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A

Apple Events *n.* A feature added to Mac OS System 7 that enables one application to send a command, such as save or open, to another application. *See also* Mac OS.

Apple Extended Keyboard *n.* A 105-key keyboard that works with the Macintosh SE, Macintosh II, and Apple IIGS computers. This keyboard marks Apple's first inclusion of function (F) keys, whose absence was long cited as a shortcoming of the Macintosh compared with IBM PCs and compatibles. This feature, along with other layout changes and the addition of new keys and lights, makes the Apple Extended Keyboard quite similar in form to the IBM enhanced keyboard. *See the illustration. See also* enhanced keyboard.

Apple II *n.* The second computer introduced by the Apple Computer Corporation, in April 1977. The Apple II featured 4K dynamic RAM, expandable to 48K (with 16K chips), and used the 6502 microprocessor. The Apple II was the first computer to offer a TV video adapter as an optional alternative to a color computer monitor. It also featured sound and eight expansion slots. *See also* 6502.

Apple key *n.* A key on Apple keyboards labeled with an outline of the Apple logo. On the Apple Extended Keyboard, this key is the same as the Command key, which functions similarly to the Control key on IBM and compatible keyboards. It is generally used in conjunction with a character key as a shortcut to making menu selections or starting a macro.

Apple Macintosh *n.* *See* Macintosh.

Apple Newton *n.* *See* Newton.

AppleScript *n.* A script language developed by Apple Computer, Inc., for Macintosh computers running under the Mac OS to execute commands and automate functions. *See also* script.

AppleShare *n.* A file server software developed by Apple Computer, Inc., that works with the Mac OS and allows one Macintosh computer to share files with another on the same network. *See also* file server, Mac OS.

applet \a'plət\ *n.* A program that can be downloaded over the Internet and executed on the recipient's machine. Applets are often written in the Java programming language and run within browser software, and they are typically used to customize or add interactive elements to a Web page.

AppleTalk *n.* An inexpensive local area network developed by Apple Computer, Inc., for Macintosh computers that can be used by Apple and non-Apple computers to communicate and share resources such as printers and file servers. Non-Apple computers must be equipped with AppleTalk hardware and suitable software. The network uses a layered set of protocols similar to the ISO/OSI reference model and transfers information in the form of packets called frames. AppleTalk supports connections to other AppleTalk networks through devices known as bridges, and it supports connections to dissimilar networks through devices called gateways. *See also* bridge, frame (definition 2), gateway.

application *n.* A program designed to assist in the performance of a specific task, such as word processing, accounting, or inventory management. *Compare* utility.



Apple Extended Keyboard.

B

bandwidth *n.* **1.** The difference between the highest and lowest frequencies that an analog communications system can pass as measured in Hertz (Hz) or cycles per second. For example, a telephone accommodates a bandwidth of 3,000 Hz: the difference between the lowest (300 Hz) and highest (3,300 Hz) frequencies it can carry. **2.** The data transfer capacity, or speed of transmission, of a digital communications system as measured in bits per second (bps).

bandwidth on demand *n.* In telecommunications, the capability of increasing throughput, in increments, as required by the channel to be serviced. *See also* bandwidth, channel (definition 2), throughput.

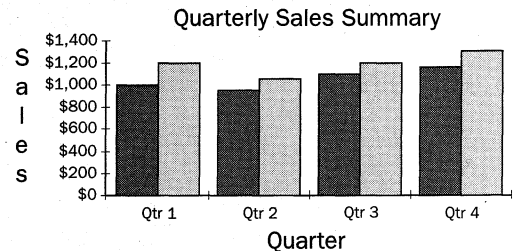
bank *n.* **1.** Any group of similar electrical devices connected together for use as a single device. For example, transistors may be connected in a row/column array inside a chip to form memory, or several memory chips may be connected together to form a memory module such as a SIMM. *See also* SIMM. **2.** A section of memory, usually of a size convenient for a CPU to address. For example, an 8-bit processor can address 65,536 bytes of memory; therefore, a 64-kilobyte (64-KB) memory bank is the largest that the processor can address at once. To address another 64-KB bank of memory requires circuitry that fools the CPU into looking at a separate block of memory. *See also* bank switching, page (definition 2).

bank switching *n.* A method of expanding a computer's available random access memory (RAM) by switching between banks of RAM chips that share a range of memory addresses, which is set aside before switching begins. Only one bank is directly accessible at a time; when a bank is not active, it retains whatever is stored in it. Before another bank can be used, the operating system, driver, or program must explicitly issue a command to the hardware to make the switch. Because switching between banks takes time, memory-intensive operations take longer with bank-switched memory than with main memory. Bank-switched memory typically takes the form of an expansion card that plugs into a slot on the motherboard.

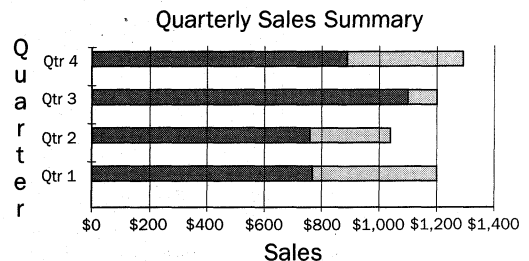
banner *n.* A section of a Web page containing an advertisement that is usually an inch or less tall and spans the width of the Web page. The banner contains a link to the advertiser's Web site. *See also* Web page, Web site.

banner page *n.* **1.** The title page that may be added to printouts by most print spoolers. Such a page typically incorporates account ID information, job length, and print spooler information, and is used primarily to separate one print job from another. *See also* print spooler. **2.** In software, an initial screen used to identify a product and credit its producers.

bar chart *n.* A type of graphic in which data items are shown as rectangular bars. The bars may be displayed either vertically or horizontally and may be distinguished from one another by color or by some type of shading or pattern. Positive and negative values may be shown in relation to a zero baseline. Two types of bar charts are common: a standard bar chart, in which each value is represented by a separate bar, and a stacked bar chart, in which several data points are "stacked" to produce a single bar. *See the illustration. Also called* bar graph.



