area that has been extended by adding more access points.

Extended Service Set ID (ESSID) An SSID applied to an Extended Service Set as a network naming convention.

Extended Unique Identifier, 64-bit (EUI-64) The last 64 bits of the IPv6 address, which are determined based off of a device's MAC address.

Extensible Authentication Protocol (EAP) Authentication wrapper that EAP-compliant applications can use to accept one of many types of authentication. While EAP is a general-purpose authentication wrapper, its only substantial use is in wireless networks.

External Data Bus (EDB) The primary data highway of all computers. Everything in your computer is tied either directly or indirectly to the EDB.

External Network Address A number added to the MAC address of every computer on an IPX/SPX network that defines every computer on the network; this is often referred to as a *network number*.

External Threats Threats to your network through external means; examples include virus attacks and the exploitation of users, security holes in the OS, or the network hardware itself.

FAQ (Frequently Asked Questions) Common abbreviation coined by BBS users and spread to Usenet and the Internet. This is a list of questions and answers that pertains to a particular topic, maintained so that users new to the group don't all bombard the group with similar questions. Examples are "What is the name of the actor who plays *X* on this show, and was he in anything else?" or "Can anyone list all of the books by this author in the order that they were published so that I can read them in that order?" The common answer to this type of question is "Read the FAQ!"

Fast Ethernet Nickname for the 100-Mbps Ethernet standards. Originally applied to 100BaseT.

Fault Tolerance The capability of any system to continue functioning after some part of the system has failed. RAID is an example of a hardware device that provides fault tolerance for hard drives.

Federal Communications Commission (FCC) In the United States, regulates public airwaves and rates PCs and other equipment according to the amount of radiation emitted.

FEXT (Far-End Crosstalk) Crosstalk on the opposite end of a cable from the signal's source.

Fiber-Optic Cable A high-speed physical medium for transmitting data that uses light rather than electricity to transmit data and is made of high-purity glass fibers sealed within a flexible opaque tube. Much faster than conventional copper wire.

File Server A computer designated to store software, courseware, administrative tools, and other data on a local or wide area network. It "serves" this information to other computers via the network when users enter their personal access codes.

Fire Ratings Ratings developed by Underwriters Laboratories (UL) and the National Electrical Code (NEC) to define the risk of network cables burning and creating noxious fumes and smoke.

Firewall A device that restricts traffic between a local network and the Internet.

FireWire An IEEE 1394 standard to send wide-band signals over a thin connector system that plugs into TVs, VCRs, TV cameras, PCs, and so forth. This serial bus developed by Apple and Texas Instruments enables connection of 60 devices at speeds ranging from 100 to 800 Mbps.

Flat Name Space A naming convention that gives each device only one name that must be unique. NetBIOS used a flat name space. TCP/IP's DNS uses a hierarchical name space.

Forward Lookup Zones The storage areas in DNS servers to store the IP addresses and names of systems for a particular domain or domains.

FQDN (Fully Qualified Domain Name) The complete DNS name of a system, from its host name to the top-level domain name.

Fractional T1 Access A service provided by many telephone companies wherein customers can purchase a number of individual channels in a T1 line in order to save money.

Frame A defined series of binary data that is the basic container for a discrete amount of data moving across a network. Also commonly called a *packet*.

Frame Check Sequence (FCS) A sequence of bits placed in a frame that is used to check the primary data for errors.

Frame Relay An extremely efficient data transmission technique used to send digital information such as voice, data, LAN, and WAN traffic quickly and cost-efficiently to many destinations from one port.

FreeRADIUS Free RADIUS server software for UNIX/Linux systems.

Freeware Software that is distributed for free, with no license fee.

Frequency Division Multiplexing (FDM) A process of keeping individual phone calls separate by adding a different frequency multiplier to each phone call, making it possible to separate phone calls by their unique frequency range.

Frequency-Hopping Spread-Spectrum (FHSS) A spread-spectrum broadcasting method defined in the 802.11 standard that sends data on one frequency at a time, constantly shifting (or *hopping*) frequencies.

FTP (File Transfer Protocol) A set of rules that allows two computers to talk to one another as a file transfer is carried out. This is the protocol used when you transfer a file from one computer to another across the Internet.

FUBAR Fouled Up Beyond All Recognition.

Full-Duplex Any device that can send and receive data simultaneously.

Fully Meshed Topology A mesh network where every node is directly connected to every other node.

Gain The strengthening and focusing of radio frequency output from a wireless access point (WAP).

Gateway Router A router that acts as a default gateway in a TCP/IP network.

Giga- The prefix that generally refers to the quantity 1,073,741,824. One gigabyte is 1,073,741,824 bytes. With frequencies, in contrast, giga- often refers to one billion. One gigahertz is 1,000,000,000 hertz.

Gigabit Ethernet *See* 1000BaseT.

Gigabyte 1024 megabytes.

Global Unicast Address A second IPv6 address that every system needs in order to get on the Internet.

Grandfather, Father, Son (GFS) A tape rotation strategy used in data backups.

Group Policy A feature of Windows Active Directory that allows an administrator to apply policy settings to network users *en masse*.

Group Policy Object (GPO) Enables network administrators to define multiple rights and permissions to entire sets of users all at one time.

Groups Collections of network users who share similar tasks and need similar permissions; defined to make administration tasks easier.

H.323 A VoIP standard that handles the initiation, setup, and delivery of VoIP sessions.

Hackers People who break into computer systems with malicious intent.

Half-Duplex Any device that can only send or receive data at any given moment.

Hardware Tools Tools such as cable testers, TDRs, OTDRs, certifiers, voltage event recorders, protocol analyzers, cable strippers, multimeters, tone probes/generators, butt sets, and punchdown tools used to configure and troubleshoot a network.

Hash A mathematical function used in cryptography that is run on a string of binary digits of any length that results in a value of some fixed length.

Hex (Hexadecimal) Hex symbols based on a numbering system of 16 (computer shorthand for binary numbers), using ten digits and six letters to condense zeroes and ones to binary numbers. Hex is represented by digits 0 through 9 and alpha *A* through *F*, so that 09h has a value of 9, and 0Ah has a value of 10.

Hierarchical Name Space A naming scheme where the full name of each object includes its position within the hierarchy. An example of a hierarchical name is www.totalseminars.com, which includes not only the host name, but also the domain name. DNS uses a hierarchical name space scheme for fully qualified domain names (FQDNs).

High availability A collection of technologies and procedures that work together to keep an application available at all times.

Home Page The Web page that your browser is set to use when it starts up or the main Web page for a business, organization, or person. Also, the main page in any collection of Web pages.

Honey Pot An area of a network that an administrator sets up for the express purpose of attracting a computer hacker. If a hacker takes the bait, the network's important resources are unharmed and network personnel can analyze the attack to predict and protect against future attacks, making the network more secure.

Hop The passage of a packet through a router.

Horizontal Cabling Cabling that connects the equipment room to the work areas.

Host A single device (usually a computer) on a TCP/IP network that has an IP address; any device that can be the source or destination of a data packet.

Host ID The portion of an IP address that defines a specific machine in a subnet.

Host Name Individual computer name in the DNS naming convention.

HOSTNAME Command-line tool that returns the host name of the computer it is run on.

HOSTS File The predecessor to DNS, a static text file that resides on a computer and is used to resolve DNS host names to IP addresses. The HOSTS file is checked before the machine sends a name resolution request to a DNS name server. The HOSTS file has no extension.

HTML (Hypertext Markup Language) An ASCII-based script-like language for creating hypertext documents like those on the World Wide Web.

HTTP (Hypertext Transfer Protocol) Extremely fast protocol used for network file transfers in the WWW environment.

HTTP over SSL (HTTPS) A secure form of HTTP, used commonly for Internet business transactions or any time where a secure connection is required. *See also* HTTP (Hypertext Transfer Protocol) and SSL (Secure Sockets Layer).

Hub An electronic device that sits at the center of a star topology network, providing a common point for the connection of network devices. In a 10BaseT Ethernet network, the hub contains the electronic equivalent of a properly terminated bus cable. Hubs are rare today, replaced by switches.

Hybrid Topology A mix or blend of two different topologies. A star-bus topology is a hybrid of the star and bus topologies.

Hypertext A document that has been marked up to enable a user to select words or pictures within the document, click them, and connect to further information. The basis of the World Wide Web.

IANA (Internet Assigned Numbers Authority) The organization responsible for assigning public IP addresses. IANA no longer directly assigns IP addresses, having delegated this to the five Regional Internet Registries. *See* Regional Internet Registries.

