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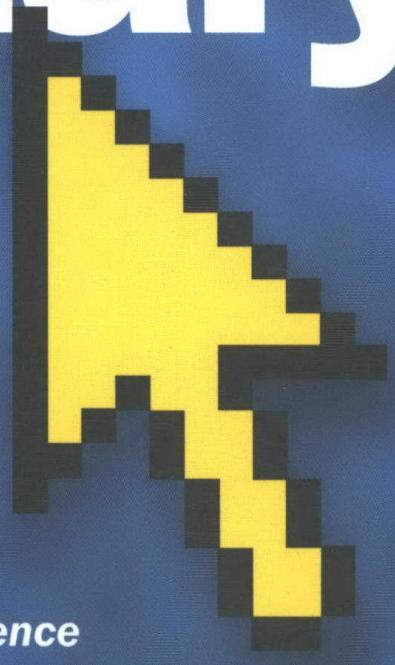
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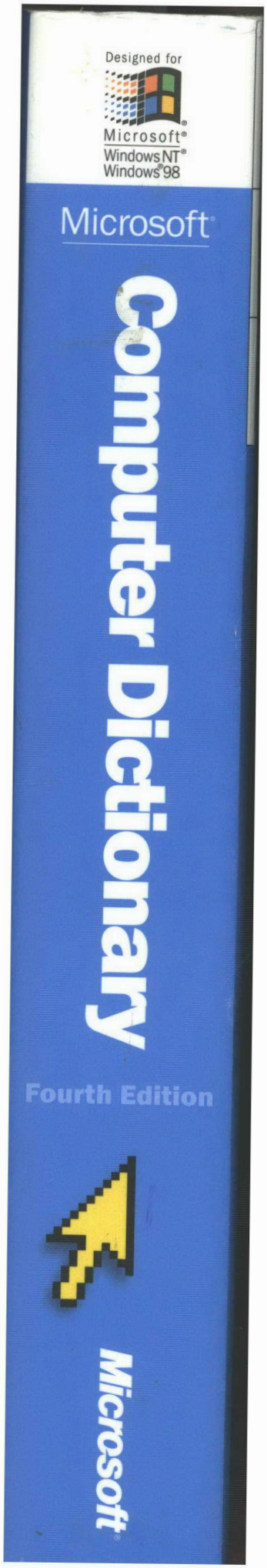
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IBM's Exhibit 1028
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Project Editor: Kim Fryer

AC adapter *n.* An external power supply that converts from a 110 VAC or 220 VAC domestic electric supply ("house current" or "main power") to low-voltage DC, which is required to operate solid-state electronic equipment (such as a laptop computer) that does not include an internal power supply.

Accelerated Graphics Port *n. See* AGP.

accelerator *n.* **1.** In applications, a key or key combination used to perform a defined function. *Also called* shortcut key. **2.** In hardware, a device that speeds or enhances the operation of one or more subsystems, leading to improved program performance. *See also* accelerator card, Windows-based accelerator.

accelerator board *n. See* accelerator card.

accelerator card *n.* A printed circuit board that replaces or augments the computer's main microprocessor, resulting in faster performance. *Also called* accelerator board. *See also* expansion board, graphics accelerator.

acceptable use policy *n.* A statement issued by an ISP (Internet service provider) or an online information service that indicates what activities users may or may not engage in while logged into the service. For example, some providers prohibit users from engaging in commercial activity on the network. *Acronym:* AUP. *See also* ISP, online information service.

acceptance test *n.* A formal evaluation of a hardware product performed by the customer, usually at the factory, to verify that the product is performing according to specifications.

access[1] *n.* **1.** The act of reading data from or writing data to memory. **2.** Connection to the Internet or other network or system.

access[2] *vb.* To gain entry to memory in order to read or write data.

access arm *n.* A mechanical arm that moves the read/write head(s) over the surface of a disk in a disk drive. See the illustration. *Also called* head arm.

ACCESS.bus *n.* A bidirectional bus for connecting peripherals to a PC. The ACCESS.bus can connect up to 125 low-speed peripherals, such as printers, modems, mice, and keyboards, to the system through a single, general-purpose port. Peripherals that support the ACCESS.bus provide a connector or port connection that is similar to a phone-jack connector and are daisy-chained together. However, the PC communicates directly with each peripheral and vice versa. Connecting an ACCESS.bus device (for example, a printer) to a system results in the system automatically identifying and configuring it for optimum performance. Peripherals can be connected while the computer is running *(hot plugging)* and are automatically assigned a unique address (auto-addressing). Developed from the architecture designed jointly by Philips and Digital Equipment Corporation, the ACCESS.bus specification is controlled by the ACCESS.bus Industry Group and competes with Intel's USB. *See also* bidirectional, bus, daisy chain[1], hot plugging, input/output port, peripheral. *Compare* USB.

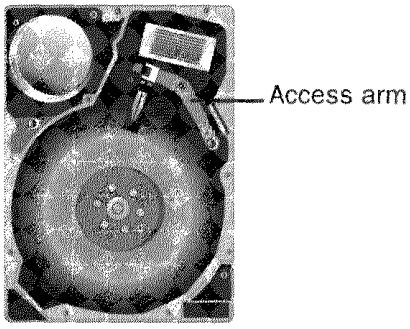
access code *n. See* password.

access control *n.* The mechanisms for limiting access to certain items of information or to certain controls based on users' identities and their membership in various predefined groups. Access control is typically used by system administrators for controlling user access to network resources, such as servers, directories, and files. *See also* access privileges, system administrator.

access control list *n.* A list associated with a file that contains information about which users or groups have permission to access or modify the file. *Acronym:* ACL.

accessibility *n.* A quality of software, hardware, or a complete computer system that makes it usable by people with one or more physical disabilities, such as restricted mobility, blindness, or deafness.

access mechanism *n.* **1.** The disk drive components that move the read/write head(s) to the proper track of a magnetic disk or optical disc. *See also* disk controller. **2.** A circuit that allows one part of a computer system to send signals to another part. **3.** In programming, the means by which an application can read from or write to a resource. *Also called* access method.



Access arm.

Ex. 1028, Page 4

access method *n. See* access mechanism (definition 3).

access number *n.* The telephone number used by a subscriber to gain access to an online service.

accessory *n. See* peripheral.

access path *n. See* search path.

access permission *n. See* permission.

access point *n.* In a wireless LAN (local area network), a transceiver that connects it to a wired network. *See also* wireless LAN.

access privileges *n.* The type of operations permitted a given user for a certain system resource on a network or a file server. A variety of operations, such as the ability to access a server, view the contents of a directory, open or transfer files, and create, modify, or delete files or directories, can be allowed or disallowed by the system administrator. Assigning access privileges to users helps the system administrator to maintain security on the system, as well as the privacy of confidential information, and to allocate system resources, such as disk space. *Also called* access rights. *See also* file protection, file server, permission, system administrator, write access.

access provider *n. See* ISP.

access rights *n. See* access privileges.

access speed *n. See* access time.

access time *n.* **1.** The amount of time it takes for data to be delivered from memory to the processor after the address for the data has been selected. **2.** The time needed for a read/write head in a disk drive to locate a track on a disk. Access time is usually measured in milliseconds and is used as a performance measure for hard disks and CD-ROM drives. *See also* read/write head, seek time, settling time, wait state. *Compare* cycle time.

account *n.* **1.** A record-keeping arrangement used by the vendor of an online service to identify a subscriber and to maintain a record of customer usage for billing purposes. **2.** The record-keeping mechanism used by networks and multiuser operating systems for keeping track of authorized users. Network accounts are created by network administrators and are used both to validate users and to administer policies—for example, permissions—related to each user.

accounting file *n.* A file generated by a printer controller that keeps track of the number of pages printed per job as well as the user that requested the print job.

accounting machine *n.* **1.** One of the earliest applications of automatic data processing, used in business accounting primarily during the 1940s and 1950s. The first accounting machines were nonelectronic and used punched cards and wires arranged in plugboard panels. **2.** A computer in which an accounting software package starts up whenever the machine is turned on, the computer thus becoming a dedicated machine with accounting as its sole function.

account name *n.* The part of an e-mail address that identifies a user, or an account, on an e-mail system. An e-mail address on the Internet typically consist of an account name, followed by the @ (at) symbol, a host name, and a domain name. *See also* account (definition 2), domain name, e-mail address.

account policy *n.* On local area networks and multiuser operating systems, a set of rules governing whether a new user is allowed access to the system and whether an existing user's rights are expanded to include additional system resources. An account policy also generally states the rules with which the user must comply while using the system in order to maintain access privileges.