Vertical bar chart



Stacked bar chart

Bar chart. Two common types of bar chart.

bar code *n.* The special identification code printed as a set of vertical bars of differing widths on books, grocery products, and other merchandise. Used for rapid, error-free input in such facilities as libraries, hospitals, and grocery stores, bar codes represent binary information that can be read by an optical scanner. The coding can include numbers, letters, or

a combination of the two; some codes include built-in error checking and can be read in either direction.

bar code reader *n.* See bar code scanner.

bar code scanner *n.* An optical device that uses a laser beam to read and interpret bar codes, such as the Universal Product Codes found on grocery products and other retail items. See also bar code, Universal Product Code.

bare board *n.* A circuit board with no chips on it; most commonly, a memory board not populated with memory chips.

bare bones¹ *adj.* Purely functional; stripped or otherwise clean of features. Bare bones applications provide only the most basic functions necessary to perform a given task. By the same token, a bare bones computer provides a minimal amount of hardware or is sold at retail with no peripherals and just the operating system (and no other software).

bare bones² *n.* 1. An application that provides only the most basic functions necessary to perform a given task. 2. A computer consisting only of motherboard (equipped with CPU and RAM), cabinet, power supply, floppy disk drive, and keyboard, to which the user must add hard disk, video adapter, monitor, and any other peripherals. See also motherboard, peripheral.

bar graph *n.* See bar chart.

base *n.* 1. In mathematics, a number that is raised to the power specified by an exponent. For example, in $2^3 = 2 \times 2 \times 2 = 8$, the base is 2. 2. In mathematics, the number of digits in a particular numbering system. With microcomputers, four numbering systems are commonly used or referred to—binary, octal, decimal, and hexadecimal—and each is based on a different number of digits. The binary, or base-2, numbering system, which is used to discuss the states of a computer's logic, has two digits, 0 and 1. Octal, or base-8, has eight digits, 0 through 7. The familiar decimal, or base-10, numbering system has ten digits, 0 through 9. Hexadecimal, or base-16, has sixteen digits, 0 through 9 and A through F. When numbers are written in a particular base, the base is often subscripted and enclosed in parentheses after the number, as in $24AE_{(16)} = 9,390$. Also called radix. See also binary¹, decimal, hexadecimal, octal. 3. One of three terminals (emitter, base, and collector) in a bipolar transistor. The current through the base controls the current between the emitter and the collector. See

also transistor. 4. The insulating foundation of a printed circuit board. See also circuit board.

base 10 *adj.* See decimal.

base 16 *adj.* See hexadecimal.

base 2 *adj.* See binary¹.

base 8 *adj.* See octal.

base address *n.* The part of a two-part memory address that remains constant and provides a reference point from which the location of a byte of data can be calculated. A base address is accompanied by an offset value that is added to the base to determine the exact location (the absolute address) of the information. The concept is similar to a street address system. For example, "2010 Main Street" consists of a base (the 2000 block of Main Street) plus an offset (10 from the beginning of the block). Base addresses are known as segment addresses in IBM PCs and compatibles; data in these computers is identified by its position as a relative offset from the start of the segment. See also absolute address, offset, relative address, segment.

baseband *adj.* Of or relating to communications systems in which the medium of transmission (such as a wire or fiber-optic cable) carries a single message at a time in digital form. Baseband communication is found in local area networks such as Ethernet and Token Ring. See also Ethernet, fiber optics, Token Ring network. Compare broadband.

baseband network *n.* A type of local area network in which messages travel in digital form on a single transmission channel between machines connected by coaxial cable or twisted-pair wiring. Machines on a baseband network transmit only when the channel is not busy, although a technique called *time-division multiplexing* can enable channel sharing. Each message on a baseband network travels as a packet that contains information about the source and destination machines as well as message data. Baseband networks operate over short distances at speeds ranging from about 50 kilobits per second (50 Kbps) to 16 megabits per second (16 Mbps). Receiving, verifying, and converting a message, however, add considerably to the actual time, reducing throughput. The maximum recommended distance for such a network is about 2 miles, or considerably less if the network is heavily used. See also coaxial cable, multiplexing, packet (definition 2), throughput, time-division multiplexing, twisted-pair cable. Compare broadband network.

the original computer, the Briefcase updates all files to the most recent version.

brightness *n.* The perceived quality of radiance or luminosity of a visible object. Brightness is literally in the eye (and mind) of the beholder; a candle in the night appears brighter than the same candle under incandescent lights. Although its subjective value cannot be measured with physical instruments, brightness can be measured as luminance (radiant energy). The brightness component of a color is different from its color (the hue) and from the intensity of its color (the saturation). *See also* color model, HSB.

British Naval Connector *n.* *See* BNC.

broadband *adj.* Of or relating to communications systems in which the medium of transmission (such as a wire or fiber-optic cable) carries multiple messages at a time, each message modulated on its own carrier frequency by means of modems. Broadband communication is found in wide area networks. *Compare* baseband.

broadband ISDN *n.* Next-generation ISDN based on ATM (Asynchronous Transfer Mode) technology. Broadband ISDN divides information into two categories: interactive services, which are controlled by the user, and distributed (or distribution) services that can be broadcast to the user. *Acronym:* BISDN. *See also* ISDN, ATM (definition 1).

broadband modem *n.* A modem for use on a broadband network. Broadband technology allows several networks to coexist on a single cable. Traffic from one network does not interfere with traffic from another, since the conversations happen on different frequencies, rather like the commercial radio system. *See also* broadband network.

broadband network *n.* A local area network on which transmissions travel as radio-frequency signals over separate inbound and outbound channels. Stations on a broadband network are connected by coaxial or fiber-optic cable, which can carry data, voice, and video simultaneously over multiple transmission channels that are distinguished by frequency. A broadband network is capable of high-speed operation (20 megabits or more), but it is more expensive than a baseband network and can be difficult to in-

stall. Such a network is based on the same technology used by cable television (CATV). *Also called* wideband transmission. *Compare* baseband network.

broadcast¹ *adj.* Sent to more than one recipient. In communications and on networks, a broadcast message is one distributed to all stations. *See also* e-mail¹ (definition 1).

broadcast² *n.* As in radio or television, a transmission sent to more than one recipient.

broadcast storm *n.* A network broadcast that causes multiple hosts to respond simultaneously, overloading the network. A broadcast storm may occur when old TCP/IP routers are mixed with routers that support a new protocol. *See also* communications protocol, router, TCP/IP.

broken as designed *adj.* *See* BAD.