ICF (Internet Connection Firewall) The software firewall built into Windows XP that protects your system from unauthorized access from the Internet. Microsoft changed the name to the Windows Firewall in Windows Service Pack 2.

ICS (Internet Connection Sharing) Also known simply as *Internet sharing*, the technique of enabling more than one computer to access the Internet simultaneously using a single Internet connection. When you use Internet sharing, you connect an entire LAN to the Internet using a single public IP address.

IDF (Intermediate Distribution Frame) The room where all the horizontal runs from all the work areas on a given floor in a building come together.

IEEE (Institute of Electrical and Electronics Engineers) The leading standards-setting group in the United States.

IEEE 802.2 IEEE subcommittee that defined the standards for Logical Link Control (LLC).

IEEE 802.3 IEEE subcommittee that defined the standards for CSMA/CD (a.k.a. *Ethernet*).

IEEE 802.11 IEEE subcommittee that defined the standards for wireless.

IEEE 802.14 IEEE subcommittee that defined the standards for cable modems.

IEEE 1284 The IEEE standard for the now obsolete parallel communication.

IEEE 1394 IEEE standard for FireWire communication.

IETF (Internet Engineering Task Force) The primary standards organization for the Internet.

IFCONFIG A command-line utility for Linux servers and workstations that displays the current TCP/IP configuration of the machine, similar to IPCONFIG and WINIPCFG for Windows systems.

IMAP (Internet Message Access Protocol) An alternative to POP3. IMAP retrieves e-mail from an e-mail server, like POP3; IMAP uses TCP port 143.

Impedance The amount of resistance to an electrical signal on a wire. It is used as a relative measure of the amount of data a cable can handle.

Incremental Backup Backs up all files that have their archive bits turned on, meaning they have been changed since the last backup. This type of backup turns the archive bits off after the files have been backed up.

Independent Basic Service Set (IBSS) A basic unit of organization in wireless networks formed by two or more wireless nodes communicating in ad hoc mode.

Infrastructure Mode Mode in which wireless networks use one or more wireless access points to connect the wireless network nodes centrally. This configuration is similar to the *star topology* of a wired network.

Inheritance A method of assigning user permissions, in which folder permissions flow downward into subfolders.

Insulating Jacket The external plastic covering of a fiber-optic cable.

Integrated Services Digital Network (ISDN) The process of sending telephone transmission across fully digital lines end to end.

Interframe Space (IFS) Short, predefined period of silence in CSMA/CA appended to the waiting time when a device detects activity on the line.

Intermediate System to Intermediate System (IS-IS) Protocol similar to, but not as popular as, OSPF, but with support for IPv6 since inception.

Internal Network A private LAN, with a unique network ID, that resides behind a router.

Internal Threats All the things that a network's own users do to create problems on the network. Examples include accidental deletion of files, accidental damage to hardware devices or cabling, and abuse of rights and permissions.

Internet Authentication Service (IAS) Popular RADIUS server for Microsoft environments.

Internet Connection Firewall (ICF) *See* ICF (Internet Connection Firewall).

Internet Connection Sharing (ICS) *See* ICS (Internet Connection Sharing).

Internet Control Message Protocol (ICMP) Protocol in which messages consist of a single packet and are connectionless. ICMP packets determine connectivity between two hosts.

Internet Group Management Protocol (IGMP) Protocol that routers use to communicate with hosts to determine a "group" membership in order to determine which computers want to receive a multicast.

Internet Information Services (IIS) Microsoft's Web server program for managing Web servers.

Internet Message Access Protocol Version 4 (IMAP4) An alternative to POP3 for receiving e-mail from an e-mail server. Supports searching through messages stored on a server and supports using folders to organize e-mail.

Internet Protocol Version 4 (IPv4) Protocol in which addresses consist of four sets of numbers, each number being a value between 0 and 255, using a period to separate the numbers. Often called *dotted decimal* format. No IPv4 address may be all 0s or all 255s. Examples include 192.168.0.1 and 64.176.19.164.

Internet Protocol Version 6 (IPv6) Protocol in which addresses consist of eight sets of four hexadecimal numbers, each number being a value between 0000 and FFFF, using a colon to separate the numbers. No IP address may be all 0s or all 255s. An example is FEDC:BA98:7654:3210:0800:200C:00CF:1234.

InterNIC The organization that maintains the DNS services, registrations, and so forth run by Network Solutions, General Atomics, and AT&T.

InterVLAN Routing A feature on some switches to create virtual routers.

Intra-Site Automatic Tunnel Addressing Protocol An IPv6 tunneling protocol that adds the IPv4 address to an IPv6 prefix.

Intranet A private TCP/IP network inside a company or organization.

Intrusion Detection/Intrusion Prevention A process used to protect networks from intrusion and to detect that something has intruded into a network.

IP (Internet Protocol) The Internet standard protocol that handles the logical naming for the TCP/IP protocol, using IP addresses.

IP Address The numeric address of a computer connected to a TCP/IP network, such as the Internet. The IP address is made up of four octets of 8-bit binary numbers that are translated by the computer into their shorthand numeric values; for example:

11000000.10101000.00000100.00011010 = 192.168.4.26

IP addresses must be matched with a valid subnet mask, which identifies the part of the IP address that is the network ID and the part that is the host ID.

IP Filtering A method of blocking packets based on IP addresses.

IPCONFIG A command-line utility for Windows that displays the current TCP/IP configuration of the machine; similar to UNIX/Linux's IFCONFIG.

IPSec (IP Security) A IP packet encryption protocol. IPSec is the only IP encryption protocol to work at Layer 3 of the OSI seven-layer model. IPSec is most commonly seen on Virtual Private Networks. *See* VPN (Virtual Private Network).

IRC (Internet Relay Chat) An online group discussion. Also called *chat*.

ISDN (Integrated Services Digital Network) The CCITT (Comité Consutatif Internationale Téléphonique et Télégraphique) standard that defines a digital method for telephone communications. Originally designed to replace the current analog telephone systems. ISDN lines have telephone numbers and support up to 128-Kbps transfer rates. ISDN also allows data and voice to share a common phone line. Never very popular, ISDN is now relegated to specialized niches.

ISP (Internet Service Provider) An institution that provides access to the Internet in some form, usually for a fee.

IT (Information Technology) The business of computers, electronic communications, and electronic commerce.

Java A network-oriented programming language invented by Sun Microsystems and specifically designed for writing programs that can be safely downloaded to your computer through the Internet and immediately run without fear of viruses or other harm to your computer or files. Using small Java programs (called *applets*), Web pages can include functions such as animations, calculators, and other fancy tricks.

Just a Bunch of Disks (JBOD) An array of hard drives that are simply connected with no RAID implementations.

K- Most commonly used as the suffix for the binary quantity 1024. 640 K means 640 × 1024 or 655,360. Just to add some extra confusion to the IT industry, *K* is often misspoken as "kilo," the metric value for 1000. 10 KB, for example, spoken as "10 kilobytes," means 10,240 bytes rather than 10,000 bytes.

Kbps (Kilobits Per Second) Data transfer rate.

Kerberos An authentication standard designed to allow different operating systems and applications to authenticate each other.

Key Distribution Center (KDC) System for granting authentication in Kerberos.

Key Pair Name for the two keys generated in asymmetric-key algorithm systems.

Kilohertz (KHz) A unit of measure that equals a frequency of 1000 cycles per second.

LAN (Local Area Network) A group of PCs connected together via cabling, radio, or infrared that use this connectivity to share resources such as printers and mass storage.

Last Mile The connection between a central office and individual users in a telephone system.

Layer A grouping of related tasks involving the transfer of information. Also, a particular level of the OSI seven-layer model; for example, Physical layer, Data Link layer, and so forth.

Layer 2 Switch Any device that filters and forwards data packets based on the MAC addresses of the sending and receiving machines. What we normally call a "switch" is actually a "Layer 2 switch."

Layer 2 Tunneling Protocol (L2TP) A VPN protocol developed by Cisco that can be run on almost any connection imaginable. LT2P has no authentication or encryption, but uses IPSec for all its security needs.

Layer 3 Switch Also known as a *router*, filters and forwards data packets based on the IP addresses of the sending and receiving machines.

LC A duplex type of Small Form Factor (SFF) fiber connector, designed to accept two fiber cables.

LED (Light Emitting Diodes) Solid-state devices that vibrate at luminous frequencies when current is applied.

Light Leakage The type of interference caused by bending a piece of fiber-optic cable past its maximum bend radius. Light bleeds through the cladding, causing signal distortion and loss.

Lightweight Extensible Authentication Protocol (LEAP) A proprietary EAP authentication used almost exclusively by Cisco wireless products. LEAP is an interesting combination of MS-CHAP authentication between a wireless client and a RADIUS server.