ACCU *n. See* Association of C and C++ Users.

accumulator *n.* A register used for logic or arithmetic, usually to count items or accumulate a sum. *See also* register.

accuracy *n.* The degree to which the result of a calculation or measurement approximates the true value. *Compare* precision (definition 1).

ACIS *n.* Acronym for **A**ndy, **C**harles, **I**an's **S**ystem. An object-oriented geometric modeling toolkit owned by Spatial Technology. Designed for use as a "geometry engine" within 3-D modeling applications, ACIS provides an open architecture framework for wire-frame, surface, and solid modeling from a common, unified data structure. ACIS is generally considered the de facto standard for solid modeling in the CAM/CAE industries.

ACK \ak\ *n.* Short for **ack**nowledgment. A message sent by the receiving unit to the sending station or computer indicating either that the unit is ready to receive transmission or that a transmission was received without error. *Compare* NAK.

ACL *n. See* access control list.

ACM *n. See* Association for Computing Machinery.

D

DA *n. See* desk accessory.

DAC \dak\ *n. See* digital-to-analog converter.

daemon *n.* A program associated with UNIX systems that performs a housekeeping or maintenance utility function without being called by the user. A daemon sits in the background and is activated only when needed, for example, to correct an error from which another program cannot recover.

daisy chain[1] *n.* A set of devices connected in series. In order to eliminate conflicting requests to use the channel (bus) to which all the devices are connected, each device is given a different priority. SCSI (**S**mall **C**omputer **S**ystem **I**nterface) and the newer USB (**U**niversal **S**erial **B**us) both support daisy chained devices. *See also* SCSI, USB.

daisy chain[2] *vb.* To connect a series of devices, one to another, like daisies in a chain of flowers.

daisy wheel *n.* A print element consisting of a set of formed characters with each character mounted on a separate type bar, all radiating from a center hub. *See also* daisy-wheel printer, thimble, thimble printer.

daisy-wheel printer *n.* A printer that uses a daisy-wheel type element. Daisy-wheel output is crisp and slightly imprinted, with fully formed characters resembling typewriter quality. Daisy-wheel printers were standard for high-quality printing until being superseded by laser printers. *See also* daisy wheel, thimble, thimble printer.

damping *n.* A technique for preventing overshoot (exceeding the desired limit) in the response of a circuit or device.

D-AMPS *n.* Acronym for **D**igital **A**dvanced **M**obile **P**hone Service. The digital form of the analog AMPS cellular phone service. D-AMPS, sometimes spelled DAMPS, differs from AMPS in being digital and in tripling the number of available channels by using time division multiple access (TDMA) to divide each of the 30 AMPS channels into three separate channels. *See also* AMPS, FDMA, TDMA.

DAP \dap\ *n. See* Directory Access Protocol.

dark fiber *n.* Unused capacity in fiber-optic communications.

Darlington circuit *n.* An amplifier circuit made of two transistors, often mounted in the same housing. The collectors of the two transistors are connected, and the emitter of the first is connected to the base of the second. Darlington circuits provide high-gain amplification. *Also called* Darlington pair.

Darlington pair *n. See* Darlington circuit.

DARPA \där´pə\ *n. See* Defense Advanced Research Projects Agency.

DARPANET \där´pə-net`\ *n.* Short for **D**efense **A**dvanced **R**esearch **P**rojects **A**gency **Net**work. *See* ARPANET.

DAS *n. See* dual attachment station.

DASD \daz´dē\ *n.* Acronym for **d**irect **a**ccess **s**torage **d**evice. A data storage device by which information can be accessed directly, instead of by passing sequentially through all storage areas. For example, a disk drive is a DASD, but a tape unit is not, because, with a tape unit, the data is stored as a linear sequence. *See also* direct access. *Compare* sequential access.

.dat *n.* A generic file extension for a data file.

DAT \dat\ *n. See* digital audio tape, dynamic address translation.

data *n.* Plural of the Latin *datum,* meaning an item of information. In practice, *data* is often used for the singular as well as the plural form of the noun. *Compare* information.

data acquisition *n.* The process of obtaining data from another source, usually one outside a specific system.

data aggregate *n.* A collection of data records. It usually includes a description of the placement of the data blocks and their relation to the entire set.

data attribute *n.* Structural information about data that describes its context and meaning.

data bank *n.* Any substantial collection of data.

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information read from disk. A disk cache does not hold entire files, as does a RAM disk (a portion of memory that acts as if it were a disk drive). Instead, a disk cache is used to hold information that either has recently been requested from disk or has previously been written to disk. If the required information remains in a disk cache, access time is considerably faster than if the program must wait for the disk drive mechanism to fetch the information from disk. *See also* cache. *Compare* disk buffer.

disk cartridge *n.* A removable disk enclosed in a protective case. A disk cartridge can be used by certain types of hard disk drives and related devices, such as the external data storage units known as Bernoulli boxes.

disk controller *n.* A special-purpose chip and associated circuitry that directs and controls reading from and writing to a computer's disk drive. A disk controller handles such tasks as positioning the read/write head, mediating between the drive and the microprocessor, and controlling the transfer of information to and from memory. Disk controllers are used with floppy disk drives and hard disks and can either be built into the system or be part of a card that plugs into an expansion slot.

disk copy *n.* The process of duplicating a source disk's data and the data's organizational structure onto a target disk. *See also* backup.

disk crash *n.* The failure of a disk drive. *See also* crash[1].

disk directory *n.* An index of the files on a disk, analogous to a card catalog. A disk directory includes information about the files, such as their names, sizes, dates of creation, and physical locations on the disk. *See also* directory.

disk drive *n.* An electromechanical device that reads from and writes to disks. The main components of a disk drive include a spindle on which the disk is mounted, a drive motor that spins the disk when the drive is in operation, one or more read/write heads, a second motor that positions the read/write head(s) over the disk, and controller circuitry that synchronizes read/write activities and transfers information to and from the computer. Two types of disk drives are in common use: floppy disk drives and hard disk drives. Floppy disk drives are designed to accept removable disks in either 5.25-inch or 3.5-inch format; hard disk drives are faster, high-capacity storage units that are completely enclosed in a protective case.

disk driver *n.* A device driver that is added to a system to support a specific manufacturer's disk device. *See also* device driver.

disk duplexing *n.* *See* disk mirroring.

disk envelope *n.* The paper container that holds a 5.25-inch floppy disk and its attached jacket. The disk envelope protects exposed surfaces of the disk from dust and other foreign material that can scratch and otherwise damage the surface, resulting in the loss of recorded data. *See also* disk jacket.

diskette *n.* *See* floppy disk.

disk interface *n.* **1.** The circuitry that connects a disk drive to a computer system. **2.** A standard for connecting disk drives and computers. The ST506 standard for connecting hard disks to computers is a disk interface standard.

disk jacket *n.* The protective plastic sheath that covers a floppy disk.

diskless workstation *n.* A station on a computer network that is not equipped with a disk drive and that uses files stored in a file server. *See also* file server.

disk memory *n.* *See* virtual memory.