Brouter *n.* *See* bridge router.

brownout *n.* A condition in which the electricity level is appreciably reduced for a sustained period of time. In contrast to a blackout, or total loss of power, a brownout continues the flow of electricity to all devices connected to electrical outlets, although at lower levels than the normally supplied levels (120 volts in the United States). A brownout can be extremely damaging to sensitive electronic devices, such as computers, because the reduced and often fluctuating voltage levels can cause components to operate for extended periods of time outside the range they were designed to work in. On a computer, a brownout is characterized by a smaller, dimmer, and somewhat fluctuating display area on the monitor and potentially erratic behavior by the system unit. The only reliable means of preventing damage caused by a brownout condition is to use a battery-backed uninterruptible power supply (UPS). *See also* UPS. *Compare* blackout.

browse *vb.* To scan a database, a list of files, or the Internet, either for a particular item or for anything that seems to be of interest. Generally, browsing implies observing, rather than changing, information. In unauthorized computer hacking, browsing is a (presumably) nondestructive means of finding out about an unknown computer after illegally gaining entry.

browser *n.* *See* Web browser.

C

C *n.* A programming language developed by Dennis Ritchie at Bell Laboratories in 1972. It is so named because its immediate predecessor was the B programming language. Although C is considered by many to be more a machine-independent assembly language than a high-level language, its close association with the UNIX operating system, its enormous popularity, and its standardization by the American National Standards Institute (ANSI) have made it perhaps the closest thing to a standard programming language in the microcomputer/workstation marketplace. C is a compiled language that contains a small set of built-in functions that are machine dependent. The rest of the C functions are machine independent and are contained in libraries that can be accessed from C programs. C programs are composed of one or more functions defined by the programmer; thus C is a structured programming language. *See also* C++, compiled language, library, Objective-C, structured programming.

C++ *n.* An object-oriented version of the C programming language, developed by Bjarne Stroustrup in the early 1980s at Bell Laboratories and adopted by a number of vendors, including Apple Computer and Sun Microsystems, Inc. *See also* C, Objective-C, object-oriented programming.

C2 *n.* The lowest level of security in the U.S. National Computer Security Center's hierarchy of criteria for trusted computer systems, requiring user logon with password and a mechanism for auditing. The C2 level is outlined in the Orange Book. *See also* Orange Book (definition 1).

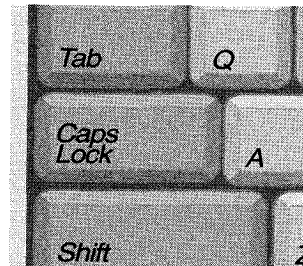
CA *n.* *See* certificate authority.

.cab *n.* File extension for cabinet files, which are multiple files compressed into one and extractable with the extract.exe utility. Such files are frequently found on Microsoft software (for example, Windows 9x) distribution disks.

cabinet *n.* The box in which the main components of a computer (CPU, the hard drive, floppy and CD-ROM drives, and expansion slots for peripheral de-

vices, such as monitors) are located. *See also* CPU, expansion slot.

cable¹ *n.* A collection of wires shielded within a protective tube, used to connect peripheral devices to a computer. A mouse, a keyboard, and a printer might all be connected to a computer with cables. Printer cables typically implement a serial or a parallel path for data to travel along. *See* the illustration.



Cable.

cable² *adj.* Pertaining to the cable television (CATV) distribution system. For example, a cable modem is a modem that sends and receives digital data through a connection to a cable TV system. Because cable TV is a broadband service, it can carry data (such as an Internet connection) at very high speed. *See also* CATV.

cable connector *n.* The connector on either end of a cable. *See also* DB connector, DIN connector, RS-232-C standard, RS-422/423/449.

cable matcher *n.* A device that allows the use of a cable that has slightly different wire connections from those required by the device(s) to which it is attached.

cable modem *n.* A modem that sends and receives data through a coaxial cable television network instead of telephone lines, as with a conventional modem. Cable modems, which have speeds of 500 kilobits per second (Kbps), can generally transmit data faster than current conventional modems. However, cable modems do not operate at the same rate upstream (when sending information) and down-

stream (when receiving information). Upstream rates vary from about 2 Mbps to 10 Mbps, downstream rates from about 10 Mbps to 36 Mbps. *See also* coaxial cable, modem.

cable television *n.* *See* CATV

cabling diagram *n.* A plan that shows the path of cables that attach computer system components or peripherals. Cabling diagrams are particularly important for explaining the connection of disk drives to a disk controller.

cache \kash\ *n.* A special memory subsystem in which frequently used data values are duplicated for quick access. A memory cache stores the contents of frequently accessed RAM locations and the addresses where these data items are stored. When the processor references an address in memory, the cache checks to see whether it holds that address. If it does hold the address, the data is returned to the processor; if it does not, a regular memory access occurs. A cache is useful when RAM accesses are slow compared with the microprocessor speed, because cache memory is always faster than main RAM memory. *See also* disk cache, wait state.

cache card *n.* An expansion card that increases a system's cache memory. *See also* cache, expansion board.

Cache-Coherent Non-Uniform Memory Access *n.* *See* ccNUMA.

cache memory *n.* *See* cache.

cache poisoning *n.* Deliberate corruption of Internet Domain Name System (DNS) information through alteration of data that equates host names with their IP addresses. Misleading information of this type, when cached (saved) by one DNS server and later passed to another, exposes DNS servers to attacks in which data sent from one host to another can be accessed or corrupted. Cache poisoning has been used to redirect network requests from a legitimate server to an alternate Web site. *See also* DNS.

CAD \kad\ *n.* Acronym for computer-aided design. A system of programs and workstations used in designing engineering, architectural, and scientific models ranging from simple tools to buildings, aircraft, integrated circuits, and molecules. Various CAD applications create objects in two or three dimensions, presenting the results as wire-frame "skeletons," as more substantial models with shaded surfaces, or as solid objects. Some programs can also rotate or

resize models, show interior views, generate lists of materials required for construction, and perform other allied functions. CAD programs rely on mathematics, often requiring the computing power of a high-performance workstation. *See also* CAD/CAM, I-CASE.

CAD/CAM \kad'kam\ *n.* Acronym for computer-aided design/computer-aided manufacturing. The use of computers in both the design and manufacture of a product. With CAD/CAM, a product, such as a machine part, is designed with a CAD program and the finished design is translated into a set of instructions that can be transmitted to and used by the machines dedicated to fabrication, assembly, and process control. *See also* CAD, I-CASE.