Link Light An LED on NICs, hubs, and switches that lights up to show good connection between the devices.

Link-Local Address The address that a computer running IPv6 gives itself after first booting. The first 64 bits of a link-local address is always FE80::/64.

Link Segments Segments that link other segments together but are unpopulated or have no computers directly attached to them.

Link State Type of dynamic routing protocol that announces only changes to routing tables, as opposed to entire routing tables. Compare to distance vector routing protocols.

Linux The popular open source UNIX-clone operating system.

Listening Port A socket that is prepared to respond to any IP packets destined for that socket's port number.

LMHOSTS File A static text file that resides on a computer and is used to resolve NetBIOS names to IP addresses. The LMHOSTS file is checked before the machine sends a name resolution request to a WINS name server. The LMHOSTS file has no extension.

Load Balancing The process of taking several servers and making them look like a single server.

Local Refers to the computer(s), server(s), and/or LAN that a user is physically using or that is in the same room or building.

Local Connector One popular type of Small Form Factor (SFF) connector, considered by many to be the predominant fiber connector.

Local User Accounts The accounts unique to a single Windows system. Stored in the local system's registry.

Localhost The HOSTS file alias for the loopback address of 127.0.0.1, referring to the current machine.

Logical Address A programmable network address, unlike a physical address that is burned into ROM.

Logical Network Diagram A document that shows the broadcast domains and individual IP addresses for all devices on the network. Only critical switches and routers are shown.

Logical Topology A network topology defined by signal paths as opposed to the physical layout of the cables. *See also* Physical Topology.

Loopback Address Sometimes called the localhost, a reserved IP address used for internal testing: 127.0.0.1.

Loopback Plug Network connector that connects back into itself, used to connect loopback tests.

Loopback Test A special test often included in diagnostic software that sends data out of the NIC and checks to see if it comes back.

MAC (Media Access Control) Address Unique 48-bit address assigned to each network card. IEEE assigns blocks of possible addresses to various NIC manufacturers to help ensure that each address is unique. The Data Link layer of the OSI seven-layer model uses MAC addresses for locating machines.

MAC Address Filtering A method of limiting access to a wireless network based on the physical addresses of wireless NICs.

MAC Filtering *See* MAC Address Filtering.

Macro A specially written application macro (collection of commands) that performs the same functions as a virus. These macros normally autostart when the application is run and then make copies of themselves, often propagating across networks.

Mailbox Special holding area on an e-mail server that separates out e-mail for each user.

Malware Any program or code (macro, script, and so on) that's designed to do something on a system or network that you don't want to have happen.

MAN (Metropolitan Area Network) A group of computers connected via cabling, radio, leased phone lines, or infrared that is within the same city. A typical example of a MAN is a college campus. No firm dividing lines dictate what is considered a WAN, MAN, or LAN.

Managed Device Networking devices, such as routers and advanced switches, that must be configured to use.

Management Information Base (MIB) SNMP's version of a server. *See* SNMP (Simple Network Management Protocol).

Mandatory Access Control (MAC) A security model in which every resource is assigned a label that defines its security level. If the user lacks that security level, they do not get access.

MB (Megabyte) 1,048,576 bytes.

MD5 Arguably the most popular hashing function.

MDF (Main Distribution Frame) The room in a building that stores the demarc, telephone cross-connects, and LAN cross-connects.

Media Converter A device that lets you interconnect different types of Ethernet cable.

Mega- A prefix that usually stands for the binary quantity 1,048,576. One megabyte is 1,048,576 bytes. One megahertz, however, is a million hertz. Sometimes shortened to *meg*, as in "a 286 has an address space of 16 megs."

Mesh Topology Topology in which each computer has a direct or indirect connection to every other computer in a network. Any node on the network can forward traffic to other nodes. Popular in cellular and many wireless networks.

Metric Relative value that defines the "cost" of using a particular route.

MHz (Megahertz) A unit of measure that equals a frequency of 1 million cycles per second.

MIME (Multipurpose Internet Mail Extensions) A standard for attaching binary files, such as executables and images, to the Internet's text-based mail (24-Kbps packet size).

Mirroring Also called *drive mirroring*, reading and writing data at the same time to two drives for fault-tolerance purposes. Considered RAID level 1.

Modal Distortion A light distortion problem unique to multimode fiber-optic cable.

Modem (Modulator-Demodulator) A device that converts both digital bit streams into analog signals (modulation) and incoming analog signals back into digital signals (demodulation). Most commonly used to interconnect telephone lines to computers.

Mounting Bracket Bracket that acts as a holder for a faceplate in cable installations.

MS-CHAP Microsoft's dominant variation of the CHAP protocol, uses a slightly more advanced encryption protocol.

MSA (Multisource Agreement) Interchangeable modular transceivers used in 10-GbE networking devices.

MT-RJ (Mechanical Transfer Registered Jack) The first type of Small Form Factor (SFF) fiber connector, still in common use.

Multi-Protocol Label Switching (MPLS) A router feature that labels certain data to use a desired connection. It works with any type of packet switching (even Ethernet) to force certain types of data to use a certain path.

Multicast Method of sending a packet in which the sending computer sends it to a group of interested computers.

Multicast Addresses In IPv6, a set of reserved addresses designed to go only to certain systems.

Multilayer Switch A switch that has functions that operate at multiple layers of the OSI seven-layer model.

Multimeter A tool for testing voltage (AC and DC), resistance, and continuity.

Multimode Type of fiber-optic cable that uses LEDs.

Multiple In/Multiple Out (MIMO) A feature in 802.11 WAPs that enables them to make multiple simultaneous connections.

Multiplexer A device that merges information from multiple input channels to a single output channel.

Multispeed Hub Any hub that supports more than one network speed for otherwise similar cabling systems. Multispeed hubs come in two flavors: one has mostly dedicated slower ports, with a few dedicated faster ports, while the other has only special auto-sensing ports that automatically run at either the faster or the slower speed.

MX Records Records used by SMTP servers to determine where to send mail.

My Traceroute (MTR) Terminal command in Linux that dynamically displays the route a packet is taking. Similar to TRACEROUTE.

Name Resolution A method that enables one computer on the network to locate another to establish a session. All network protocols perform name resolution in one of two ways: *broadcasting* or by providing some form of *name server*.

Name Server A computer whose job is to know the name of every other computer on the network.

NAT (Network Address Translation) A means of translating a system's IP address into another IP address before sending it out to a larger network. NAT manifests itself by a NAT program that runs on a system or a router. A network using NAT provides the systems on the network with private IP addresses. The system running the NAT software has two interfaces: one connected to the network and the other connected to the larger network.

The NAT program takes packets from the client systems bound for the larger network and translates their internal private IP addresses to its own public IP address, enabling many systems to share a single IP address.

NAT Translation Table Special database in a NAT router that stores destination IP addresses and ephemeral source ports from outgoing packets and compares them against returning packets.

NBTSTAT A command-line utility used to check the current NetBIOS name cache on a particular machine. The utility compares NetBIOS names to their corresponding IP addresses.

NetBEUI (NetBIOS Extended User Interface) Microsoft's first networking protocol, designed to work with NetBIOS. NetBEUI is long obsolesced by TCP/IP. NetBEUI did not support routing.

NetBIOS (Network Basic Input/Output System) A protocol that operates at the Session layer of the OSI seven-layer model. This protocol creates and manages connections based on the names of the computers involved.

NetBIOS Name A computer name that identifies both the specific machine and the functions that machine performs. A NetBIOS name consists of 16 characters: the first 15 are an alphanumeric name, and the 16th is a special suffix that identifies the role the machine plays.

NETSTAT A universal command-line utility used to examine the TCP/IP connections open on a given host.

Network A collection of two or more computers interconnected by telephone lines, coaxial cables, satellite links, radio, and/or some other communication technique. A computer *network* is a group of computers that

are connected together and communicate with one another for a common purpose. Computer networks support "people and organization" networks, users who also share a common purpose for communicating.

Network Access Server (NAS) Systems that control the modems in a RADIUS network.

Network ID A number used in IP networks to identify the network on which a device or machine exists.

Network Interface A device by which a system accesses a network. In most cases, this is a NIC or a modem.

Network Layer Layer 3 of the OSI seven-layer model. *See* OSI Seven-Layer Model.

Network Management Software (NMS) Tools that enable you to describe, visualize, and configure an entire network.

Network Protocol Special software that exists in every network-capable operating system that acts to create unique identifiers for each system. It also creates a set of communication rules for issues like how to handle data chopped up into multiple packets, and how to deal with routers. TCP/IP is the dominant network protocol today.

Network Share A shared resource on a network.