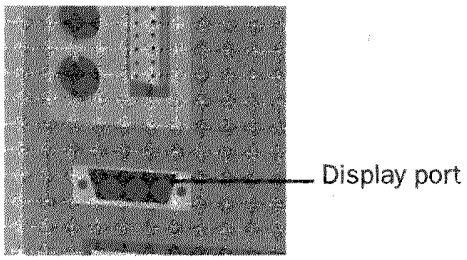
disk mirroring *n.* A technique in which all or part of a hard disk is duplicated onto one or more other hard disks, each of which ideally is attached to its own controller. With disk mirroring, any change made to the original disk is simultaneously made to the other disks, so that if the original disk becomes damaged or corrupted, the mirror disks will contain a current, undamaged collection of the data from the original disk. *Also called* disk duplexing. *See also* fault tolerance.

disk operating system *n.* *See* DOS.

disk pack *n.* A collection of disks in a protective container. Used primarily with minicomputers and mainframe computers, a disk pack is a removable medium, generally a stack of 14-inch disks in a plastic housing.

disk partition *n.* A logical compartment on a physical disk drive. A single disk might have two or more logical disk partitions, each of which would be referenced with a different disk drive name. Multiple partitions are divided into a primary (boot) partition and one or more extended partitions.

display port *n.* An output port on a computer that provides a signal for a display device such as a video monitor. See the illustration. *Also called* monitor port.



Display port.

Display PostScript *n.* An extended version of the PostScript language, intended to provide a device-independent language for displaying images and text on bitmapped displays. *See also* PostScript.

Display Power Management Signaling *n. See* DPMS.

display screen *n.* The part of a video unit on which images are shown. *See also* CRT.

display terminal *n. See* terminal (definition 1).

distance learning *n.* Broadly, any educational or learning process or system in which the teacher/instructor is separated geographically or in time from his or her students; or in which students are separated from other students or educational resources. Contemporary distance learning is effected through the implementation of computer and electronics technology to connect teacher and student in either real or delayed time or on an as-needed basis. Content delivery may be achieved through a variety of technologies, including satellites, computers, cable television, interactive video, electronic transmissions via telephone lines, the World-Wide Web and other Internet technology, and others. Distance learning does not preclude traditional learning processes; frequently it is used in conjunction with in-person classroom or professional training procedures and practices.

Distance Vector Multicast Routing Protocol *n.* An Internet routing protocol that provides an efficient mechanism for connectionless datagram delivery to a group of hosts across an Internet network. It is a distributed protocol that dynamically generates IP multicast delivery trees using a technique called Reverse Path Multicasting (RPM). *Acronym:* DVMRP.

distortion *n.* An undesirable change in the waveform of a signal. Distortion can occur during signal transmission, as when a radio broadcast becomes garbled, or when a signal passes through a circuit, as when a stereo system is turned up too loud. Distortion often results in loss of information. It is mainly a problem in analog signals; digital signals are not affected by moderate distortion.

distribute *vb.* To allocate among locations or facilities, as in a data-processing function that is performed by a collection of computers and other devices linked together by a network.

distributed bulletin board *n.* A collection of newsgroups distributed to all computers in a wide area network. *See also* newsgroup, Usenet.

Distributed COM \dis-tri`byo͞o-təd kom\ *n. See* DCOM.

Distributed Component Object Model *n. See* DCOM.

distributed computing *n. See* distributed processing.

Distributed Computing Environment *n.* A set of standards from the Open Group (formerly the Open Software Foundation) for development of distributed applications that can operate on more than one platform. *Acronym:* DCE. *See also* distributed processing.

distributed database *n.* A database implemented on a network. The component partitions are distributed over various nodes (stations) of the network. Depending on the specific update and retrieval traffic, distributing the database can significantly enhance overall performance. *See also* partition (definition 2).

distributed database management system *n.* A database management system capable of managing a distributed database. *Acronym:* DDBMS. *See also* distributed database.

distributed file system *n.* A file management system in which files may be located on multiple computers connected over a local or wide area network.

distributed intelligence *n.* A system in which processing ability (intelligence) is distributed among multiple computers and other devices, each of which can work independently to some degree but can also communicate with the other devices to function as part of the larger system. *See also* distributed processing.

distributed network *n.* A network in which processing, storage, and other functions are handled by separate units (nodes) rather than by a single main computer.

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distributed processing *n.* A form of information processing in which work is performed by separate computers linked through a communications network. Distributed processing is usually categorized as either plain distributed processing or true distributed processing. Plain distributed processing shares the workload among computers that can communicate with one another. True distributed processing has separate computers perform different tasks in such a way that their combined work can contribute to a larger goal. The latter type of processing requires a highly structured environment that allows hardware and software to communicate, share resources, and exchange information freely.

distributed services *n. See* BISDN.

distributed system *n.* A noncentralized network consisting of numerous computers that can communicate with one another and that appear to users as parts of a single, large, accessible "storehouse" of shared hardware, software, and data. A distributed system is conceptually the opposite of a centralized, or monolithic, system in which clients connect to a single central computer, such as a mainframe.

Distributed System Object Model *n.* IBM's System Object Model (SOM) in a shared environment, where binary class libraries can be shared between applications on networked computers or between applications on a given system. The Distributed System Object Model complements existing object-oriented languages by allowing SOM class libraries to be shared among applications written in different languages. *Acronym:* DSOM. *See also* SOM (definition 1).

distributed transaction processing *n.* Transaction processing that is shared by one or more computers communicating over a network. *Acronym:* DTP. *See also* distributed processing, transaction processing.

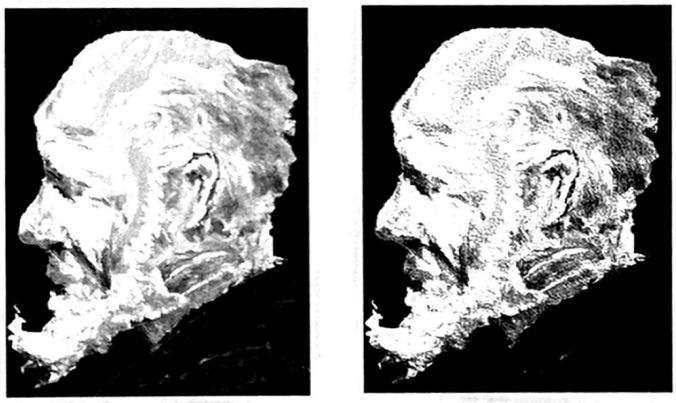
distributed workplace *n.* An environment other than the traditional office or factory, in which work is carried out on a regular basis. The flexibility afforded by the combination of communications and computing technologies enables many workers to conduct business anywhere the appropriate computer and data communications infrastructure has been set up. *See also* SOHO, telecommute.

distribution list *n.* A list of recipients on an e-mail mailing list. This can be in the form of either a mailing list program, such as LISTSERV, or an alias in an e-mail program for all recipients of an e-mail message. *See also* alias (definition 2), LISTSERV, mailing list.

distribution services *n. See* BISDN.

distributive sort *n.* An ordering process in which a list is separated into parts and then reassembled in a particular order. *See also* sort algorithm. *Compare* bubble sort, insertion sort, merge sort, quicksort.

dithering *n.* A technique used in computer graphics to create the illusion of varying shades of gray on a monochrome display or printer, or additional colors on a color display or printer. Dithering relies on treating areas of an image as groups of dots that are colored in different patterns. Akin to the print images called *halftones,* dithering takes advantage of the eye's tendency to blur spots of different colors by averaging their effects and merging them into a single perceived shade or color. Depending on the ratio of black dots to white dots within a given area, the overall effect is of a particular shade of gray. Dithering is used to add realism to computer graphics and to soften jagged edges in curves and diagonal lines at low resolutions. See the illustration. *See also* aliasing, halftone.



