# Glossary

***AppleTalk:***

A communications protocol developed by Apple Computer to allow networking between Macintoshes. All Macintosh computers have a LocalTalk port, running AppleTalk over a 230K bps serial line. AppleTalk also runs over Ethernet (EtherTalk) and Token Ring (TokenTalk) network media.

***Auto-Negotiate:***

Clause 28 of the IEEE 802.3u standard specifies a MAC sublayer for the identification of the speed and duplex mode of connection being supported by a device. Support of this feature is optional for individual vendors.

***Auto-sense:***

Ability of a 10/100 Ethernet device to interpret the speed or duplex mode of the attached device and to adjust to that rate. Official term is Auto-Negotiation in Clause 28 of the IEEE 802.3u standard.

***AUI:***

Attachment Unit Interface. A 15-pin shielded, twisted pair Ethernet cable used (optionally) to connect between network devices and a MAU.

***Autobaud:***

Automatic determination and matching of transmission speed.

***AWG:***

American Wire Gauge. A system that specifies wire size. The gauge varies inversely with the wire diameter size.

***Backbone:***

The main cable in a network.

***Bandwidth on Demand:***

Feature that allows a remote access device to initiate a second connection to a particular site to increase the amount of data transferred to that site to increase the desired threshold. The network manager configuring the remote access server will specify a number of bits or a percentage of connection bandwidth threshold which will trigger the secondary connection. Multilink PPP is an emerging standard to allow this feature to be interoperable, but right now the only way to ensure correct operation is to use devices on both end from the same vendor.

***Baseband LAN:***

A LAN that uses a single carrier frequency over a single channel. Ethernet, Token Ring and Arcnet LANs use baseband transmission.

***Baud:***

Unit of signal frequency in signals per second. Not synonymous with bits per second since signals can represent more than one bit. Baud equals bits per second only when the signal represents a single bit.

***Binaries:***

Binary, machine readable forms of programs that have been compiled or assembled. As opposed to Source language forms of programs.

***Binary:***

Characteristic of having only two states, such as current on and current off. The binary number system uses only ones and zeros.

***Bitronics:***

Specification for parallel printing which allows bidirectional communication on a Centronics-type interface. Pioneered by Hewlett-Packard, mainly used for postscript printers.

***Bit:***

The smallest unit of data processing information. A bit (or binary digit) assumes the value of either 1 or 0.

***BNC:***

A standardized connector used with Thinnet and coaxial cable.

***BOOTP:***

A TCP/IP network protocol that lets network nodes request configuration information from a BOOTP "server" node.

***bps:***

Bits per second, units of transmission speed.

***Bridge:***

A networking device that connects two LANs and forwards or filters data packets between them, based on their destination addresses. Bridges operate at the data link level (or MAC-layer) of the OSI reference model, and are transparent to protocols and to higher level devices like routers.

***Broadband:***

A data transmission technique allowing multiple high-speed signals to share the bandwidth of a single cable via frequency division multiplexing.

***Broadband Network:***

A network that uses multiple carrier frequencies to transmit multiplexed signals on a single cable. Several networks may coexist on a single cable without interfering with one another.

***Brouter:***

A device that routes specific protocols, such as TCP/IP and IPX, and bridges other protocols, thereby combining the functions of both routers and bridges.

***Bus:***

A LAN topology in which all the nodes are connected to a single cable. All nodes are considered equal and receive all transmissions on the medium.

***Byte:***

A data unit of eight bits.

***Channel:***

The data path between two nodes.

***CHAP:***

(Challenge Handshake Authentication Protocol) Authentication scheme for PPP where the password not only is required to begin connection but also is required during the connection - failure to provide correct password during either login or challenge mode will result in disconnect.

***Coaxial Cable:***

An electrical cable with a solid wire conductor at its center surrounded by insulating materials and an outer metal screen conductor with an axis of curvature coinciding with the inner conductor -

hence "coaxial." Examples are standard Ethernet cable and Thinwire Ethernet cable.