CADD \kad-D\ A system of hardware and software similar to CAD but with additional features related to engineering conventions, including the ability to display dimension specifications and other notes. *Acronym:* CADD. *See also* CAD.

caddy *n.* A plastic carrier that holds a CD-ROM and is inserted into a CD-ROM drive. Some PCs, especially older models, have CD-ROM drives that require the use of a caddy. Most current CD-ROM drives do not require a caddy.

CAE *n.* Acronym for computer-aided engineering. An application that enables the user to perform engineering tests and analyses on designs created with a computer. In some instances, capabilities such as logic testing that are generally attributed to CAE applications are also part of CAD programs, so the distinction between CAD and CAE is not a hard-and-fast one. *See also* CAD, I-CASE.

CAI *n.* Acronym for computer-aided (or computer-assisted) instruction. An educational program designed to serve as a teaching tool. CAI programs typically use tutorials, drills, and question-and-answer sessions to present a topic and to test the student's comprehension. CAI programs are excellent aids for presenting factual material and for allowing students to pace their learning speed. Subjects and complexity range from beginning arithmetic to advanced mathematics, science, history, computer studies, and specialized topics. *Also called* CAL, CAT, computer-aided learning, computer-assisted learning, computer-aided teaching, computer-assisted learning, computer-assisted teaching, computer-augmented learning. *See also* I-CASE. *Compare* CBT, CMI.

direct digital color proof *n.* A test sheet produced by a lower-cost output device, such as a color laser printer, to serve as an approximation of what the final image will look like when produced on professional-quality printing equipment. A direct digital color proof does not involve color separation, as in traditional proofs. Instead, a direct digital color proof is printed in all colors at one time on a single page, resulting in somewhat lower quality compared with traditional separation methods but having the advantages of increased speed and reduced cost. *Acronym:* DDCP. *Also called* digital proof. *See also* color separation (definition 1).

Direct Graphics Interface Specification *n.* *See* DGIS.

DirectInput *n.* An API (application programming interface) developed by Microsoft for joysticks and similar pointing devices in Windows 9x.

direction key *n.* *See* arrow key.

direct memory access *n.* Memory access that does not involve the microprocessor and is frequently used for data transfer directly between memory and an "intelligent" peripheral device, such as a disk drive. *Acronym:* DMA.

directory *n.* **1.** A catalog for filenames and other directories stored on a disk. A directory is a way of organizing and grouping the files so that the user is not overwhelmed by a long list of them. The topmost directory is called the *root directory*; the directories within a directory are called *subdirectories*. Depending on how an operating system supports directories, filenames in a directory can be viewed and ordered in various ways—for example, alphabetically, by date, by size, or as icons in a graphical user interface. What the user views as a directory is supported in the operating system by tables of data, stored on the disk, that indicate characteristics and the location of each file. In the Macintosh and Windows 9x operating systems, directories are called *folders*. **2.** On a network, an index of names and pertinent information related to authorized users and network resources.

Directory Access Protocol *n.* The protocol that governs communications between X.500 clients and servers. *See also* CCITT X series.

Directory Client Agent *n.* *See* DUA.

Directory Information Base *n.* *See* DIB (definition 2).

directory path *n.* *See* pathname.

directory replication *n.* The copying of a master set of directories from a server (called an *export server*) to specified servers or workstations (called *import computers*) in the same or other domains. Replication simplifies the task of maintaining identical sets of directories and files on multiple computers because only a single master copy of the data must be maintained. *See also* directory, server.

Directory Server Agent *n.* *See* DSA.

directory service *n.* A service on a network that returns mail addresses of other users or enables a user to locate hosts and services.

Directory System Agent *n.* *See* DSA.

directory tree *n.* A graphic display listing the directories and subdirectories on a hard disk in tree form, with subdirectories shown as branches of the main directory. *See also* branch (definition 1), directory, tree structure.

Directory User Agent *n.* *See* DUA.

direct processing *n.* Processing of data as it is received by the system, as opposed to deferred processing, in which data is stored in blocks before processing. *Compare* deferred processing.

direct read after write *n.* *See* DRAW.

direct read during write *n.* *See* DRDW.

direct sequence *n.* In spread spectrum communication, a form of modulation in which a carrier is modulated by a series of binary pulses. *See also* modulation (definition 1), spread spectrum.

direct view storage tube *n.* A type of cathode-ray tube (CRT) in which the screen can retain images for a long time and in which a beam of electrons from an electron gun can be moved arbitrarily across the screen surface (as opposed to a standard cathode-ray tube, in which the electron beam is moved in a specific pattern). This type of CRT is capable of displaying a precise, detailed image without requiring any screen refresh. However, once the image is drawn, it cannot be changed without a complete erasing of the screen. *Acronym:* DVST. *Also called* storage tube. *Compare* CRT.

DirectX *n.* A Windows application programming interface (API) that gives applications direct access to a computer's sound and graphics hardware. DirectX includes a number of components, including DirectDraw for graphics, DirectSound for audio, and Direct3D for three-dimensional graphics.

D

division by zero *n.* An error condition caused by an attempt to divide a number by zero, which is mathematically undefined, or by a number that is sufficiently near to zero that the result is too large to be expressed by the machine. Computers do not allow division by zero, and software must provide some means of protecting the user from program failure on such attempts.

DIX *n.* Acronym for **D**igital **I**ntel **X**erox, the companies that developed the AUI connector for thicknet Ethernet cable. *See also* AUI.

DLC *n.* Acronym for **D**ata **L**ink **C**ontrol. An error-correction protocol in the Systems Network Architecture (SNA) responsible for transmission of data between two nodes over a physical link. Supported by Microsoft Windows NT and Windows 2000, DLC is designed to provide access to IBM mainframe computers and to Hewlett-Packard printers connected to the network. *See also* HDLC, SNA.

DLCI *n.* *See* Data Link Connection Identifier.

.dll *n.* A file extension for a dynamic-link library. *See also* dynamic-link library.

DLL *n.* *See* dynamic-link library.