Dithering. A halftone image (left) and a dithered image (right) both at 72 cells per inch.

divergence *n.* A moving apart or separation. On computer displays, divergence occurs when the red, green, and blue electron beams in a color monitor do not collectively light the same spot on the screen. Within a program, such as a spreadsheet, divergence can occur when a circular set of formulas is repeatedly recalculated (iterated), with the results of each iteration moving further from a stable solution. *Compare* convergence.

divide overflow *n. See* overflow error.

(FatBit) at a time. **2.** A similar feature in any program that allows pixel-by-pixel modification through a zoom feature.

fat client *n.* In a client/server architecture, a client machine that performs most or all of the processing, with little or none performed by the server. The client handles presentation and functions, and the server manages data and access to it. *See also* client (definition 3), client/server architecture, server (definition 2), thin server. *Compare* fat server, thin client.

FAT file system *n.* The system used by MS-DOS to organize and manage files. The FAT (file allocation table) is a data structure that MS-DOS creates on the disk when the disk is formatted. When MS-DOS stores a file on a formatted disk, the operating system places information about the stored file in the FAT so that MS-DOS can retrieve the file later when requested. The FAT is the only file system MS-DOS can use; OS/2, Windows NT, and Windows 9x operating systems can use the FAT file system in addition to their own file systems (HPFS, NTFS, and VFAT, respectively). *See also* file allocation table, HPFS, NTFS, OS/2, VFAT, Windows.

father *n. See* generation (definition 1).

father file *n.* A file that is the last previously valid set of a changing set of data. The father file is immediately preceded by a grandfather file and immediately succeeded by its son. The pairs *father* and *son, parent* and *child* (or *descendant*), and *independent* and *dependent* are synonymous. *See also* generation (definition 1).

fat server *n.* In a client/server architecture, a server machine that performs most of the processing, with little or none performed by the client. Applications logic and data reside on the server, and presentation services are handled by the client. *See also* client (definition 3), client/server architecture, server (definition 2), thin client. *Compare* fat client, thin server.

fatware *n.* Software that monopolizes hard disk space and power due to an overabundance of features or inefficient design. *Also called* bloatware.

fault *n.* **1.** A physical defect, such as a loose connection, that prevents a system or device from operating as it should. **2.** A programming error that can cause the software to fail. **3.** As page fault, an attempt to access a page of virtual memory that is not mapped to a physical address. *See also* page fault.

fault tolerance *n.* The ability of a computer or an operating system to respond to a catastrophic event or fault, such as a power outage or a hardware failure, in a way that ensures that no data is lost and any work in progress is not corrupted. This can be accomplished with a battery-backed power supply, backup hardware, provisions in the operating system, or any combination of these. In a fault-tolerant network, the system has the ability either to continue the system's operation without loss of data or to shut the system down and restart it, recovering all processing that was in progress when the fault occurred.

favorite *n.* In Microsoft Internet Explorer, a user-defined shortcut to a page on the World Wide Web, analogous to a bookmark in Netscape Navigator. *See also* Favorites folder, hotlist. *Compare* bookmark (definition 2).

Favorites folder *n.* In Microsoft Internet Explorer, a collection of shortcuts to Web sites that a user has selected for future reference. Other Web browsers refer to this collection by other names, such as bookmarks or hotlists. *See also* bookmark file (definition 1), Internet Explorer, URL. *Compare* bookmark (definition 2), hotlist.

fax *n.* Short for facsimile. The transmission of text or graphics over telephone lines in digitized form. Conventional fax machines scan an original document, transmit an image of the document as a bit map, and reproduce the received image on a printer. Resolution and encoding are standardized in the CCITT Groups 1–4 recommendations. Fax images can also be sent and received by microcomputers equipped with fax hardware and software. *See also* CCITT Groups 1–4.

fax machine *n.* Short for **fa**csimile **machine**. A device that scans pages, converts the images of those pages to a digital format consistent with the international facsimile standard, and transmits the image through a telephone line. A fax machine also receives such images and prints them on paper. *See also* scan (definition 2).

fax modem *n.* A modem that sends (and possibly receives) data encoded in a fax format (typically CCITT fax format), which a fax machine or another modem decodes and converts to an image. The image must already have been encoded on the host computer. Text and graphic documents can be converted into fax format by special software usually provided with the modem; paper documents must first be

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First-Name, Address, City, State, Zip-Code, Hire-Date, Current-Salary, Title, Department, and so on. Individual fields are characterized by their maximum length and the type of data (for example, alphabetic, numeric, or financial) that can be placed in them. The facility for creating these specifications usually is contained in the data definition language (DDL). In relational database management systems, fields are called *columns*. **2.** A space in an on-screen form where the user can enter a specific item of information.

field-effect transistor *n. See* FET.

field-programmable logic array *n.* An integrated circuit containing an array of logic circuits in which the connections between the individual circuits, and thus the logic functions of the array, can be programmed after manufacture, typically at the time of installation in the field. Programming can be performed only once, typically by passing high current through fusible links on the chip. *Acronym:* FPLA. *Also called* PLA, programmable logic array.

field separator *n.* Any character that separates one field of data from another. *See also* delimiter, field (definition 1).

FIFO \fī´fō\ *n. See* first in, first out.

fifth-generation computer *n. See* computer.

fifth normal form *n.* Abbreviated 5NF. *See* normal form (definition 1).

file *n.* A complete, named collection of information, such as a program, a set of data used by a program, or a user-created document. A file is the basic unit of storage that enables a computer to distinguish one set of information from another. A file is the "glue" that binds a conglomeration of instructions, numbers, words, or images into a coherent unit that a user can retrieve, change, delete, save, or send to an output device.

file allocation table *n.* A table or list maintained by some operating systems to manage disk space used for file storage. Files on a disk are stored, as space allows, in fixed-size groups of bytes (characters) rather than from beginning to end as contiguous strings of text or numbers. A single file can thus be scattered in pieces over many separate storage areas. A file allocation table maps available disk storage space so that it can mark flawed segments that should not be used and can find and link the pieces of a file. In MS-DOS, the file allocation table is commonly known as the FAT. *See also* FAT file system.

file attribute *n.* A restrictive label attached to a file that describes and regulates its use—for example, hidden, system, read-only, archive, and so forth. In MS-DOS, this information is stored as part of the file's directory entry.

file backup *n. See* backup.

file compression *n.* The process of reducing the size of a file for transmission or storage. *See also* data compression.

file control block *n.* A small block of memory temporarily assigned by a computer's operating system to hold information about an opened file. A file control block typically contains such information as the file's identification, its location on disk, and a pointer that marks the user's current (or last) position in the file. *Acronym:* FCB.

file conversion *n.* The process of transforming the data in a file from one format to another without altering the data—for example, converting a file from a word processor's format to its ASCII equivalent. In some cases, information about the data, such as formatting, may be lost. Another, more detailed, type of file conversion involves changing character coding from one standard to another, as in converting EBCDIC characters (which are used primarily with mainframe computers) to ASCII characters. *See also* ASCII, EBCDIC.

file extension *n. See* extension (definition 1).

file extent *n. See* extent.

file format *n.* The structure of a file that defines the way it is stored and laid out on the screen or in print. The format can be fairly simple and common, as are files stored as "plain" ASCII text, or it can be quite complex and include various types of control instructions and codes used by programs, printers, and other devices. Examples include RTF (Rich Text Format), DCA (Document Content Architecture), PICT, DIF (Data Interchange Format), DXF, TIFF (Tagged Image File Format), and EPSF (Encapsulated PostScript Format).