***Collision:***

The result of two network nodes transmitting on the same channel at the same time. The transmitted data is not usable.

***Collision Detect:***

A signal indicating that one or more stations are contending with the local station's transmission. The signal is sent by the Physical layer to the Data Link layer on an Ethernet/IEEE 802.3 node.

***Communication Server:***

A dedicated, standalone system that manages communications activities for other computers.

***Console:***

The terminal used to configure network devices at boot (start-up) time.

***Crosstalk:***

Noise passed between communications cables or device elements.

***Cut-through:***

Technique for examining incoming packets whereby an Ethernet switch looks only at the first few bytes of a packet before forwarding or filtering it. This process is faster than looking at the whole packet, but it also allows some bad packets to be forwarded.

***CSMA/CD:***

Carrier Sense Multiple Access with Collision Detection is the Ethernet media access method. All network devices contend equally for access to transmit. If a device detects another device's signal while it is transmitting, it aborts transmission and retries after a brief pause.

***Data Link:***

A logical connection between two nodes on the same circuit.

***Data Link Layer:***

Layer 2 of the seven-layer OSI reference model for communication between computers on networks. This layer defines protocols for data packets and how they are transmitted to and from each network device. It is a medium-independent, link-level communications facility on top of the Physical layer, and is divided into two sublayers: medium-access control (MAC) and logical-link control (LLC).

***DECnet™:***

Digital Equipment Corporation (DEC) proprietary network architecture, a system for networking computers. It runs on point-to-point, X.25 and Ethernet networks.

***Dial on Demand:***

When a router detects the need to initiate a dial-up connection to a remote network, it does so automatically according to pre-defined parameters set by the network manager.

***Dialback:***

A security feature that ensures people do not log into modems that they shouldn't have access to. When a connection is requested, the system checks the user name for validity, then "dials back" the number associated with that user name.

***Distributed Processing:***

A system in which each computer or node in the network performs its own processing and manages some of its data while the network facilitates communications between the nodes.

***Domain Name:***

A domain name is a text name appended to a host name to form a unique host name across internets.

***Download:***

The transfer of a file or information from one network node to another. Generally refers to transferring a file from a "big" node, such as a computer, to a "small" node, such as a terminal server or printer.

***End Node:***

A node such as a PC that can only send and receive information for its own use. It cannot route and forward information to another node.

***Ethernet:***

The most popular LAN technology in use today. The IEEE standard 802.3 defines the rules for configuring an Ethernet network. It is a 10 Mbps, CSMA/CD baseband network that runs over thin coax, thick coax, twisted pair or fiber optic cable.

***EtherTalk:***

Apple Computer's protocol for Ethernet transmissions.

***FDDI:***

Fiberoptic Data Distribution Interface. A cable interface capable of transmitting data at 100 Mbps. Originally specified for fiber lines, FDDI can also operate over twisted-pair cable for short distances.

***Fiber-Optic Cable:***

A transmission medium composed of a central glass optical fiber cable surrounded by cladding and an outer protective sheath. It transmits digital signals in the form of modulated light from a laser or LED (light-emitting diode).

***File Server:***

A computer that stores data for network users and provides network access to that data.

***Filtering:***

Process whereby an Ethernet switch or bridge reads the contents of a packet and then finds that the packet does not need to be forwarded, drops it. a filtering rate is the rate at which a device can receive packets and drop them without any loss of incoming packets or delay in processing.

***Firmware:***

Alterable programs in semipermanent storage, e.g., some type of read-only or flash reprogrammable memory.

***Forwarding:***

Process whereby an Ethernet switch or bridge reads the contents of a packet and then passes that packet on to the appropriate attached segment. A forwarding rate is the time that it takes the device to execute all of the steps.

***Flash ROM:***

See ROM.

***Framing:***

Dividing data for transmission into groups of bits, and adding a header and a check sequence to form a frame.