DLP *n.* Short for **D**igital **L**ight **P**rocessing, a digital projection technology developed by Texas Instruments in which a signal sent from a computer to a DLP projector is projected onto a screen by means of light reflected from a Digital Micromirror Device, or DMD, that consists of thousands of tiny hinged mirrors, each representing one pixel, attached to a chip. The chip acts as a bank of switches, one switch per mirror. These switches, in turn, rotate the mirrors in response to the digital signal to reflect light through a projection lens to create the image. DLP projectors represent a newer technology than the LCD projectors also used to display images on screen. *See also* Digital Micromirror Device.

DLT *n.* *See* digital linear tape.

DMA *n.* *See* direct memory access, document management system.

DMD *n.* *See* Digital Micromirror Device.

DMI *n.* Acronym for **D**esktop **M**anagement **I**nterface. A system for managing the configurations and status of PCs on a network from a central computer. In DMI an agent program runs in the background on each machine and returns information or performs

some action (as specified by a file on that machine) in response to a query received from the central computer. The actions to be performed by the agent may include watching for errors and reporting them to the central computer as they occur; for example, a printer may be set up to report to the central computer when paper runs out or jams. DMI was developed by the DMTF (Desktop Management Task Force), a consortium of computer equipment manufacturers, and competes with SNMP (although the two can coexist on the same system). *See also* agent (definition 1), DMTF. *Compare* SNMP.

DML *n.* *See* data manipulation language.

DMT *n.* *See* discrete multitone.

DMTF *n.* Acronym for **D**esktop **M**anagement **T**ask **F**orce. A consortium formed in 1992 to develop standards for PC-based stand-alone and networked systems based on user and industry needs.

DNA *n.* *See* Digital Network Architecture, digital DNA, distributed network, Windows DNA.

DNS *n.* **1.** Acronym for **D**omain **N**ame **S**ystem. The hierarchical system by which hosts on the Internet have both domain name addresses (such as bluestem.prairienet.org) and IP addresses (such as 192.17.3.4). The domain name address is used by human users and is automatically translated into the numerical IP address, which is used by the packet-routing software. DNS names consist of a top-level domain (such as .com, .org, and .net), a second-level domain (the site name of a business, organization, or individual), and possibly one or more subdomains (servers within a second-level domain). *See also* domain name address, IP address. **2.** Acronym for **D**omain **N**ame **S**ervice. The Internet utility that implements the Domain Name System. DNS servers, also called *name servers*, maintain databases containing the addresses and are accessed transparently to the user. *See also* Domain Name System (definition 1), DNS server.

DNS name server *n.* *See* DNS server.

DNS server *n.* Short for **D**omain **N**ame **S**ystem **s**erver, a computer that can answer Domain Name System (DNS) queries. The DNS server keeps a database of host computers and their corresponding IP addresses. Presented with the name apex.com, for example, the DNS server would return the IP address

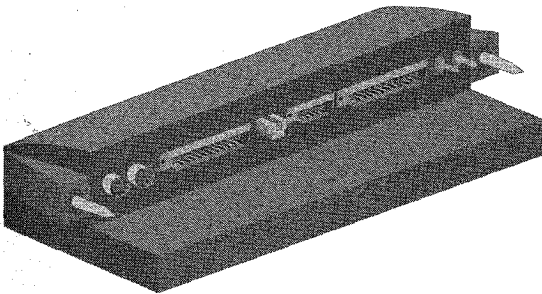
of the hypothetical company Apex. *Also called* name server. *See also* DNS (definition 2), IP address.

.doc *n.* A file extension that identifies document files formatted for a word processor. This is the default file extension for Microsoft Word document files.

dock *vb.* **1.** To connect a laptop or notebook computer to a docking station. *See also* docking station, laptop, portable computer. **2.** To move a toolbar to the edge of an application window so that it attaches to and becomes a feature of the application window.

docking mechanism *n.* The portion of a docking station that physically connects the portable computer with the station. *See also* docking station.

docking station *n.* A unit for housing a laptop or notebook computer that contains a power connection, expansion slots, and connections to peripherals, such as a monitor, printer, full-sized keyboard, and mouse. The purpose of a docking station is to turn the laptop or notebook computer into a desktop machine and allow users the convenience of using such peripherals as a monitor and a full-sized keyboard. *See the illustration. See also* expansion slot, laptop, peripheral, portable computer.



Docking station.

DOCSIS \dok'sis\ *n.* Acronym for Data Over Cable Service Interface Specification. The International Telecommunications Union standard (ITU Recommendation J.112) that specifies functions and internal and external interfaces for high-speed, bidirectional transfer of digital data between cable television networks and subscribers. DOCSIS-compliant equipment ensures interoperability between cable modems and the cable television infrastructure, regardless of manufacturer or provider. Initially developed by a group of cable television providers, including Time Warner and TCI, DOCSIS was designed to support data, video, and rapid Internet access. Data rates are 27 Mbps or 36 Mbps downstream (from the cable

network) and 320 Kbps to 10 Mbps upstream (to the cable network). *See also* cable modem. *Compare* IEEE 802.14.

doctype \dok'tip\ *n.* A declaration at the beginning of an SGML document that gives a public or system identifier for the document type definition (DTD) of the document. *See also* SGML.

document¹ *n.* Any self-contained piece of work created with an application program and, if saved on disk, given a unique filename by which it can be retrieved. Documents are generally thought of as word-processed materials only. To a computer, however, data is nothing more than a collection of characters, so a spreadsheet or a graphic is as much a document as is a letter or report. In the Macintosh environment in particular, a document is any user-created work named and saved as a separate file.

document² *vb.* To explain or annotate something, such as a program or a procedure.

documentation *n.* The set of instructions shipped with a program or a piece of hardware. Documentation usually includes necessary information about the type of computer system required, setup instructions, and instructions on the use and maintenance of the product.

document-centric *adj.* Of, pertaining to, or characteristic of an operating system in which the user opens document files and thus automatically invokes the applications (such as word processors or spreadsheet programs) that process them. Many graphical user interfaces, such as the Macintosh Finder, as well as the World Wide Web, are document-centric. *Compare* application-centric.

Document Content Architecture *n.* *See* DCA (definition 1).

Document Content Description *n.* *See* DCD (definition 2).

document file *n.* A user-created file that represents the output of a program. *Also called* data file. *Compare* program file.

document image processing *n.* A system for storing and retrieving information for an enterprise in the form of bitmapped images of paper documents input with a scanner rather than in the form of text and numeric files. Document image processing takes more memory than purely electronic data processing, but it more readily incorporates signatures, drawings, and photographs and can be more familiar to users without computer training. *See also* paperless office.

e-text \E'tekst\ *n.* Short for **electronic text**. A book or other text-based work that is available on line in an electronic media format. An e-text can be read on line or downloaded to a user's computer for offline reading. *See also* ezine.