file fragmentation *n.* **1.** The breaking apart of files as they are stored by the operating system into small, separate segments on disk. The condition is a natural consequence of enlarging files and saving them on a crowded disk that no longer contains contiguous blocks of free space large enough to hold them. File fragmentation is not an integrity problem, although it

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can eventually slow read and write access times if the disk is very full and storage is badly fragmented. Software products are available for redistributing (optimizing) file storage to reduce fragmentation. **2.** In a database, a situation in which records are not stored in their optimal access sequence because of accumulated additions and deletions of records. Most database systems offer or contain utility programs that resequence records to improve efficiency of access and to aggregate free space occupied by deleted records.

file gap *n. See* block gap.

file handle *n.* In MS-DOS, OS/2, and Windows, a token (number) that the system uses to identify or refer to an open file or, sometimes, to a device.

file-handling routine *n.* Any routine designed to assist in creating, opening, accessing, and closing files. Most high-level languages have built-in file-handling routines, although more sophisticated or complex file-handling routines in an application are often created by the programmer.

file header *n. See* header (definition 2).

file layout *n.* In data storage, the organization of records within a file. Frequently, descriptions of the record structure are also included within the file layout.

file librarian *n.* A person or process responsible for maintaining, archiving, copying, and providing access to a collection of data.

file maintenance *n.* Broadly, the process of changing information in a file, altering a file's control information or structure, or copying and archiving files. A person using a terminal to enter data, the program accepting the data from the terminal and writing it to a data file, and a database administrator using a utility to alter the format of a database file are all forms of file maintenance.

file management system *n.* The organizational structure that an operating system or program uses to order and track files. For example, a hierarchical file system uses directories in a so-called tree structure. All operating systems have built-in file management systems. Commercially available products implement additional features that provide more sophisticated means of navigating, finding, and organizing files. *See also* file system, hierarchical file system.

file manager *n.* A module of an operating system or environment that controls the physical placement of and access to a group of program files.

filename *n.* The set of letters, numbers, and allowable symbols assigned to a file to distinguish it from all other files in a particular directory on a disk. A filename is the label under which a computer user saves and requests a block of information. Both programs and data have filenames and often extensions that further identify the type or purpose of the file. Naming conventions, such as maximum length and allowable characters of a filename, vary from one operating system to another. *See also* directory, path (definition 5).

filename extension *n. See* extension (definition 1).

file protection *n.* A process or device by which the existence and integrity of a file are maintained. Methods of file protection range from allowing read-only access and assigning passwords to covering the write-protect notch on a disk and locking away floppy disks holding sensitive files.

file recovery *n.* The process of reconstructing lost or unreadable files on disk. Files are lost when they are inadvertently deleted, when on-disk information about their storage is damaged, or when the disk is damaged. File recovery involves the use of utility programs that attempt to rebuild on-disk information about the storage locations of deleted files. Because deletion makes the file's disk space available but does not remove the data, data that has not yet been overwritten can be recovered. In the case of damaged files or disks, recovery programs read whatever raw data they can find, and save the data to a new disk or file in ASCII or numeric (binary or hexadecimal) form. In some instances, however, such reconstructed files contain so much extraneous or mixed information that they are unreadable. The best way to recover a file is to restore it from a backup copy.

file retrieval *n.* The act of accessing a data file, transferring it from a storage location to the machine where it is to be used.

file server *n.* A file-storage device on a local area network that is accessible to all users on the network. Unlike a disk server, which appears to the user as a remote disk drive, a file server is a sophisticated device that not only stores files but manages them and

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maintains order as network users request files and make changes to them. To deal with the tasks of handling multiple—sometimes simultaneous—requests for files, a file server contains a processor and controlling software as well as a disk drive for storage. On local area networks, a file server is often a computer with a large hard disk that is dedicated only to the task of managing shared files. *Compare* disk server.

file sharing *n.* The use of computer files on networks, wherein files are stored on a central computer or a server and are requested, reviewed, and modified by more than one individual. When a file is used with different programs or different computers, file sharing can require conversion to a mutually acceptable format. When a single file is shared by many people, access can be regulated through such means as password protection, security clearances, or file locking to prohibit changes to a file by more than one person at a time.

file size *n.* The length of a file, typically given in bytes. A computer file stored on disk actually has two file sizes, logical size and physical size. The logical file size corresponds to the file's actual size—the number of bytes it contains. The physical size refers to the amount of storage space allotted to the file on disk. Because space is set aside for a file in blocks of bytes, the last characters in the file might not completely fill the block (allocation unit) reserved for them. When this happens, the physical size is larger than the logical size of the file.

filespec *n. See* file specification (definition 1).

file specification *n.* **1.** Abbreviated filespec. The path to a file, from a disk drive through a chain of directory files to the filename that serves to locate a particular file. **2.** A filename containing wildcard characters that indicate which files among a group of similarly named files are requested. **3.** A document that describes the organization of data within a file.

file structure *n.* A description of a file or group of files that are to be treated together for some purpose. Such a description includes file layout and location for each file under consideration.

file system *n.* In an operating system, the overall structure in which files are named, stored, and organized. A file system consists of files, directories, or folders, and the information needed to locate and access these items. The term can also refer to the portion of an operating system that translates requests for file operations from an application program into low-level, sector-oriented tasks that can be understood by the drivers controlling the disk drives. *See also* driver.

file transfer *n.* The process of moving or transmitting a file from one location to another, as between two programs or over a network.

File Transfer Protocol *n. See* FTP[1] (definition 1).

file type *n.* A designation of the operational or structural characteristics of a file. A file's type is often identified in the filename, usually in the filename extension. *See also* file format.

fill[1] *n.* In computer graphics, the colored or patterned "paint" inside an enclosed figure, such as a circle. The portion of the shape that can be colored or patterned is the fill area. Drawing programs commonly offer tools for creating filled or nonfilled shapes; the user can specify color or pattern.

fill[2] *vb.* To add color or a pattern to the enclosed portion of a circle or other shape.

film at 11 A phrase sometimes seen in newsgroups. An allusion to a brief newsbreak on TV that refers to a top news story that will be covered in full on the 11 o'clock news, it is used sarcastically to ridicule a previous article's lack of timeliness or newsworthiness. *See also* newsgroup.

film recorder *n.* A device for capturing on 35-mm film the images displayed on a computer screen.

film ribbon *n. See* carbon ribbon.

filter *n.* **1.** A program or set of features within a program that reads its standard or designated input, transforms the input in some desired way, and then writes the output to its standard or designated output destination. A database filter, for example, might flag information of a certain age. **2.** In communications and electronics, hardware or software that selectively passes certain elements of a signal and eliminates or minimizes others. A filter on a communications network, for example, must be designed to transmit a certain frequency but attenuate (dampen) frequencies above it (a lowpass filter), those below it (a highpass filter), or those above and below it (a bandpass filter). **3.** A pattern or mask through which data is passed to weed out specified items. For instance, a filter used in e-mail or in retrieving newsgroup messages can allow users to filter out messages from other users. *See also* e-mail filter, mask. **4.** In com-

flame[2] *vb.* **1.** To send an abusive or personally insulting e-mail message or newsgroup posting. **2.** To criticize personally by means of e-mail messages or newsgroup postings.

flame bait *n.* A posting to a mailing list, newsgroup, or other online conference that is likely to provoke flames, often because it expresses a controversial opinion on a highly emotional topic. *See also* flame[1], flame war. *Compare* troll.

flamefest *n.* A series of inflammatory messages or articles in a newsgroup or other online conference.