Network Threat Any number of things that share one essential feature: the potential to damage network data, machines, or users.

Network Time Protocol (NTP) Protocol that gives the current time.

Network Topology Refers to the way that cables and other pieces of hardware connect to one another.

Newsgroup The name for a discussion group on USENET.

NEXT (Near-End Crosstalk) Crosstalk at the same end of a cable as the signal is being generated from.

Next Hop The next router a packet should go to at any given point.

NFS (Network File System) A TCP/IP file system–sharing protocol that enables systems to treat files on a remote machine as though they were local files. NFS uses TCP port 2049 but many users choose alternative port numbers. Though still somewhat popular and heavily supported, NFS has been largely replaced by Samba/CIFS. *See both* Samba and CIFS.

NIC (Network Interface Card) Traditionally, an expansion card that enables a PC to physically link to a network. Modern computers now use built-in NICs, no longer requiring physical cards, but the term "NIC" is still very common.

NIU (Network Interface Unit) Another name for a demarc. *See* Demarc.

Node A member of a network or a point where one or more functional units interconnect transmission lines.

Noise Undesirable signals bearing no desired information and frequently capable of introducing errors into the communication process.

Non-Discovery Mode A setting for Bluetooth devices that effectively hides them from other Bluetooth devices.

Nonrepudiation The process that guarantees that the data is as originally sent and that it came from the source you think it should have come from.

Normal Backup A full backup of every selected file on a system. This type of backup turns off the archive bit after the backup.

Novell NetWare A powerful, unique, and once dominant network operating system that operated on a client/server model.

Ns (Nanosecond) A billionth of a second. Light travels a little over 11 inches in 1 ns.

NS Records Records that list the DNS servers for a Web site.

NSLOOKUP A once handy tool that advanced techs used to query the functions of DNS servers. Most DNS servers now ignore all but the most basic NSLOOKUP queries.

NTFS (NT File System) A file system for hard drives that enables object-level security, long filename support, compression, and encryption. NTFS 4.0 debuted with Windows NT 4.0. Windows 2000/XP/2003 come with NTFS 5.0.

NTFS Permissions Groupings of what Microsoft calls special permissions that have names like Execute, Read, and Write, and that allow or disallow users certain access to files.

NTLDR A Windows NT/2000/XP/2003 boot file. Launched by the MBR or MFT, NTLDR looks at the BOOT.INI configuration file for any installed operating systems.

Object A group of related counters used in Windows logging utilities.

OEM (Original Equipment Manufacturer) Contrary to the name, does not create original hardware, but rather purchases components from manufacturers and puts them together in systems under its own brand name. Dell, Inc. and Gateway, Inc., for example, are for the most part OEMs. Apple, Inc., which manufactures most of the components for its own Macintosh-branded machines, is not an OEM. Also known as *VARs (value-added resellers)*.

Ohm Rating Electronic measurement of a cable's or an electronic component's impedance.

Open Port *See* Listening Port.

Open Source Applications and operating systems that offer access to their source code; this enables developers to modify applications and operating systems easily to meet their specific needs.

OpenSSH A series of secure programs developed by the OpenBSD organization to fix SSH's limitation of only being able to handle one session per tunnel.

Optical Carrier (OC) Specification used to denote the optical data carrying capacity (in Mbps) of fiber-optic cables in networks conforming to the SONET standard. The OC standard is an escalating series of speeds, designed to meet the needs of medium-to-large corporations. SONET establishes OCs from 51.8 Mbps (OC-1) to 39.8 Gbps (OC-768).

Orthogonal Frequency-Division Multiplexing (OFDM) A spread-spectrum broadcasting method that combines the multiple frequencies of DSSS with FHSS's hopping capability.

OS (Operating System) The set of programming that enables a program to interact with the computer and provides an interface between the PC and the user. Examples are Microsoft Windows XP, Apple Macintosh OS X, and SUSE Linux.

Oscilloscope A device that gives a graphical/visual representation of signal levels over a period of time.

OSI (Open Systems Interconnection) An international standard suite of protocols defined by the International Organization for Standardization (ISO) that implements the OSI seven-layer model for network communications between computers.

OSI Seven-Layer Model An architecture model based on the OSI protocol suite, which defines and standardizes the flow of data between computers. The following lists the seven layers:

- **Layer 1** The **Physical layer** defines hardware connections and turns binary into physical pulses (electrical or light). Repeaters and hubs operate at the Physical layer.
- **Layer 2** The **Data Link layer** identifies devices on the Physical layer. MAC addresses are part of the Data Link layer. Bridges operate at the Data Link layer.
- **Layer 3** The **Network layer** moves packets between computers on different networks. Routers operate at the Network layer. IP and IPX operate at the Network layer.
- **Layer 4** The **Transport layer** breaks data down into manageable chunks. TCP, UDP, SPX, and NetBEUI operate at the Transport layer.
- **Layer 5** The **Session layer** manages connections between machines. NetBIOS and Sockets operate at the Session layer.
- **Layer 6** The **Presentation layer**, which c an also manage data encryption, hides the differences between various types of computer systems.
- **Layer 7** The **Application layer** provides tools for programs to use to access the network (and the lower layers). HTTP, FTP, SMTP, and POP3 are all examples of protocols that operate at the Application layer.

OSPF (Open Shortest Path First) An interior gateway routing protocol developed for IP networks based on the *shortest path first* or *link-state algorithm*.

OTDR (Optical Time Domain Reflectometer) Tester for fiber-optic cable that determines continuity and reports the location of cable breaks.

OUI (Organizationally Unique Identifier) The first 24 bits of a MAC address, assigned to the NIC manufacturer by the IEEE.

Overloaded NAT The most popular type of NAT, in which a single public IP is shared by a number of computers that, in most cases, share a private network ID.

Packet Basic component of communication over a network. A group of bits of fixed maximum size and well-defined format that is switched and transmitted as a complete whole through a network. It contains source and destination address, data, and control information. *See also* Frame.

Packet Filtering A mechanism that blocks any incoming or outgoing packet from a particular IP address or range of IP addresses. Also known as *IP filtering*.

Packet Sniffer A tool that intercepts and logs network packets.

Pad Extra data added to an Ethernet frame to bring the data up to the minimum required size of 64 bytes.

PAP (Password Authentication Protocol) The oldest and most basic form of authentication, and also the least safe because it sends all passwords in cleartext.

Partially Meshed Topology A mesh topology in which not all of the nodes are directly connected.

Password A series of characters that enables a user to gain access to a file, a folder, a PC, or a program.

Patch Cables Short (2 to 5 foot) UTP cables that connect patch panels to the hubs.

Patch Panel A panel containing a row of female connectors (ports) that terminate the horizontal cabling in the equipment room. Patch panels facilitate cabling organization and provide protection to horizontal cabling.

PBX (Private Branch Exchange) A private phone system used within an organization.

PDA (Personal Digital Assistant) A hand-held computer that blurs the line between the calculator and computer. Earlier PDAs were calculators that enabled the user to program in such information as addresses and appointments. Newer machines, such as the Palm Pilot, are fully programmable computers. Most PDAs use a pen/stylus for input rather than a keyboard. A few of the larger PDAs have a tiny keyboard in addition to the stylus.

Peer-to-Peer A network in which each machine can act as either a client or a server.

Peer-to-Peer Mode *See* Ad Hoc Mode.

Performance Monitor (PerfMon) The Windows XP logging utility.

Permissions Sets of attributes that network administrators assign to users and groups that define what they can do to resources.

Persistent Connection A connection to a shared folder or drive that the computer immediately reconnects to at logon.

Personal Area Network (PAN) The network created among Bluetooth devices such as PDAs, printers, keyboards, mice, and so on.

Phishing A social engineering technique where the attacker poses as a trusted source in order to obtain sensitive information.

Physical Address An address burned into a ROM chip on a NIC. A MAC address is an example of a physical address.

Physical Layer *See* OSI Seven-Layer Model.

Physical Network Diagram A document that shows all of the physical connections on a network. Cabling type, protocol, and speed are also listed for each connection.

Physical Topology The manner in which the physical components of a network are arranged.

PING (Packet Internet Groper) A small network message (ICMP ECHO) sent by a computer to check for the presence and aliveness of another. Also used to verify the presence of another system.

Plain Old Telephone Service (POTS)
See Public Switched Telephone Network (PSTN).

Plaintext Data that is in an easily read or viewed industry-wide standard format.

Platform Hardware environment that supports the running of a computer system.

Plenum Usually a space between a building's false ceiling and the floor above it. Most of the wiring for networks is located in this space. Plenum is also a fire rating for network cabling.