***FTP:***

File Transfer Protocol, a TCP/IP protocol for file transfer.

***Full-Duplex:***

Independent, simultaneous two-way transmission in both directions, as opposed to half-duplex transmission.

***Gateway:***

A device for interconnecting two or more dissimilar networks. It can translate all protocol levels from the Physical layer up through the Applications layer of the OSI model, and can therefore interconnect entities that differ in all details.

***Hardware Address:***

See Network Address.

***Header:***

The initial part of a data packet or frame containing identifying information such as the source of the data, its destination, and length.

***Heartbeat:***

Ethernet defined SQE signal quality test function.

***Hertz (Hz):***

A frequency unit equal to one cycle per second.

***Host:***

Generally a node on a network that can be used interactively, i.e., logged into, like a computer.

***Host Table:***

A list of TCP/IP hosts on the network along with their IP addresses.

***IEEE 802.3:***

The IEEE (Institute of Electrical and Electronic Engineers) standard that defines the CSMA/CD media-access method and the physical and data link layer specifications of a local area network. Among others, it includes 10BASE2, 10BASE5, 10BASE-FL and 10BASE-T Ethernet implementations.

***Internet:***

A series of interconnected local, regional, national and international networks, linked using TCP/IP. Internet links many government, university and research sites. It provides E-mail, remote login and file transfer services.

***Internetworking:***

General term used to describe the industry composed of products and technologies used to link networks together.

***IP Address:***

See Network Address.

***IPX:***

Internetwork Packet eXchange, a NetWare protocol similar to IP (Internet Protocol).

***ISDN:***

(Integrated Services Digital Network): All digital service provided by telephone companies. Provides 144K bps over a single phone line (divided in two 64K bps "B" channels and one 16K bps "D" channel).

***ISO Layered Model:***

The International Standards Organization (ISO) sets standards for computers and communications. Its Open Systems Interconnection (OSI) reference model specifies how dissimilar computing devices such as Network Interface Cards (NICs), bridges and routers exchange data over a network. The model consists of seven layers. From lowest to highest, they are: Physical, Data Link, Network, Transport, Session, Presentation and Application. Each layer performs services for the layer above it.

***Jabber:***

Network error caused by an interface card placing corrupted data on the network. Or, an error condition due to an Ethernet node transmitting longer packets than allowed.

***Kbps:***

Kilobits per second.

***Kermit:***

A popular file transfer and terminal emulation program.

***LAN:***

Local Area Network, a data communications system consisting of a group of interconnected computers, sharing applications, data and peripherals. The geographical area is usually a building or group of buildings.

***LAT:***

Local Area Transport, a Digital Equipment Corporation proprietary network communication protocol. The protocol is based on the idea of a relatively small, known number of hosts on a local network sending small network packets at regular intervals. LAT will not work on a wide area network scale, as TCP/IP does.

***Latency:***

The delay incurred by a switching or bridging device between receiving the frame and forwarding the frame.

***Layer:***

In networks, layers refer to software protocol levels comprising the architecture, with each layer performing functions for the layers above it.

***Line Speed:***

Expressed in bps, the maximum rate at which data can reliably be transmitted over a line using given hardware.

***Load Balancing:***

Shifting a user job from a more heavily loaded resource to a less loaded resource.

***Local Network Interconnect (LNI):***

A Port Multiplier, or concentrator supporting multiple active devices or communications controllers, either used standalone or attached to standard Ethernet cable.

***LocalTalk:***

Apple Computer’s proprietary 230 Kbps baseband network protocol. It uses the CSMA/CD access method over unshielded twisted pair wire.

***Logical Link:***

A temporary connection between source and destination nodes, or between two processes on the same node.

***LPD:***

Line Printer Daemon, a process on Berkeley spooler implementations that provides LPR support.

***LPR:***

The LPR command is used to queue print jobs on Berkeley queuing systems.