Ethernet \ē'thər-net\ *n.* **1.** The IEEE 802.3 standard for contention networks. Ethernet uses a bus or star topology and relies on the form of access known as Carrier Sense Multiple Access with Collision Detection (CSMA/CD) to regulate communication line traffic. Network nodes are linked by coaxial cable, by fiber-optic cable, or by twisted-pair wiring. Data is transmitted in variable-length frames containing delivery and control information and up to 1,500 bytes of data. The Ethernet standard provides for baseband transmission at 10 megabits (10 million bits) per second and is available in various forms, including those known as Thin Ethernet, Thick Ethernet, 10Base2, 10Base5, 10Base-F, and 10Base-T. The IEEE standard dubbed 802.3z, or Gigabit Ethernet, operates at 10 times 100 Mbps speed. *See also* baseband, bus network, coaxial cable, contention, CSMA/CD, Gigabit Ethernet, IEEE 802 standards, twisted-pair cable. **2.** A widely used local area network system developed by Xerox in 1976, from which the IEEE 802.3 standard was developed.

Ethernet/802.3 *n.* The IEEE standard for 10- or 100-Mbps transmissions over an Ethernet network. Ethernet/802.3 defines both hardware and data packet construction specifications. *See also* Ethernet.

E-time \ē'tīm\ *n.* *See* execution time.

etiquette *n.* *See* netiquette.

ETX *n.* *See* end-of-text.

Eudora \yoo'dōr'ə\ *n.* An e-mail client program originally developed as freeware for Macintosh computers by Steve Dörner at the University of Illinois, now maintained in both freeware and commercial versions for both Macintosh and Windows by Qualcomm, Inc.

EULA \yoo'lə\ *n.* *See* End-User License Agreement.

European Computer Manufacturers Association *n.* *See* ECMA.

European Laboratory for Particle Physics *n.* *See* CERN.

evaluation *n.* The determination, by a program, of the value of an expression or the action that a program statement specifies. Evaluation can take place at compile time or at run time.

even parity *n.* *See* parity.

event *n.* An action or occurrence, often generated by the user, to which a program might respond—for example, key presses, button clicks, or mouse movements. *See also* event-driven programming.

event-driven *adj.* Of, pertaining to, or being software that accomplishes its purpose by responding to externally caused events, such as the user pressing a key or clicking a button on a mouse. For example, an event-driven data entry form will allow the user to click on and edit any field at any time rather than forcing the user to step through a fixed sequence of prompts.

event-driven processing *n.* A program feature belonging to more advanced operating-system architectures such as the Apple Macintosh operating system, Windows, and UNIX. In times past, programs were required to interrogate, and effectively anticipate, every device that was expected to interact with the program, such as the keyboard, mouse, printer, disk drive, and serial port. Often, unless sophisticated programming techniques were used, one of two events happening at the same instant would be lost. Event processing solves this problem through the creation and maintenance of an event queue. Most common events that occur are appended to the event queue for the program to process in turn; however, certain types of events can preempt others if they have a higher priority. An event can be of several types, depending on the specific operating system considered: pressing a mouse button or keyboard key, inserting a disk, clicking on a window, or receiving information from a device driver (as for managing the transfer of data from the serial port or from a network connection). *See also* autpolling, event, interrupt.

event-driven programming *n.* A type of programming in which the program constantly evaluates and responds to sets of events, such as key presses or mouse movements. Event-driven programs are typical of Apple Macintosh computers, although most graphical interfaces, such as Windows or the X Window System, also use such an approach. *See also* event.

exa- *prefix* A prefix meaning one quintillion (10^{18}). In computing, which is based on the binary (base-2) numbering system, exa- has a literal value of 1,152,921,504,606,846,976, which is the power of 2 (2^{60}) closest to one quintillion. *Abbreviation:* E.

scanned in. Fax modems may be internal or external and may combine fax and conventional modem capabilities. *See also* fax, modem.

fax on demand *n.* An automated system that makes information available for request by telephone. When a request is made, the system faxes the information to the telephone number given in the request. *Acronym:* FOD.

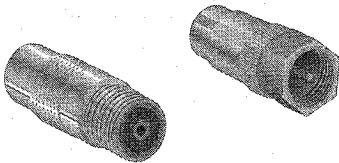
fax program *n.* A computer application that allows the user to send, receive, and print fax transmissions. *See also* fax.

fax server *n.* A computer on a network capable of sending and receiving fax transmissions to and from other computers on the network. *See also* fax, server (definition 1).

FCB *n.* *See* file control block.

FCC *n.* Acronym for **Federal Communications Commission**. The U.S. agency created by the Communications Act of 1934, which regulates interstate and international wire, radio, and other broadcast transmissions, including telephone, telegraph, and telecommunications.

F connector *n.* A coaxial connector, used primarily in video applications, that requires a screw-on attachment. *See* the illustration.



F Connector.

FDDI *n.* Acronym for **Fiber Distributed Data Interface**. A standard developed by the American National Standards Institute (ANSI) for high-speed fiber-optic LANs (local area networks). FDDI provides specifications for transmission rates of 100 megabits (100 million bits) per second on networks based on the token ring standard. *See also* token ring network.

FDDI II *n.* Acronym for **Fiber Distributed Data Interface II**. An extension of the FDDI standard, FDDI contains additional specifications for the real-time transmission of analog data in digitized form for high-speed fiber-optic LANs (local area networks). *See also* FDDI.

FDHP *n.* Acronym for **Full Duplex Handshaking Protocol**. A protocol used by duplex modems to determine the source type of the transmission and match it. *See also* duplex¹, handshake.

FDM *n.* Acronym for **frequency-division multiplexing**. A means of loading multiple transmission signals onto separate bands of a single communications channel so that all signals can be carried simultaneously. FDM is used in analog transmissions, as on a baseband network or in communications over a telephone line. In FDM the frequency range of the channel is divided into narrower bands, each of which can carry a different transmission signal. For example, FDM might divide a voice channel with a frequency range of 1,400 hertz (Hz) into four subchannels—820–990 Hz, 1,230–1,400 Hz, 1,640–1,810 Hz, and 2,050–2,220 Hz—with adjacent subchannels separated by a 240-Hz guard band to minimize interference.