Point Coordination Function (PCF) A method of collision avoidance defined by the 802.11 standard, which has yet to be implemented.

Point-to-Multipoint Topology in which one device communicates with more than one other device on a network.

Point-to-Point A network of two single devices communicating with each other.

Point-to-Point Protocol over Ethernet (PPPoE) A protocol that was originally designed to encapsulate PPP frames into Ethernet frames. Used by DSL providers to force customers to log into their DSL connections instead of simply connecting automatically.

POP3 (Post Office Protocol Version 3) One of the two protocols that receive e-mail from SMTP servers. POP3 uses TCP port 110. Most e-mail clients use this protocol, although some use IMAP4.

Port That portion of a computer through which a peripheral device may communicate. Often identified with the various plug-in jacks on the back of your computer. On a network hub, it is the connector that receives the wire link from a node. In TCP/IP, ports are 16-bit numbers between 0 and 65,535 assigned to a particular TCP/IP session.

Port Address Translation (PAT) Term used to refer to either overloaded NAT or port forwarding, but never at the same time.

Port Authentication Function of many advanced networking devices that authenticates a connecting device at the point of connection.

Port Blocking Preventing the passage of any TCP or UDP packets through any ports other than the ones prescribed by the system administrator.

Port Filtering *See* Port Blocking.

Port Forwarding Preventing the passage of any IP packets through any ports other than the ones prescribed by the system administrator.

Port Mirroring The capability of many advanced switches to mirror data from any or all physical ports on a switch to a single physical port. Useful for any type of situation where an administrator needs to inspect packets coming to or from certain computers.

Port Number Number used to identify the requested service (such as SMTP or FTP) when connecting to a TCP/IP host. Some example port numbers include 80 (HTTP), 20 (FTP), 69 (TFTP), 25 (SMTP), and 110 (POP3).

PostScript A language defined by Adobe Systems, Inc. for describing how to create an image on a page. The description is independent of the resolution of the device that will create the image. It includes a technology for defining the shape of a font and creating a raster image at many different resolutions and sizes.

Power Users A user account that has the capability to do many, but not all, of the basic administrator functions.

PPP (Point-to-Point Protocol) A protocol that enables a computer to connect to the Internet through a dial-in connection and to enjoy most of the benefits of a direct connection. PPP is considered to be superior to SLIP because of its error detection and data compression features, which SLIP lacks, and the capability to use dynamic IP addresses.

PPPoE (PPP over Ethernet) *See* Point-to-Point Protocol over Ethernet (PPoE).

PPTP (Point-to-Point Tunneling Protocol) A protocol that works with PPP to provide a secure data link between computers using encryption.

Preamble A 64-bit series of alternating ones and zeroes ending with 11 that begins every Ethernet frame. The preamble gives a receiving NIC time to realize a frame is coming and to know exactly where the frame starts.

Presentation Layer *See* OSI Seven-Layer Model.

Primary Lookup Zones Forward lookup zones stored in text files. *See* Forward Lookup Zones.

Primary Rate Interface (PRI) A type of ISDN that is actually just a full T1 line carrying 23 B channels.

Private Port Numbers *See* Dynamic Port Numbers.

Program A set of actions or instructions that a machine is capable of interpreting and executing. Used as a verb, it means to design, write, and test such instructions.

Promiscuous Mode A mode of operation for a NIC in which the NIC processes all packets that it sees on the cable.

Prompt A character or message provided by an operating system or program to indicate that it is ready to accept input.

Proprietary Term used to describe technology that is unique to, and owned by, a particular vendor.

Protected Extensible Authentication Protocol (PEAP) An authentication protocol that uses a password function based on MS-CHAPv2 with the addition of an encrypted TLS tunnel similar to EAP-TLS.

Protocol An agreement that governs the procedures used to exchange information between cooperating entities; usually includes how much information is to be sent, how often it is sent, how to recover from transmission errors, and who is to receive the information.

Protocol Analyzer A tool that monitors the different protocols running at different layers on the network that can give Application, Session, Network, and Data Link layer information on every frame going through a network.

Protocol Stack The actual software that implements the protocol suite on a particular operating system.

Protocol Suite A set of protocols that are commonly used together and operate at different levels of the OSI seven-layer model.

Proxy Server A device that fetches Internet resources for a client without exposing that client directly to the Internet. Most proxy servers accept requests for HTTP, FTP, POP3, and SMTP resources. The proxy server often caches, or stores, a copy of the requested resource for later use.

PSTN (Public Switched Telephone Network) *See* Public Switched Telephone Network (PSTN).

Public-Key Cryptography A method for exchanging digital keys securely.

Public-Key Infrastructure (PKI) The system for creating and distributing digital certificates using sites like VeriSign, thawte, or GoDaddy.

Public Switched Telephone Network (PSTN) Also known as *POTS (Plain Old Telephone Service)*. Most common type of phone connection, which takes your sounds, translated into an analog waveform by the microphone, and transmits them to another phone.

Punchdown Tool A specialized tool for connecting UTP wires to an RJ-45 jack.

PVC (Polyvinyl Chloride) A material used for the outside insulation and jacketing of most cables. Also a fire rating for a type of cable that has no significant fire protection.

Quality of Service (QoS) Policies that control how much bandwidth a protocol, PC, user, VLAN, or IP address may use.

Raceway Cable organizing device that adheres to walls, making for a much simpler, though less neat, installation than running cables in the walls.

RADIUS Server A system that enables remote users to connect to a network service.

RAID (Redundant Array of Independent [or Inexpensive] Devices [or Disks]) A way of creating a fault-tolerant storage system. There are six levels. Level 0 uses byte-level striping and provides no fault tolerance. Level 1 uses mirroring or duplexing. Level 2 uses bit-level striping. Level 3 stores error-correcting information (such as parity) on a separate disk, and uses data striping on the remaining drives. Level 4 is level 3 with block-level striping. Level 5 uses block-level and parity data striping.

RCP (Remote Copy) Provides the capability to copy files to and from the remote server without the need to resort to FTP or NFS (Network File System, UNIX form of folder sharing). RCP can also be used in scripts and shares TCP port 514 with RSH.

Real-Time Processing The processing of transactions as they occur, rather than batching them. Pertaining to an application in which response to input is fast enough to affect subsequent inputs and guide the process and in which records are updated immediately. The lag from input time to output time must be sufficiently small for acceptable timeliness. Timeliness is a function of the total system: missile guidance requires output within a few milliseconds of input, whereas scheduling of steamships requires a response time in days. Real-time systems are those with a response time of milliseconds; interactive systems respond in seconds; and batch systems may respond in hours or days.

Real-time Transport Protocol (RTP) Protocol that defines the type of packets used on the Internet to move voice or data from a server to clients. The vast majority of VoIP solutions available today use RTP.

REGEDIT.EXE A program used to edit the Windows registry.

Regional Internet Registries (RIRs) Entities under the oversight of the Internet Assigned Numbers Authority (IANA), which parcels out IP addresses.

Registered Ports Port numbers from 1024 to 49151. Anyone can use these port numbers for their servers or for ephemeral numbers on clients.

Regulations Rules of law or policy that govern behavior in the workplace, such as what to do when a particular event occurs.

Remote Refers to the computer(s), server(s), and/or LAN that cannot be physically used due to its distance from the user.

Remote Access The capability to access a computer from outside a building in which it is housed. Remote access requires communications hardware, software, and actual physical links.

Remote Access Server (RAS) Refers to both the hardware component (servers built to handle the unique stresses of a large number of clients calling in) and the software component (programs that work with the operating system to allow remote access to the network) of a remote access solution.

Remote Authentication Dial-In User Service (RADIUS) An AAA standard created to support ISPs with hundreds if not thousands of modems in hundreds of computers to connect to a single central database. RADIUS consists of three devices: the RADIUS server that has access to a database of user names and passwords, a number of network access servers (NASs) that control the modems, and a group of systems that dial into the network.

Remote Installation Services (RIS) A tool introduced with Windows 2000 that can be used to initiate either a scripted installation or an installation of an image of an operating system onto a PC.

Remote Terminal A connection on a faraway computer that enables you to control that computer as if you were sitting in front of it, logged in. Remote terminal programs all require a server and a client. The server is the computer to be controlled. The client is the computer from which you do the controlling.

Repeater A device that takes all of the data packets it receives on one Ethernet segment and re-creates them on another Ethernet segment. This allows for longer cables or more computers on a segment. Repeaters operate at Level 1 (Physical) of the OSI seven-layer model.

Replication A process where multiple computers might share complete copies of the database and constantly update each other.

Resistance The tendency for a physical medium to impede electron flow. It is classically measured in a unit called *ohms*.