***MAU:***

Medium Attachment Unit, a device used to convert signals from one Ethernet medium to another.

***Mbps:***

Megabits per second.

***MIB:***

Management Information Base, a database of network parameters used by SNMP and CMIP (Common Management Information Protocol) to monitor and change network device settings. It provides a logical naming of all information resources on the network that are pertinent to the network's management.

***MII:***

Media Independent Interface, New standard developed for Fast Ethernet in IEEE 802.3u specification. The Fast Ethernet equivalent to the AUI in 10 Mbps Ethernet, allowing different types of Fast Ethernet media to be connected to a Fast Ethernet device via a common interface.

***MJ:***

Modular Jack. A jack used for connecting voice cables to a faceplate, as for a telephone.

***MMJ:***

Modified Modular Jack. These are the 6-pin connectors used to connect serial terminal lines to terminal devices. MMJs can be distinguished from the similar RJ12 jacks by having a side-locking tab, rather than a center-mounted one.

***Modem:***

A modulator-demodulator device for changing transmission signals from digital to analog for transmission over phone lines. Used in pairs, one is required at each end of the line.

***MOP:***

Maintenance Operations Protocol, a DEC protocol used for remote communications between hosts and servers.

***Multicast:***

A multicast is a message that is sent out to multiple devices on the network by a host.

***Multilink PPP:***

The ability of a dialup device to allocate more than one channel of bandwidth to a particular connection. Generally, this is termed to be the ability of an ISDN device to bond two B-channels together into a single data pipe, but some vendors can perform the same function with asychronous dial-up connections over modems by having a second connection initiated to support the additional bandwidth requirements.

***Multiplexer:***

A device that allows several users to share a single circuit. It funnels different data streams into a single stream. At the other end of the communications link, another multiplexer reverses the process by splitting the data stream back into the original streams.

***Multiplexing:***

Transmitting multiple signals simultaneously on a single channel.

***Multiport Repeater:***

A repeater, either standalone or connected to standard Ethernet cable, for interconnecting up to eight Thinwire Ethernet segments.

***Name Server:***

Software that runs on network hosts charged with translating (or resolving) text-style names into numeric IP addresses.

***NCP:***

Network Control Program, a program run on VMS machines to configure local network hardware and remote network devices.

***NetWare:***

A Novell developed Network Operating System (NOS). Provides file and printer sharing among networks of Personal Computers (PCs). Each NetWare network must have at least one file server, and access to other resources is dependent on connecting to and logging into the file server. The file server controls user logins and access to other network clients, such as user PCs, print servers, modem/fax servers, disk/file servers, etc.

***NetBIOS/NetBEUI:***

Microsoft’s networking protocols for it’s LAN Manager and Windows NT products.

***Network:***

An interconnected system of computers that can communicate with each other and share files, data and resources.

***Network Address:***

Every node on a network has one or more addresses associated with it, including at least one fixed hardware address such as "ae-34-2c-1d-69-f1" assigned by the device's manufacturer. Most nodes also have protocol specific addresses assigned by a network manager.

***Network Management:***

Administrative services for managing a network, including configuring and tuning, maintaining network operation, monitoring network performance, and diagnosing network problems.

***NIC:***

Network Interface Card, an adapter card that is inserted into a computer, and contains the necessary software and electronics to enable the station to communicate over the network.

***Node:***

Any intelligent device connected to the network. This includes terminal servers, host computers, and any other devices (such as printers and terminals) that are directly connected to the network. A node can be thought of as any device that has a "hardware address."

***NOS:***

Network Operating System, the software for a network that runs in a file server and controls access to files and other resources from multiple users. It provides security and administrative tools. Novell's NetWare, Banyan's VINES and IBM's LAN Server are NOS examples.

***Open System Interconnect (OSI):***

See "ISO."

***Packet:***

A series of bits containing data and control information, including source and destination node addresses, formatted for transmission from one node to another.