FDMA *n.* Acronym for **Frequency Division Multiple Access**. A method of multiplexing in which the set of frequencies assigned to cellular phone service is divided into 30 separate channels, each of which can be used by a different caller. FDMA is the technology used in the AMPS phone service, which is widespread in North America and in other countries around the world. *See also* AMPS. *Compare* TDMA.

fear, uncertainty, and doubt *n.* *See* FUD.

feasibility study *n.* An evaluation of a prospective project for the purpose of determining whether or not the project should be undertaken. Feasibility studies normally consider the time, budget, and technology required for completion and are generally used in computing departments in large organizations.

feature *n.* A unique, attractive, or desirable property of a program or of a computer or other hardware.

feature extraction *n.* The selection of significant aspects of a computer image for use as guidelines in computerized pattern matching and image recognition. *See also* image processing.

featuritis /fē'chur-ī-tus/ *n.* Jargon for a tendency to add new features to a program at the expense of its original compact size or elegance. Creeping featuritis describes the accretion of feature upon feature over time, eventually resulting in a large, unwieldy, generally inelegant program that is, or appears to be, a collection of ad-hoc additions. The result of featuritis

gram for different countries or languages because the correct order of characters in one language might be incorrect in another.

local loop *n.* The (end) portion of a telephone connection that runs from the subscriber to the local telephone exchange. *See also* last mile.

local memory *n.* In multiprocessor systems, the memory on the same card or high-speed bus as a particular processor. Typically, memory that is local to one processor cannot be accessed by another without some form of permission.

local newsgroups *n.* Newsgroups that are targeted toward a geographically limited area such as a city or educational institution. Posts to these newsgroups contain information that is specific to the area, concerning such topics as events, meetings, and sales. *See also* newsgroup.

local reboot *n.* A reboot of the machine that one is directly working on, rather than a remote host. *See also* reboot.

LocalTalk *n.* An inexpensive cabling scheme used by AppleTalk networks to connect Apple Macintosh computers, printers, and other peripheral devices. *See also* AppleTalk.

local variable *n.* A program variable whose scope is limited to a given block of code, usually a subroutine. *See also* scope (definition 1). *Compare* global variable.

location *n.* *See* address¹ (definition 1).

lock *n.* **1.** A software security feature that requires a key or dongle in order for the application to run correctly. *See also* dongle. **2.** A mechanical device on some removable storage media (for example, the write-protect notch on a floppy disk) that prevents the contents from being overwritten. *See also* write-protect notch.

locked file *n.* **1.** A file on which one or more of the usual types of manipulative operation cannot be performed—typically, one that cannot be altered by additions or deletions. **2.** A file that cannot be deleted or moved or whose name cannot be changed.

locked volume *n.* On the Apple Macintosh, a volume (storage device, such as a disk) that cannot be written to. The volume can be locked either physically or through software.

lockout *n.* The act of denying access to a given resource (file, memory location, I/O port), usually

to ensure that only one program at a time uses that resource.

lock up *n.* A condition in which processing appears to be completely suspended and in which the program in control of the system will accept no input. *See also* crash¹.

log *n.* A record of transactions or activities that take place on a computer system. *See* logarithm.

logarithm *n.* Abbreviated log. In mathematics, the power to which a base must be raised to equal a given number. For example, for the base 10, the logarithm of 16 is (approximately) 1.2041 because $10^{1.2041}$ equals (approximately) 16. Both natural logarithms (to the base *e*, which is approximately 2.71828) and common logarithms (to the base 10) are used in programming. Languages such as C and Basic include functions for calculating natural logarithms.

logic *n.* In programming, the assertions, assumptions, and operations that define what a given program does. Defining the logic of a program is often the first step in developing the program's source code. *See also* formal logic.

logical *adj.* **1.** Based on true and false alternatives as opposed to arithmetic calculation of numeric values. For example, a logical expression is one that, when evaluated, has a single outcome, either true or false. *See also* Boolean algebra. *Compare* fuzzy logic. **2.** Conceptually true to a particular design or idea—for example, network transmissions travel in a circle around a logical ring, even though the ring shape itself is not physically apparent. *Compare* physical.

logical decision *n.* Any decision that can have one of two outcomes (true/false, yes/no, and so on). *Compare* fuzzy logic.

logical device *n.* A device named by the logic of a software system, regardless of its physical relationship to the system. For example, a single floppy disk drive can simultaneously be, to the MS-DOS operating system, both logical drive A and drive B.

logical drive *n.* *See* logical device.

logical error *n.* *See* logic error.

logical expression *n.* *See* Boolean expression.

logical file *n.* A file as seen from a conceptual standpoint, without reference to and as distinct from its physical realization in memory or storage. For example, a logical file might consist of a contiguous series of records, whereas the file might be physically

protocol used for modem connections over analog cellular telephone connections. The most recent version of MNP10 is MNP 10EC (EC stands for Enhanced Cellular). *See also* communications protocol.

mobile computing *n.* The process of using a computer while traveling. Mobile computing usually requires a portable computer that is battery powered, rather than a desktop system.

mode *n.* The operational state of a computer or a program. For example, edit mode is the state in which a program accepts changes to a file. *See also* address mode, compatibility mode, safe mode, video mode, virtual real mode.

modem \mōˈdek\ *n.* In telecommunications, a device that generates analog modem signals digitally. The term *modem* is a combination of the terms *modem* and *codec*. *See also* codec (definition 1), modem.

model *n.* A mathematical or graphical representation of a real-world situation or object—for example, a mathematical model of the distribution of matter in the universe, a spreadsheet (numeric) model of business operations, or a graphical model of a molecule. Models can generally be changed or manipulated so that their creators can see how the real version might be affected by modifications or varying conditions. *See also* modeling, simulation.

modeling *n.* **1.** The use of computers to describe the behavior of a system. Spreadsheet programs, for example, can be used to manipulate financial data, representing the health and activity of a company; to develop business plans and projections; or to evaluate the impact of proposed changes on the company's operations and financial status. *See also* simulation, spreadsheet program. **2.** The use of computers to describe physical objects and the spatial relationships among them mathematically. CAD programs, for example, are used to create on-screen representations of such physical objects as tools, office buildings, complex molecules, and automobiles. These models use equations to create lines, curves, and other shapes and to place those shapes accurately in relation to each other and to the two-dimensional or three-dimensional space in which they are drawn. *See also* CAD, rendering, solid model, surface modeling, three-dimensional model, two-dimensional model, wire-frame model.