Resource Anything that exists on another computer that a person wants to use without going to that computer. Also an online information set or an online interactive option. An online library catalog and the local school lunch menu are examples of information sets. Online menus or graphical user interfaces, Internet e-mail, online conferences, Telnet, FTP, and Gopher are examples of interactive options.

Reverse Lookup Zones A DNS setting that resolves IP addresses to FQDNs. In other words, it does exactly the reverse of what DNS normally accomplishes using forward lookup zones.

RG Ratings Ratings developed by the U.S. military to provide a quick reference for the different types of coax.

Ring Topology A network topology in which all the computers on the network attach to a central ring of cable.

RIP (Routing Information Protocol) Distance vector routing protocol that dates from the 1980s.

RIPv1 The first version of RIP, which had several shortcomings, such as a maximum hop count of 15 and a routing table update interval of 30 seconds, which was a problem when every router on a network would send out its table at the same time.

RIPv2 The current version of RIP. Fixed many problems of RIP v1, but the maximum hop count of 15 still applies.

Riser Fire rating that designates the proper cabling to use for vertical runs between floors of a building.

Rivest Cipher 4 (RC4) A popular streaming symmetric-key algorithm.

Rivest Shamir Adleman (RSA) An improved public-key cryptography algorithm that enables secure digital signatures.

RJ (Registered Jack) Connectors used for UTP cable for both telephone and network connections.

RJ-11 Type of connector with four-wire UTP connections; usually found in telephone connections.

RJ-45 Type of connector with eight-wire UTP connections; usually found in network connections and used for 10BaseT networking.

Rlogin Program in UNIX that lets you remotely log into a server. Unlike Telnet, it can be configured to log in automatically.

Rogue Access Point An unauthorized wireless access point (WAP) installed in a computer network.

Role-Based Access Control (RBAC) The most popular authentication model used in file sharing, defines a user's access to a resource based on the roles the user plays in the network environment. This leads to the idea of creation of groups. A group in most networks is nothing more than a name that has clearly defined accesses to different resources. User accounts are placed into various groups.

ROM (Read-Only Memory) The generic term for nonvolatile memory that can be read from but not written to. This means that code and data stored in ROM cannot be corrupted by accidental erasure. Additionally, ROM retains its data when power is removed, which makes it the perfect medium for storing BIOS data or information such as scientific constants.

Root Directory The directory that contains all other directories.

Rootkit A Trojan that takes advantage of very low-level operating system functions to hide itself from all but the most aggressive of anti-malware tools.

ROUTE A command that enables a user to display and edit the local system's routing table.

Router A device that connects separate networks and forwards a packet from one network to another based only on the network address for the protocol being used. For example, an IP router looks only at the IP network number. Routers operate at Layer 3 (Network) of the OSI seven-layer model.

Routing and Remote Access Service (RRAS) A special remote access server program, originally only available on Windows Server, on which a PPTP endpoint is placed in Microsoft networks.

Routing Table A list of paths to various networks required by routers. This can be built either manually or automatically.

RS-232 The recommended standard (RS) upon which all serial communication takes place on a PC.

RSH (Remote Shell) Allows you to send single commands to the remote server. Whereas rlogin is designed to be used interactively, RSH can be easily integrated into a script.

Run A single piece of installed horizontal cabling.

Samba An application that enables UNIX systems to communicate using SMBs (Server Message Blocks). This, in turn, enables them to act as Microsoft clients and servers on the network.

Scalability The capability to support network growth.

Scanner A device that senses alterations of light and dark. It enables the user to import photographs, other physical images, and text into the computer in digital form.

SC Connector One of two special types of fiber-optic cable used in 10BaseFL networks.

Secondary Lookup Zone Backup lookup zones stored on other DNS servers. *See also* Forward Lookup Zones.

Secure Copy Protocol (SCP) One of the first SSH-enabled programs to appear after the introduction of SSH. SCP was one of the first protocols used to transfer data securely between two hosts and thus might have replaced FTP. SCP works well but lacks features such as a directory listing.

Secure FTP (SFTP) Designed as a replacement for FTP after many of the inadequacies of SCP (such as the inability to see the files on the other computer) were discovered.

Secure Hash Algorithm (SHA)
A popular cryptographic hash.

Secure Shell (SSH) A terminal emulation program that looks exactly like Telnet but encrypts the data. SSH has replaced Telnet on the Internet.

Secure Sockets Layer (SSL) A protocol developed by Netscape for transmitting private documents over the Internet. SSL works by using a public key to encrypt sensitive data. This encrypted data is sent over an SSL

connection, and then decrypted at the receiving end using a private key.

Security Log A log that tracks anything that affects security, such as successful and failed logons and logoffs.

Security Policy A set of procedures defining actions employees should perform to protect the network's security.

Segment The bus cable to which the computers on an Ethernet network connect.

Sendmail Currently (2009) the leading e-mail server program.

Sequential A method of storing and retrieving information that requires data to be written and read sequentially. Accessing any portion of the data requires reading all the preceding data.

Server A computer that shares its resources, such as printers and files, with other computers on the network. An example of this is a Network File System Server that shares its disk space with a workstation that has no disk drive of its own.

Server-Based Network A network in which one or more systems function as dedicated file, print, or application servers, but do not function as clients.

Service Set Identification (SSID) A 32-bit identification string, sometimes called a *network name*, that's inserted into the header of each data packet processed by a wireless access point.

Session A networking term used to refer to the logical stream of data flowing between two programs and being communicated over a network. Many different sessions may be emanating from any one node on a network.

Session Initiation Protocol (SIP) VoIP protocol competing with H.323 for VoIP dominance.

Session Layer *See* OSI Seven-Layer Model.

Session Software Handles the process of differentiating between various types of connections on a PC.

SFF (Small Form Factor) A description of later-generation fiber-optic connectors designed to be much smaller than the first iterations of connectors. *See both* LC and MT-RJ (Mechanical Transfer Registered Jack).

Share Level Security A security system in which each resource has a password assigned to it; access to the resource is based on knowing the password.

Share Permissions Permissions that only control the access of other users on the network with whom you share your resource. They have no impact on you (or anyone else) sitting at the computer whose resource is being shared.

Shareware Software that is protected by copyright, but the copyright holder allows (encourages!) you to make and distribute copies, under the condition that those who adopt the software after preview pay a fee. Derivative works are not allowed, and you may make an archival copy.

Shell Generally refers to the user interface of an operating system. A shell is the command processor that is the actual interface between the kernel and the user.

Signaling Topology Another name for logical topology. *See* Logical Topology.

Short Circuit Allows electricity to pass between two conductive elements that weren't designed to interact together. Also called a *short*.

Shortest Path First (SPF) A bridging protocol designed to prevent bridging loops.

Signal Strength A measurement of how well your wireless device is connecting to other devices.

Single-mode Fiber-optic cables that use lasers.

Site Survey A process that enables you to determine any obstacles to creating the wireless network you want.

Smart Device Devices (such as credit cards, USB keys, etc.) that you insert into your PC in lieu of entering a password.

Smart Jack Type of NIU that enables ISPs or telephone companies to test for faults in a network, such as disconnections and loopbacks.

SMB (Server Message Block) Protocol used by Microsoft clients and servers to share file and print resources.

SMTP (Simple Mail Transfer Protocol) The main protocol used to send electronic mail on the Internet.

Snap-Ins Small utilities that can be used with the Microsoft Management Console.

Sneakernet Saving a file on a portable medium and walking it over to another computer.

Sniffer Diagnostic program that can order a NIC to run in promiscuous mode. *See Promiscuous Mode*.

Snip *See* Cable Stripper.

SNMP (Simple Network Management Protocol) A set of standards for communication with devices connected to a TCP/IP network. Examples of these devices include routers, hubs, and switches.

Social Engineering The process of using or manipulating people inside the networking environment to gain access to that network from the outside.

Socket A combination of a port number and an IP address that uniquely identifies a connection.

Socket Pairs *See* Endpoints.

Software Programming instructions or data stored on some type of binary storage device.

Solid Core A cable that uses a single solid wire to transmit signals.

SONET (Synchronous Optical Network) A standard for connecting fiber-optic transmission systems. SONET was proposed in the mid-1980s, and is now an ANSI standard. SONET defines interface standards at the Physical layer of the OSI seven-layer model.

Source NAT A type of NAT in which the source IP addresses get translated by the router.

Spyware A function of any program that sends information about your system or your actions over the Internet.

SQL (Structured Query Language) A language created by IBM that relies on simple English statements to perform database queries. SQL enables databases from different manufacturers to be queried using a standard syntax.

SSL (Secure Sockets Layer) *See* Secure Sockets Layer (SSL).