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flamer *n.* A person who sends or posts abusive messages via e-mail, in newsgroups and other online forums, and in online chats. *See also* chat[1] (definition 1), newsgroup.

flame war *n.* A discussion in a mailing list, newsgroup, or other online conference that has turned into a protracted exchange of flames. *See also* flame[1].

Flash *n.* A vector graphics file format (extension .swf) developed by Macromedia to enable designers to add animation and interactivity to multimedia Web pages. Flash files can be played back with a downloadable Shockwave plug-in or a Java program. The file format has been released by Macromedia as an open standard for the Internet.

flash *vb. See* burn.

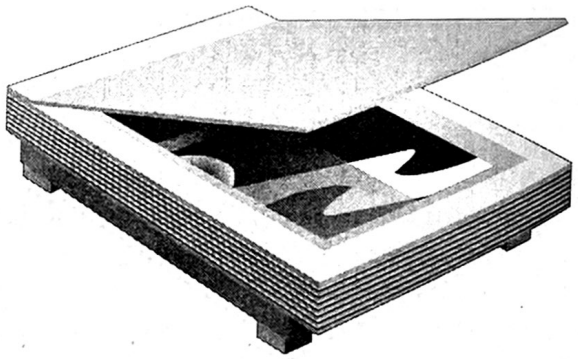
flash memory *n.* A type of nonvolatile memory. Flash memory is similar to EEPROM memory in function but it must be erased in blocks, whereas EEPROM can be erased one byte at a time. Because of its block-oriented nature, flash memory is commonly used as a supplement to or replacement for hard disks in portable computers. In this context, flash memory either is built into the unit or, more commonly, is available as a PC Card that can be plugged into a PCMCIA slot. A disadvantage of the block-oriented nature of flash memory is that it cannot be practically used as main memory (RAM) because a computer needs to be able to write to memory in single-byte increments. *See also* EEPROM, nonvolatile memory, PC Card, PCMCIA slot.

flash ROM \flash´ rom\ *n. See* flash memory.

flat address space *n.* An address space in which each location in memory is specified by a unique number. (Memory addresses start at 0 and increase sequentially by 1.) The Macintosh operating system, OS/2, and Windows NT use a flat address space. MS-DOS uses a segmented address space, in which a location must be accessed with a segment number and an offset number. *See also* segmentation. *Compare* segmented address space.

flatbed plotter *n.* A plotter in which paper is held on a flat platform and a pen moves along both axes, traveling across the paper to draw an image. This method is slightly more accurate than that used by drum plotters, which move the paper under the pen, but requires more space. Flatbed plotters can also accept a wider variety of media, such as vellum and acetate, because the material does not need to be flexible. *See also* plotter. *Compare* drum plotter, pinch-roller plotter.

flatbed scanner *n.* A scanner with a flat transparent surface that holds the image to be scanned, generally a book or other paper document. A scan head below the surface moves across the image. Some flatbed scanners can also reproduce transparent media, such as slides. See the illustration. *Compare* drum scanner, handheld scanner, sheet-fed scanner.



Flatbed scanner.

flat file *n.* A file consisting of records of a single record type in which there is no embedded structure information that governs relationships between records.

flat-file database *n.* A database that takes the form of a table, where only one table can be used for each database. A flat-file database can only work with one file at a time. *Compare* relational database.

flat file directory *n.* A directory that cannot contain subdirectories but simply contains a list of filenames. *Compare* hierarchical file system.

flat file system *n.* A filing system with no hierarchical order in which no two files on a disk may have the same name, even if they exist in different directories. *Compare* hierarchical file system.

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into effect on August 15, 1990, but was never fully implemented and was replaced by POSIT.

GOTO statement \gō´tōō stāt`mənt\ *n.* A control statement used in programs to transfer execution to some other statement; the high-level equivalent of a branch or jump instruction. Use of GOTO statements is generally discouraged, because they make it difficult not only for a programmer to trace the logic of a program but also for a compiler to generate optimized code. *See also* branch instruction, jump instruction, spaghetti code.

.gov *n.* In the Internet's Domain Name System, the top-level domain that identifies addresses operated by government agencies. The domain name .gov appears as a suffix at the end of the address. In the United States, only nonmilitary federal government agencies may use the .gov domain. State governments in the United States use the top-level domain of .state.us, with .us preceded by the two-letter abbreviation for the state, or just .us; other regional governments in the United States are registered under the .us domain. *See also* DNS (definition 1), domain (definition 3), .state.us, .us. *Compare* .com, .edu, .mil, .net, .org.

Government Open Systems Interconnection Profile *n. See* GOSIP.

GPF *n. See* General Protection Fault.

GPIB *n. See* General-Purpose Interface Bus.

GPL *n. See* General Public License.

grabber *n.* **1.** A device for capturing graphical image data from a video camera or another full-motion video source and putting it into memory. *Also called* frame grabber, video digitizer. **2.** Any device for capturing data. **3.** Software that takes a "snapshot" of the currently displayed screen image by transferring a portion of video memory to a file on disk. **4.** In some graphics-based applications, a special type of mouse pointer.

graceful exit *n.* The methodical termination of a process, even under error conditions, that allows the operating system or parent process to regain normal control, leaving the system in a state of equilibrium. This is expected behavior. *See also* fail-soft system.

grade *n.* In communications, the range of frequencies available for transmission on a single channel. For example, voice-grade telephone frequencies range from about 300 hertz (Hz) through 3,400 Hz.

grade of service *n.* The probability that a user of a shared communications network, such as a public telephone system, will receive an "all channels busy" signal. The grade of service is used as a measure of the traffic-handling ability of the network and is usually applied to a specific period, such as the peak traffic hour. A grade of service of 0.002, for example, assumes that a user has a 99.8 percent chance that a call made during the specified period will reach its intended destination.

grafPort *n.* A structure used on the Apple Macintosh to define a graphics environment with its own pen size, font, fill patterns, and so on. Each window has a grafPort, and grafPorts can be used to send graphics to off-screen windows or files.

graftal *n.* One of a family of geometric forms, similar to fractals but easier to compute. Graftals are often used in the special-effects industry to create synthetic images of structures such as trees and plants. *See also* fractal.

grammar checker *n.* A software accessory that checks text for errors in grammatical construction.

grandfather *n. See* generation (definition 1).

grandfather/father/son *adj. See* generation (definition 1).

grandparent *n. See* generation (definition 2).

granularity *n.* A description, from "coarse" to "fine," of a computer activity or feature (such as screen resolution, searching and sorting, or time slice allocation) in terms of the size of the units it handles (pixels, sets of data, or time slices). The larger the pieces, the coarser the granularity.

graph *n.* **1.** In programming, a data structure consisting of zero or more nodes and zero or more edges, which connect pairs of nodes. If any two nodes in a graph can be connected by a path along edges, the graph is said to be connected. A subgraph is a subset of the nodes and edges within a graph. A graph is directed (a digraph) if each edge links two nodes together only in one direction. A graph is weighted if each edge has some value associated with it. *See also* node (definition 3), tree. **2.** *See* chart.

Graphical Device Interface *n. See* GDI.

graphical interface *n. See* graphical user interface.

Graphical Kernel System *n.* A computer graphics standard, recognized by ANSI and ISO, that specifies methods of describing, manipulating, storing, and

several small squares displayed around a graphical object in a drawing program. The user can move or reshape the object by clicking on a handle and dragging. See the illustration.