***PAP:***

(Password Authentication Protocol) Authentication scheme for PPP links. A password can be specified for both devices on a remote link. Failure to authenticate will result in a dropped connection prior to start of data transmission.

***Physical Address:***

An address identifying a single node.

***Physical Layer:***

Layer 1, the bottom layer of the OSI model, is implemented by the physical channel. The Physical layer insulates Layer 2, the Data Link layer, from medium-dependent physical characteristics such as baseband, broadband or fiber-optic transmission. Layer 1 defines the protocols that govern transmission media and signals.

***Point-to-Point:***

A circuit connecting two nodes only, or a configuration requiring a separate physical connection between each pair of nodes.

***Port:***

The physical connector on a device enabling the connection to be made.

***Port Multiplier:***

A concentrator providing connection to a network for multiple devices.

***PostScript:***

A printer/display protocol developed by Adobe Corp. PostScript is an actual printing and programming language to display text and graphics. Unlike line/ASCII printers, which print character input verbatim, PostScript printers accept and interpret an entire PostScript page before printing it.

***PPP:***

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

***Print Server:***

A dedicated computer that manages printers and print requests from other nodes on the network.

***PROM:***

Programmable ROM, a read-only memory whose data content can be altered.

***Protocol:***

Any standard method of communicating over a network.

***Remote Access:***

Access to network resources not located on the same physical Ethernet. (Physical Ethernet here refers to an entire site network topology.)

***Remote Control:***

Form of remote access where a device dialing in assumes control of another network node - all keystrokes on the remote are translated into keystrokes on the network node. Used primarily with IPX protocol.

***Remote Node:***

Form of remote access where the device dialing in acts as a peer on the target network. Used with both IP and IPX protocols.

***Repeater:***

A repeater is a network device that repeats signals from one cable onto one or more other cables, while restoring signal timing and waveforms.

***Ring:***

A network topology in which the nodes are connected in a closed loop. Data is transmitted from node to node around the loop, always in the same direction.

***RMON:***

SNMP-based standard for reporting various network conditions. RMON has 10 different management groups which provide detailed information about a network.

***Rlogin:***

Rlogin is an application that provides a terminal interface between UNIX hosts using the TCP/IP network protocol. Unlike Telnet, Rlogin assumes the remote host is (or behaves like) a UNIX machine

***ROM:***

Read-Only Memory, a memory device that retains its information even when power to it is removed. A ROM version of a network device does not need to download, since the ROM contains the entire executable code and thus never needs to reload it. Frequently the ROM is provided as "flash ROM", which can be reprogrammed by downloading if the user chooses.

***Router:***

Device capable of filtering/forwarding packets based upon data link layer information. Whereas a bridge or switch may only read MAC layer addresses to filter, routers are able to read data such as IP addresses and route accordingly.

***RTEL:***

Lantronix' "reverse Telnet" software allows hosts using TCP/IP to establish a session with a device attached to a terminal server port.

***Server:***

A computer that provides resources to be shared on the network, such as files (file server) or terminals (terminal server).

***Session:***

A connection to a network service.

***Shared Ethernet:***

Ethernet configuration in which a number of segments are bound together in a single collision domain. Hubs produce this type of configuration where only one node can transmit at a time.

***SLIP:***

Serial Line Internet Protocol, a protocol for running TCP/IP over serial lines.

***SNA:***

Systems Network Architecture. IBM’s layered protocols for mainframe communications.

***SNMP:***

Simple Network Management Protocol, allows a TCP/IP host running an SNMP application to query other nodes for network-related statistics and error conditions. The other hosts, which provide SNMP agents, respond to these queries and allow a single host to gather network statistics from many other network nodes.

***Source Code:***

Programs in an uncompiled or unassembled form.

***Spanning Tree:***

An algorithm used by bridges to create a logical topology that connects all network segments, and ensures that only one path exists between any two stations.