ST Connector One of two special types of fiber-optic cable used in 10BaseFL networks.

Star-bus Topology A hybrid of the star and bus topologies that uses a physical star, where all nodes connect to a single wiring point such as a hub, and a logical bus that maintains the Ethernet standards. One benefit of a star-bus topology is fault tolerance.

Star-ring Topology A hybrid of the Token Ring topology and the physical star.

Star Topology A network topology in which all computers in the network connect to a central wiring point.

Stateful Describes a DHCPv6 server that works very similarly to an IPv4 DHCP server, passing out IPv6 addresses, subnet masks, and default gateways as well as optional items like DNS server addresses.

Stateful Filtering A method of filtering in which all packets are examined as a stream. Stateful devices can do more than allow or block; they can track when a stream is disrupted or packets get corrupted and act accordingly.

Stateless Describes a DHCPv6 server that only passes out optional information.

Stateless Filtering A method of filtering where the device that does the filtering just checks the packet for IP addresses and port numbers and blocks or allows accordingly.

Static Addressing The process of assigning IP addresses by manually typing them into client computers.

Static NAT (SNAT) A type of NAT that maps a single routable IP address to a single machine, allowing you to access that machine from outside the network.

Static Routing A process by which routers in an internetwork obtain information about paths to other routers. This information must be supplied manually.

Storage A device or medium that can retain data for subsequent retrieval.

STP (Shielded Twisted Pair) A popular cabling for networks composed of pairs of wires twisted around each other at specific intervals. The twists serve to reduce interference (also called *crosstalk*). The more twists, the less interference. The cable has metallic shielding to protect the wires from external interference. Token Ring networks are the only common network technology that uses STP, although Token Ring more often now uses UTP.

STP (Spanning Tree Protocol) Protocol that enables switches to automatically detect and repair bridge loops.

Stranded Core A cable that uses a bundle of tiny wire strands to transmit signals. Stranded core is not quite as good a conductor as solid core, but it will stand up to substantial handling without breaking.

Stream Cipher An encryption method that encrypts a single bit at a time. Popular when data comes in long streams (such as with older wireless networks or cell phones).

Stripe Set Two or more drives in a group that is used for a striped volume.

Structured Cabling Standards defined by the Telecommunications Industry Association/Electronic Industries Alliance (TIA/EIA) that define methods of organizing the cables in a network for ease of repair and replacement.

STS Overhead Carries the signaling and protocol information in Synchronous Transport Signal (STS).

STS Payload Carries data in STS.

Subnet Each independent network in a TCP/IP internetwork.

Subnet Mask The value used in TCP/IP settings to divide the IP address of a host into its component parts: network ID and host ID.

Subnetting Taking a single class of IP addresses and chopping it into multiple smaller groups.

Supplicant A client computer in a RADIUS network.

Switch A device that filters and forwards traffic based on some criteria. A bridge and a router are both examples of switches.

Symmetric DSL (SDSL) Type of DSL connection that provides equal upload and download speed and, in theory, provides speeds up to 15 Mbps, although the vast majority of ISPs provide packages ranging from 192 Kbps to 9 Mbps.

Symmetric-Key Algorithm Any encryption method that uses the same key for both encryption and decryption.

Synchronous Describes a connection between two electronic devices where neither must acknowledge (ACK) when receiving data.

Synchronous Digital Hierarchy (SDH) European fiber carrier standard equivalent to SONET.

Synchronous Optical Network (SONET) American fiber carrier standard.

Synchronous Transport Signal (STS) Signal method used by SONET. It consists of the STS payload and the STS overhead. A number is appended to the end of STS to designate signal speed.

System Log Covers issues dealing with the overall system, such as system services, device drivers, or configuration changes.

System Restore A Windows utility that enables you to return your PC to a recent working configuration when something goes wrong. System Restore returns your computer's system settings to the way they were the last time you remember your system working correctly—all without affecting your personal files or e-mail.

T1 A leased-line connection capable of carrying data at 1,544,000 bps.

T1 Line The specific, shielded, two-pair cabling that connects the two ends of a T1 connection.

T3 Line A leased-line connection capable of carrying data at 44,736,000 bps.

TCP (Transmission Control Protocol) Part of the TCP/IP protocol suite, operates at Layer 4 (Transport) of the OSI seven-layer model. TCP is a connection-oriented protocol.

TCP/IP (Transmission Control Protocol/Internet Protocol) A set of communication protocols developed by the U.S. Department of Defense that enables dissimilar computers to share information over a network.

TDR (Time Domain Reflectometer) Advanced cable tester that tests the length of cables and their continuity or discontinuity, and identifies the location of any discontinuity due to a bend, break, unwanted crimp, and so on.

Telecommunications Room Area where all the cabling from individual PCs in a network runs to.

Telephony The science of converting sound into electrical signals, moving those signals from one location to another, and then converting those signals back into sounds. This includes modems, telephone lines, the

telephone system, and any products used to create a remote access link between a remote access client and server.

Telnet A program that enables users on the Internet to log onto remote systems from their own host systems.

Terminal Access Controller Access Control System Plus (TACACS+) A proprietary protocol developed by Cisco to support AAA in a network with many routers and switches. It is similar to RADIUS in function, but uses TCP port 49 by default and separates authorization, authentication, and accounting into different parts.

Terminal Adapter (TA) The most common interface used to connect a computer to an ISDN line.

Terminal Emulation Software that enables a PC to communicate with another computer or network as if it were a specific type of hardware terminal.

TIA/EIA 568A One of two four-pair UTP crimping standards for 10/100/1000BaseT networks. The other standard is TIA/EIA 568B.

TIA/EIA 568B One of two four-pair UTP crimping standards for 10/100/1000BaseT networks. The other standard is TIA/EIA 568A.

TIA/EIA 606 Official methodology for labeling patch panels.

Ticket-Granting Ticket (TGT) Sent by an Authentication Server in a Kerberos setup if a client's hash matches its own, signaling that the client is authenticated but not yet authorized.

Time Division Multiplexing The process of having frames that carry a bit of every channel in every frame sent on a regular interval in a T1 connection.

Tone Generator *See* Toners.

Tone Probe *See* Toners.

Toners Generic term for two devices used together—a tone generator and a tone locator (probe)—to trace cables by sending an electrical signal along a wire at a particular frequency. The tone locator then emits a sound when it distinguishes that frequency. Also referred to as *Fox and Hound*.

Top-Level Domain Servers A set of DNS servers—just below the root servers—that handle the top-level domain names, such as .com, .org, .net, and so on.

Topology The pattern of interconnections in a communications system among devices, nodes, and associated input and output stations. Also describes how computers connect to each other without regard to how they actually communicate.

Toredo A NAT-traversal IPv6 tunneling protocol, built into Microsoft Windows.

TRACERT (also TRACEROUTE) A command-line utility used to follow the path a packet takes between two hosts.

Traffic Shaping Controlling the flow of packets into or out from the network according to the type of packet or other rules.

Transceiver The device that transmits and receives signals on a cable.

Transmit Beamforming A multiple-antenna technology in 802.11n WAPs that helps get rid of dead spots.

Transport Layer *See* OSI Seven-Layer Model.

Transport Layer Security A robust update to SSL that works with almost any TCP application.

Trivial File Transfer Protocol (TFTP) A protocol that transfers files between servers and clients. Unlike FTP, TFTP requires no user login. Devices that need an operating system, but have no local hard disk (for example, diskless workstations and routers), often use TFTP to download their operating systems.

Trojan A virus that masquerades as a file with a legitimate purpose, so that a user will run it intentionally. The classic example is a file that runs a game, but also causes some type of damage to the player's system.

Trunk Port A port on a switch configured to carry all data, regardless of VLAN number, between all switches in a LAN.

Trunking The process of transferring VLAN data between two or more switches.

Tunnel An encrypted link between two programs on two separate computers.

Tunnel Broker In IPv6, creates the actual tunnel and (usually) offers a custom-made endpoint client for you to use, although more advanced users can often make a manual connection.

Tunnel Information and Control Protocol (TIC) One of the protocols that set up IPv6 tunnels and handle configuration as well as login.

Tunnel Setup Protocol (TSP) One of the protocols that set up IPv6 tunnels and handle configuration as well as login.

Twisted Pair Twisted pairs of cables, the most overwhelmingly common type of cabling used in networks. The two types of twisted pair cabling are UTP (unshielded twisted pair) and STP (shielded twisted pair). The twists serve to reduce interference, called *crosstalk*; the more twists, the less crosstalk.

U (Units) The unique height measurement used with equipment racks; 1 U equals 1.75 inches.