Handle. A computer graphics handle.

handler *n.* **1.** A routine that manages a common and relatively simple condition or operation, such as error recovery or data movement. **2.** In some object-oriented programming languages that support messages, a subroutine that processes a particular message for a particular class of objects. *See also* message, object-oriented programming.

handshake *n.* A series of signals acknowledging that communication or the transfer of information can take place between computers or other devices. A hardware handshake is an exchange of signals over specific wires (other than the data wires), in which each device indicates its readiness to send or receive data. A software handshake consists of signals transmitted over the same wires used to transfer data, as in modem-to-modem communications over telephone lines.

hands-on *adj.* Involving interactive work with a computer or a computer program. A hands-on tutorial, for example, would teach a skill (such as the use of a program) by means of practice sessions and question-and-answer dialogues.

handwriting recognition *n.* **1.** The ability of a computer to identify a user by recognizing features of handwriting, especially a signature. **2.** The ability of a computer to translate handwritten text into character data for input. This technology is still under considerable development, and most handwriting recognition programs require users to form letters and words in a very consistent and clear manner to work adequately. The development of handwriting recognition programs has been spurred by PDAs, which frequently have keyboards that are too small for data entry, and software designed for Asian markets that have languages with numerous characters, which makes keyboards a cumbersome method for entering text. *See also* PDA. *Compare* optical character recognition.

hang *vb.* To stop responding. A hung program or computer system does not respond to user input, but the screen looks as if everything is running normally. The program or system might be waiting for something, for example, information from a network, or it might have terminated abnormally. It might resume running normally on its own, or the user might need to terminate and restart the program or reboot the computer. A hung computer system is said to be locked up. *See also* crash[2] (definition 1).

hanging indent *n.* Placement of the beginning of the first line of a paragraph farther to the left than the subsequent lines. *Also called* outdent. *Compare* indent.

hard *adj.* **1.** Permanent, fixed, or physically defined; unchangeable by the ordinary operation of a computer system. *See also* hard copy, hard error, hard return, hard-sectored disk. *Compare* soft (definition 1). **2.** Retaining magnetization even in the absence of an external magnetic field. *Compare* soft (definition 2).

hard card *n.* A circuit board, carrying a hard disk and containing its controller, that plugs into an expansion slot and uses the expansion bus for power as well as for data and control signals. By contrast, a hard disk in a drive bay communicates with a separate controller card by a ribbon cable and has a direct cable to the computer's main power supply. *See also* controller, drive bay, expansion slot, ribbon cable.

hard-coded *adj.* **1.** Designed to handle a specific situation only. **2.** Depending on values embedded in the program code rather than on values that can be input and changed by the user.

hard copy *n.* Printed output on paper, film, or other permanent medium. *Compare* soft copy.

hard disk *n.* A device containing one or more inflexible platters coated with material in which data can be recorded magnetically, together with their read/write heads, the head-positioning mechanism, and the spindle motor in a sealed case that protects against outside contaminants. The protected environment allows the head to fly 10 to 25 millionths of an inch above the surface of a platter rotating typically at 3,600 to 7,200 rpm; therefore, much more data can be stored and accessed much more quickly than on a floppy disk. Most hard disks contain from two to eight platters. See the illustration. *Also called* hard disk drive. *Compare* floppy disk.

hard disk drive *n.* *See* hard disk.

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can return to it by entering the command *cd* (change directory) without a pathname. The user's files will ordinarily be stored in the home directory and its descendants.

homegrown software *n.* Software developed by an individual at home rather than in a professional environment. Most public-domain and shareware programs are created this way.

Home key *n.* A key, found on most keyboards, whose function usually involves sending the cursor to some type of home position in an application. *See also* home.

home office *n.* **1.** An office set up within a residence. **2.** The main headquarters of a company.

home page *n.* **1.** A document intended to serve as a starting point in a hypertext system, especially the World Wide Web. A home page is called a *start page* in Microsoft Internet Explorer. **2.** An entry page for a set of Web pages and other files in a Web site. **3.** A personal Web page, usually for an individual.

home record *n. See* header record.

homogeneous environment *n.* A computing milieu, usually within an organization, in which only one manufacturer's hardware and one manufacturer's software are used. *Compare* heterogeneous environment.

homogeneous network *n.* A network on which all the hosts are similar and only one protocol is used.

hook *n.* A location in a routine or program in which the programmer can connect or insert other routines for the purpose of debugging or enhancing functionality.

hop *n.* In data communications, one segment of the path between routers on a geographically dispersed network. A hop is comparable to one "leg" of a journey that includes intervening stops between the starting point and the destination. The distance between each of those stops (routers) would be a communications hop.

horizontal blanking interval *n. See* blanking, horizontal retrace.

horizontal flyback *n. See* horizontal retrace.

horizontal market *n.* A broad category of business activity, such as accounting or inventory control, that carries across many types of business. *Compare* vertical market.

horizontal market software *n.* Application programs, such as word processors, that can be used in all types of business, as opposed to those geared for a certain industry.

horizontal retrace *n.* The movement of the electron beam in a raster-scan video display from the right end of one scan line to the left end (the beginning) of the next. During horizontal retrace, the electron beam is turned off, so the time required for the beam to move is called the horizontal blanking interval. *See also* blanking. *Compare* vertical retrace.

horizontal scrolling *n.* A feature of programs such as word processors and spreadsheets that enables the user to scroll left and right to display information beyond the horizontal limits of the screen (or window, in a graphical user interface).

horizontal synchronization *n.* On raster displays, the timing produced by a signal that controls the sweep of the display's electron beam as it moves from left to right and back again to form an image line by line. The horizontal synchronization signal is usually controlled by a circuit known as a phase-locked loop, which maintains a constant precise frequency so that a clear image is formed.

host[1] *n.* **1.** The main computer in a mainframe or minicomputer environment, that is, the computer to which terminals are connected. **2.** In PC-based networks, a computer that provides access to other computers. **3.** On the Internet or other large networks, a server computer that has access to other computers on the network. A host computer provides services, such as news, mail, or data, to computers that connect to it.

host[2] *vb.* To provide services to client computers that connect from remote locations—for example, to offer Internet access or to be the source for a news or mail service.

host adapter *n.* A device for connecting a peripheral to the main computer, typically in the form of an expansion card. *Also called* controller, host bus adapter.

host language *n.* **1.** The machine language of a CPU. **2.** A high-level language that is specifically supported by an operating system with its toolbox routines and native development systems.

host name *n.* The name of a specific server on a specific network within the Internet, leftmost in the complete host specification. For example, www.microsoft.com indicates the server called "www" within the network at Microsoft Corporation.

length of wire coiled in a cylindrical or toroidal (doughnut-shaped) form, sometimes with a ferromagnetic core. See the illustration. *Also called* choke.



Inductor. One of several kinds of inductors.

Industry Standard Architecture *n. See* ISA.

INET \I´net\ *n.* **1.** Short for **Internet**. **2.** An annual conference held by the Internet Society.

.inf *n.* The file extension for device information files, files containing scripts used to control hardware operations.

infection *n.* The presence of a virus or Trojan horse in a computer system. *See also* Trojan horse, virus, worm.

infer *vb.* To formulate a conclusion based on specific information, either by applying the rules of formal logic or by generalizing from a set of observations. For example, from the facts that canaries are birds and birds have feathers, one can infer (draw the inference) that canaries have feathers.

inference engine *n.* The processing portion of an expert system. It matches input propositions with facts and rules contained in a knowledge base and then derives a conclusion, on which the expert system then acts.

inference programming *n.* A method of programming (as in Prolog) in which programs yield results based on logical inference from a set of facts and rules. *See also* Prolog.

infinite loop *n.* **1.** A loop that, because of semantic or logic errors, can never terminate through normal means. **2.** A loop that is intentionally written with no explicit termination condition but will terminate as a result of side effects or direct intervention. *See also* loop[1] (definition 1), side effect.

infix notation *n.* A notation, used for writing expressions, in which binary operators appear between their arguments, as in 2 + 4. Unary operators usually appear before their arguments, as in –1. *See also* operator precedence, postfix notation, prefix notation, unary operator.

infobahn \in´fō-bän`\ *n.* The Internet. *Infobahn* is a mixture of the terms *information* and *Autobahn,* a German highway known for the high speeds at which drivers can legally travel. *Also called* Information Highway, Information Superhighway, the Net.

information *n.* The meaning of data as it is intended to be interpreted by people. Data consists of facts, which become information when they are seen in context and convey meaning to people. Computers process data without any understanding of what the data represents.