***Store and Forward:***

Technique for examining incoming packets on an Ethernet switch or bridge whereby the whole packet is read before forwarding or filtering takes place. Store and forward is a slightly slower process than cut-through, but it does ensure that all bad or misaligned packets are eliminated from the network by the switching device.

***SPX:***

Sequential Packet exchange. Novell’s implementation of SPP (Sequential Packet Protocol).

***SQE:***

Ethernet-defined signal quality test function, frequently called "heartbeat."

***Switch:***

Multiport Ethernet device designed to increase network performance by allowing only essential traffic on the attached individual Ethernet segments. Packets are filtered or forwarded based upon their source and destination addresses.

***T-Connector:***

A T-shaped device with two female and one male BNC connectors.

***TCP/IP:***

Transmission Control Protocol (TCP) and Internet Protocol (IP) are the standard network protocols in UNIX environments. They are almost always implemented and used together and called TCP/IP.

***Telnet:***

Telnet is an application that provides a terminal interface between hosts using the TCP/IP network protocol. It has been standardized so that "telnetting" to any host should give one an interactive terminal session, regardless of the remote host type or operating system. Note that this is very different from the LAT software, which allows only local network access to LAT hosts only.

***10BASE2:***

Ethernet running on thin coax network cable.

***10BASE5:***

Ethernet running on Thickwire network cable.

***10BASE-T:***

Ethernet running on unshielded twisted pair (UTP) cable. Note that 10BASE-T is a point-to-point network media, with one end of the cable typically going to a repeater/hub and the other to the network device.

***Terminal Server:***

A concentrator that facilitates communication between hosts and terminals.

***Terminator:***

Used on both ends of a standard Ethernet or Thinwire Ethernet segment, this special connector provides the 50 ohm termination resistance needed for the cable.

***TFTP:***

Trivial File Transfer Protocol. On computers that run the TCP/IP networking software, TFTP is used to quickly send files across the network with fewer security features than FTP.

***Thickwire:***

Half-inch diameter coax cable.

***Thinwire:***

Thin coaxial cable similar to that used for television/video hookups.

***Throughput:***

The amount of data transmitted between two points in a given amount of time, e.g., 10 Mbps.

***Token:***

The character sequence or frame, passed in sequence from node to node, to indicate that the node controlling it has the right to transmit for a given amount of time.

***Token Ring:***

Developed by IBM, this 4 or 16 Mbps network uses a ring topology and a token-passing access method.

***Topology:***

The arrangement of the nodes and connecting hardware that comprises the network. Types include ring, bus, star and tree.

***Transceiver:***

The actual device that interfaces between the network and the local node. The term generally refers to any connector, such as a MAU, that actively converts signals between the network and the local node.

***Transceiver Cable:***

Cable that attaches a device either to a standard or thin coax Ethernet segment.

***Twisted-Pair Cable:***

Inexpensive, multiple-conductor cable comprised of one or more pairs of 18 to 24 gauge copper strands. The strands are twisted to improve protection against electromagnetic and radio frequency interference. The cable, which may be either shielded or unshielded, is used in low-speed communications, as telephone cable. It is used only in baseband networks because of its narrow bandwidth.

***Unix:***

A multitasking, multiuser computer operating system developed by AT&T. Several versions exist, e.g., the Berkeley version.

***UTP:***

Unshielded twisted pair, one or more cable pairs surrounded by insulation. UTP is commonly used as telephone wire.

***Wide Area Network (WAN):***

A network using common carrier transmission services for transmission of data over a large geographical area.

***Workgroup Switching:***

Configuration in which a number of users are connected to an Ethernet network via a switch. Switching allows each user to get greater throughput than would be available through a hub.

***X.25 Gateway Access Protocol:***

Allows a node not directly connected to a public data network to access the facilities of that network through an intermediary gateway node. X.25 is the protocol standard governing packet-switched networks.

Ethernet Tutorial, Networking Basics

Ethernet Tutorial, Adding Speed

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