UART (Universal Asynchronous Receiver/Transmitter) A device that turns serial data into parallel data. The cornerstone of serial ports and modems.

UDP (User Datagram Protocol) Part of the TCP/IP protocol suite, a connectionless protocol that is an alternative to TCP.

UNC (Universal Naming Convention) Describes any shared resource in a network using the convention \\<*server name*>\<*name of shared resource*>.

Unicast A message sent from one computer to one other computer.

Unicast Address A unique IPv6 address that is exclusive to that system. Link-local addresses are unicast addresses.

Universal Asynchronous Receiver Transmitter (UART) A device inside a modem that takes the 8-bit-wide digital data and converts it into 1-bit-wide digital data and hands it to the modem for conversion to analog data. The process is reversed for incoming data.

UNIX A popular computer software operating system used on many Internet host systems.

Uplink Port Port on a hub that enables you to connect two hubs together using a straight-through cable.

Upload The transfer of information from a user's system to a remote computer system. Opposite of download.

UPS (Uninterruptible Power Supply) A device that supplies continuous clean power to a computer system the whole time the computer is on. Protects against power outages and sags. The term *UPS* is often used mistakenly when people mean SPS (Stand-by Power Supply or System).

URL (Uniform Resource Locator) An address that defines the type and the location of a resource on the Internet. URLs are used in almost every TCP/IP application. A typical HTTP URL is http://www.totalsem.com.

Usenet The network of UNIX users, generally perceived as informal and made up of loosely coupled nodes, that exchanges mail and messages. Started by Duke University and UNC-Chapel Hill. An information cooperative linking around 16,000 computer sites and millions of people. Usenet provides a series of "news groups" analogous to online conferences.

User Anyone who uses a computer. You.

User Account A container that identifies a user to the application, operating system, or network, including name, password, user name, groups to which the user belongs, and other information based on the user and the OS or NOS being used. Usually defines the rights and roles a user plays on a system.

User Datagram Protocol (UDP) A protocol used by some older applications, most prominently TFTP (Trivial FTP), to transfer files. UDP packets are both simpler and smaller than TCP packets, and they do most of the behind-the-scenes work in a TCP/IP network.

User-Level Security A security system in which each user has an account, and access to resources is based on user identity.

User Profiles A collection of settings that corresponds to a specific user account and may follow the user, regardless of the computer at which he or she logs on. These settings enable the user to have customized environment and security settings.

UTP (Unshielded Twisted Pair) A popular cabling for telephone and networks composed of pairs of wires

twisted around each other at specific intervals. The twists serve to reduce interference (also called *crosstalk*). The more twists, the less interference. The cable has *no* metallic shielding to protect the wires from external interference, unlike its cousin, *STP*. 10BaseT uses UTP, as do many other networking technologies. UTP is available in a variety of grades, called categories, as defined in the following:

- **Category 1 UTP** Regular analog phone lines, not used for data communications
- **Category 2 UTP** Supports speeds up to 4 Mbps
- **Category 3 UTP** Supports speeds up to 16 Mbps
- **Category 4 UTP** Supports speeds up to 20 Mbps
- **Category 5 UTP** Supports speeds up to 100 Mbps
- **Category 5e UTP** Supports speeds up to 100 Mbps with two pairs and up to 1000 Mbps with four pairs
- **Category 6 UTP** Improved support for speeds up to 1000 Mbps

V Standards Standards established by CCITT for modem manufacturers to follow (voluntarily) to ensure compatible speeds, compression, and error correction.

V.92 Standard The current modem standard, which has a download speed of 57,600 bps and an upload speed of 48 Kbps. V.92 modems have several interesting features, such as Quick Connect and Modem on Hold.

Vertical Cross-Connect Main patch panel in a telecommunications room. *See also* Patch Panel.

Very High Bitrate DSL (VDSL) The latest form of DSL with download and upload speeds of up to 100 Mbps. VDSL was designed to run on copper phone lines, but many VDSL suppliers use fiber-optic cabling to increase effective distances.

Virtual Local Area Network (VLAN) A LAN that, using VLAN-capable switches, places some (or any on the more expensive VLANs) systems on virtual broadcast domains.

Virus A program that can make a copy of itself without you necessarily being aware of it. Some viruses can destroy or damage files, and generally the best protection is always to maintain backups of your files.

Virus Definition or Data Files Enable the virus protection software to recognize the viruses on your system and clean them. These files should be updated often. Also called *signature files*, depending on the virus protection software in use.

Voice over IP (VoIP) Using an IP network to transfer voice calls.

Voltage The pressure of the electrons passing through a wire.

Voltage Event Recorder Tracks voltage over time by plugging into a power outlet.

Volts (V) Units of measurement for *voltage*.

VPN (Virtual Private Network) A network configuration that enables a remote user to access a private network via the Internet. VPNs employ an encryption methodology called *tunneling*, which protects the data from interception.

WAN (Wide Area Network) A geographically dispersed network created by linking various computers and LANs over long distances, generally using leased phone lines. There is no firm dividing line between a WAN and a LAN.

Warm Boot A system restart performed after the system has been powered and operating. This clears and resets the memory, but does not stop and start the hard drive.

Wattage (Watts or W) The amount of amps and volts needed by a particular device to function.

Web Server A server that enables access to HTML documents by remote users.

Well-Known Port Numbers Port numbers from 0 to 1204 that are used primarily by client applications to talk to server applications in TCP/IP networks.

Wi-Fi The most widely adopted wireless networking type in use today. Technically, only wireless devices that conform to the extended versions of the 802.11 standard—802.11a, 802.11b, and 802.11g—are Wi-Fi certified.

Wi-Fi Protected Access (WPA) A wireless security protocol that addresses the weaknesses and acts as a sort of upgrade to WEP. WPA offers security enhancements

such as dynamic encryption key generation (keys are issued on a per-user and per-session basis), an encryption key integrity-checking feature, user authentication through the industry-standard Extensible Authentication Protocol (EAP), and other advanced features that WEP lacks.

Wi-Fi Protected Access 2 (WPA2) An update to the WPA protocol that uses the Advanced Encryption Standard algorithm, making it much harder to crack.

WiMax *See* 802.16.

Windows Domain A group of computers controlled by a computer running Windows Server, which is configured as a domain controller.

Windows Firewall The firewall that has been included in Windows operating systems since Windows XP; originally named Internet Connection Firewall (ICF), but was renamed in XP Service Pack 2.

WINIPCFG A graphical program used on Windows 95, Windows 98, and Windows Me machines to display the current TCP/IP configuration of the machine; similar to more modern Windows's IPCONFIG and UNIX/Linux's IFCONFIG.

WINS (Windows Internet Name Service) A name resolution service that resolves NetBIOS names to IP addresses.

WINS Proxy Agent A WINS relay agent that forwards WINS broadcasts to a WINS server on the other side of a router to keep older systems from broadcasting in place of registering with the server.

Wireless Access Point (WAP) Connects wireless network nodes to wireless or wired networks. Many WAPs are combination devices that act as high-speed hubs, switches, bridges, and routers, all rolled into one.

Wireless Bridge Device used to connect two wireless network segments together, or to join wireless and wired networks together in the same way that wired bridge devices do.

Wireless Equivalency Privacy (WEP) A wireless security protocol that uses a 64-bit encryption algorithm to scramble data packets.

Wireless Network *See* Wi-Fi.

Wiremap Term that techs use to refer to the proper connectivity of wires in a network.

Wireshark A popular packet sniffer.

Wiring Diagram A document, also known as a *wiring schematic*, that usually consists of multiple pages, shows how the wires in a network connect to switches and other nodes, what types of cable are used, and how patch panels are configured, and usually includes details about each and every cable run.

Wiring Schematic *See* Wiring Diagram.

Work Area In a basic structured cabling network, often simply an office or cubicle that potentially contains a PC attached to the network.

Workgroup A convenient method of organizing computers under Network/My Network Places in Windows operating systems.

Workstation A general-purpose computer that is small enough and inexpensive enough to reside at a person's work area for his or her exclusive use.

Worm A very special form of virus. Unlike other viruses, a worm does not infect other files on the computer. Instead, it replicates by making copies of itself on other systems on a network by taking advantage of security weaknesses in networking protocols.

WWW (World Wide Web) The (graphical) Internet that can be accessed using Gopher, FTP, HTTP, Telnet, USENET, WAIS, and some other tools.

X.25 The first generation of packet-switching technology, enables remote devices to communicate with each other across high-speed digital links without the expense of individual leased lines.

Yost Cable Cable used to interface with a Cisco device.

Zombie A single computer under the control of an operator that is used in a botnet attack. *See also* Botnet.