modem *n.* Short for **modulator/demodulator**. A communications device that enables a computer to trans-

mit information over a standard telephone line. Because a computer is digital (works with discrete electrical signals representing binary 1 and binary 0) and a telephone line is analog (carries a signal that can have any of a large number of variations), modems are needed to convert digital to analog and vice versa. When transmitting, modems impose (modulate) a computer's digital signals onto a continuous carrier frequency on the telephone line. When receiving, modems sift out (demodulate) the information from the carrier and transfer it in digital form to the computer. Sophisticated modems are also capable of such functions as automatic dialing, answering, and redialing in addition to transmitting and receiving. Without appropriate communications software, however, modems cannot perform any useful work. *See also* baud rate.

modem bank *n.* A collection of modems connected to a server maintained by an ISP or the operator of a BBS or remote-access LAN. Most modem banks are configured to allow a remote user to dial a single phone number that routes calls to an available phone number on the bank. *See also* BBS (definition 1), ISP, LAN.

modem eliminator *n.* A device that enables two computers to communicate without modems. *See also* null modem.

modem port *n.* A serial port used for connecting an external modem to a personal computer. *See also* modem, serial port.

modem ready *n.* *See* MR.

moderated *adj.* Subjected to review by a moderator, who may remove irrelevant or inflammatory articles or messages before redistributing them through a newsgroup, mailing list, or other messaging system.

moderated discussion *n.* Communication taking place on a mailing list, newsgroup, or other online forum that is edited by a moderator. When one submits a message to a moderated discussion, the moderator decides if the message is relevant to the discussion topic. If so, it is forwarded to the discussion group. The content of a moderated discussion is often perceived as more valuable than that of an unmoderated one because the information has been read and approved by a "gatekeeper," who has (presumably) filtered out irrelevant submissions. Some moderators also filter submissions for obscene or pornographic material or material that is potentially offensive. *See also* mailing list, moderator, newsgroup.

16-bit application to load and call a 32-bit DLL; and a universal thunk allows 32-bit code to load and call a 16-bit DLL. All thunks are Windows-based, but the type of thunk used depends on the Windows version.

thunk² *vb.* To call 32-bit code from 16-bit code, or vice versa. Thunking involves, in large part, the translation to and from 16-bit segment:offset memory addressing and 32-bit flat, or linear, memory addressing. *See also* address space, flat address space, segmented address space.

TIA *n.* Acronym for thanks in advance. On the Internet, a popular sign-off to a request of some sort. *Also called* aTdHvAaNnKcSe.

tick *n.* **1.** A regular, rapidly recurring signal emitted by a clocking circuit; also, the interrupt generated by this signal. **2.** In some microcomputer systems, notably Macintosh, one sixtieth of a second, the basic time unit used by the internal clock that is accessible by programs.

tiebreaker *n.* A circuit that arbitrates competing circuits and resolves bottlenecks by giving priority to one circuit at a time.

tie line *n.* A private line leased from a communications carrier and often used to link two or more points in an organization.

Tier 1 *n.* An Internet Network Access Point that provides access to and interconnection among major national and international network backbone providers, such as MCI WorldCom, Sprint, BBN, and IBM. *See also* Network Access Point. *Compare* Tier 2.

Tier 2 *n.* A regional Internet Network interchange location where local ISPs exchange data. By using a Tier 2 exchange point, ISPs in the same area can move data between their users without the need to transport that data over long distances. For example, if a user in Singapore connects to a Web site in the same city through a local Tier 2 exchange point, it is not necessary to move the data through a major Network Access Point, or NAP, in Japan or North America. Tier 2 locations generally have much smaller capacities than the national and international Tier 1 NAPs. *See also* Network Access Point. *Compare* Tier 1.

.tif or **.tiff** *n.* The file extension that identifies bitmap images in Tagged Image File Format (TIFF). *See also* TIFF.

TIFF or **TIF** \tif\ *n.* Acronym for Tagged Image File Format or Tag Image File Format. A standard file format commonly used for scanning, storage, and

interchange of gray-scale graphic images. TIFF may be the only format available for older programs (such as older versions of MacPaint), but most modern programs are able to save images in a variety of other formats, such as GIF or JPEG. *See also* gray scale. *Compare* GIF, JPEG.

TIFF JPEG \tif' J'pæg\ *n.* Acronym for Tagged Image File Format **JPEG**. A means of saving photographic images compressed according to the JPEG (Joint Photographic Experts Group) standard. TIFF JPEG saves more information about an image than does the lower-end JFIF (JPEG File Interchange Format), but TIFF JPEG files are limited in portability because of differences in implementation among applications. *See also* JPEG, JFIF.

TIGA \ti'gə\ *n.* Acronym for Texas Instruments Graphics Architecture. A video adapter architecture based on the Texas Instruments 340x0 graphics processor.

tightly coupled *adj.* **1.** Refers to two computing processes whose successful completion and individual performance rates are highly interdependent. **2.** Of, pertaining to, or characteristic of a relationship of interdependency between computers, as in multiprocessing.

tile *vb.* **1.** In computer-graphics programming, to fill adjacent blocks of pixels on the screen with a design or pattern without allowing any blocks to overlap. **2.** To fill the space on a monitor or within a smaller area with multiple copies of the same graphic image. **3.** In an environment with multiple windows, to rearrange and resize all open windows so that they appear fully on the screen without any overlap.

time and date *n.* In computing, the timekeeping and datekeeping functions maintained by the computer's operating system, used most visibly as a means of "stamping" files with the date and time of creation or last revision.

Time Division Multiple Access *n.* *See* TDMA.

time-division multiplexing *n.* A form of multiplexing in which transmission time is broken into segments, each of which carries one element of one signal. *See also* statistical multiplexer. *Compare* FDM.

time out or **timeout** or **time-out** *n.* An event that indicates that a predetermined amount of time has elapsed without some other expected event taking place. The time-out event is used to interrupt the process that had been waiting for the other expected event. For example, a dial-up remote system might

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