Information Analysis Center *n. See* IAC.

Information and Content Exchange *n. See* ICE (definition 1).

information center *n.* **1.** A large computer center and its associated offices; the hub of an information management and dispersal facility in an organization. **2.** A specialized type of computer system dedicated to information retrieval and decision-support functions. The information in such a system is usually read-only and consists of data extracted or downloaded from other production systems.

information engineering *n. See* IE (definition 1).

information explosion *n.* **1.** The current period in human history, in which the possession and dissemination of information has supplanted mechanization or industrialization as a driving force in society. **2.** The rapid growth in the amount of information available today. *Also called* information revolution.

information hiding *n.* A design practice in which implementation details for both data structures and algorithms within a module or subroutine are hidden from routines using that module or subroutine, so as to ensure that those routines do not depend on some particular detail of the implementation. In theory, information hiding allows the module or subroutine to be changed without breaking the routines that use it. *See also* break, module, routine, subroutine.

Information Highway or information highway *n. See* Information Superhighway.

information kiosk *n. See* kiosk.

information management *n.* The process of defining, evaluating, safeguarding, and distributing data within an organization or a system.

mail filter *n.* *See* e-mail filter.

mail header *n.* A block of text at the top of an e-mail message containing such information as the addresses of the sender and recipient(s), the date and time sent, the address to which a reply is to be sent, and the subject. The mail header is used by an e-mail client or program. *See also* e-mail[1] (definition 1).

mailing list *n.* A list of names and e-mail addresses that are grouped under a single name. When a user places the name of the mailing list in a mail client's To: field, the client sends the message to the machine where the mailing list resides, and that machine automatically sends the message to all the addresses on the list (possibly allowing a moderator to edit it first). *See also* LISTSERV, mailing list manager, Majordomo, moderator.

mailing list manager *n.* Software that maintains an Internet or intranet mailing list. The mailing list manager accepts messages posted by subscribers; sends copies of the messages (which may be edited by a moderator) to all the subscribers; and accepts and processes user requests, such as to subscribe or to unsubscribe to the mailing list. The most commonly used mailing list managers are LISTSERV and Majordomo. *See also* LISTSERV, mailing list, Majordomo, moderator.

mail merge *n.* A mass-mail facility that takes names, addresses, and sometimes pertinent facts about recipients and merges the information into a form letter or another such basic document.

mail reflector *n.* A newsgroup that consists simply of the messages posted to a mailing list translated into newsgroup format.

mailto *n.* A protocol designator used in the HREF of a hyperlink that enables a user to send e-mail to someone. For instance, Anne E. Oldhacker has the e-mail address aeo@baz.foo.com and an HTML document contains the code <A HREF="mailto:aeo@baz.foo.com">E-mail Anne!</A>. If a user clicks on the hyperlink "E-mail Anne!" the user's e-mail application is launched and the user can send e-mail to her without knowing her actual e-mail address. *See also* e-mail[1] (definition 1), HTML, hyperlink.

mainboard *n.* *See* motherboard.

main body *n.* The set of statements in a computer program at which execution of the program begins and that invokes the subroutines of the program.

mainframe computer *n.* A high-level, typically large and expensive computer designed to handle intensive computational tasks. Mainframe computers are characterized by their ability to simultaneously support many users connected to the computer by terminals. The name is derived from "main frame," the cabinet originally used to house the processing unit of such computers. *See also* computer, supercomputer.

main function *n.* The main body of a program written in a computer language that uses sets of functions to create an entire program. For example, the C language requires each program to contain a function called *main,* which C uses as the starting point of execution. *See also* main body.

main loop *n.* A loop in the main body of a program that performs the principal function of the program over and over until termination is somehow signaled. In event-driven programs, this loop checks for events received from the operating system and handles them appropriately. *See also* event-driven programming, main body.

main memory *n.* *See* primary storage.

main segment *n.* On the Macintosh, the principal code segment of a program, which must remain loaded throughout the execution of the program.

maintenance *n.* The process of taking measures to ensure that a hardware, software, or database system is functioning properly and is up to date.

Majordomo *n.* The name of a popular software program that manages and supports Internet mailing lists. *See also* mailing list, mailing list manager.

major geographic domain *n.* A two-character sequence in an Internet domain name address that indicates the country in which a host is located. The major geographic domain is the last part of the domain name address, following the subdomain and domain codes; for example, uiuc.edu.us indicates a host at the University of Illinois in the United States, whereas cam.ac.uk indicates a host at the University of Cambridge in the United Kingdom. The code .us, which indicates a domain in the United States, is usually omitted. See Appendix F. *Also called* country code. *See also* DNS (definition 1), domain name address.

major key *n.* *See* primary key.

male connector *n.* A type of connector that has pins for insertion into receptacles. Male connector part

own message. *See also* ActiveX controls, control (definition 2), OCX, VBX.

Message Security Protocol *n.* A protocol for Internet messages that is based on the use of encryption and verification to ensure security. It also allows for permissions at the server level for delivery or rejection of e-mail. *Acronym:* MSP.

message switching *n.* A technique used on some communications networks in which a message, with appropriate address information, is routed through one or more intermediate switching stations before being sent to its destination. On a typical message-switching network, a central computer receives messages, stores them (usually briefly), determines their destination addresses, and then delivers them. Message switching enables a network both to regulate traffic and to use communications lines efficiently. *Compare* circuit switching, packet switching.

messaging *n.* The use of computers and data communication equipment to convey messages from one person to another, as by e-mail, voice mail, or fax.

messaging application *n.* An application that enables users to send messages (such as e-mail or fax) to each other.

M

Messaging Application Programming Interface *n.* *See* MAPI.

messaging client *n.* An application program that enables its user to send or receive messages (such as e-mail or fax) to and from other users with the help of a remote server.

messaging-oriented middleware *n.* *See* MOM.

meta- *prefix* Literally, a prefix that describes a process or characteristic beyond the normal meaning of the word without the prefix. For example, metaphysics is "beyond physics." In computing, meta- is usually attached to a word to indicate that the "metaterm" describes, defines, or acts upon objects or concepts of the same type as itself. So, for example, metadata is data about data and a metatool is a tool for working on tools.

metacharacter *n.* A character embedded in a program source or a data stream that conveys information about other characters, rather than itself representing a character. A simple example is the backslash (\) character, which, when used in strings in the C programming language, indicates that the letter following the backslash is part of an escape sequence that enables C to display a nongraphic character. *See also* escape character.

metacompiler *n.* A compiler that produces compilers. The UNIX utility *yacc* (Yet Another Compiler-Compiler) is a metacompiler. If it is given a language specification, yacc produces a compiler for that language. *See also* compiler (definition 2).

Meta-Content Format *n.* An open format for describing information about content of a structured body of data such as a Web page, a set of files on a Windows desktop, or a relational database. Meta-Content Format might be used for indexes, data dictionaries, or price lists. *Acronym:* MCF.

metadata *n.* Data about data. For example, the title, subject, author, and size of a file constitute metadata about the file. *See also* data dictionary, repository.

Metadata Interchange Specification *n.* A set of specifications dealing with the exchanging, sharing, and managing of metadata. *Acronym:* MDIS. *See also* metadata.

metafile *n.* A file that contains or defines other files. Many operating systems use metafiles to contain directory information about other files on a given storage device.

metaflow *n.* One of the four stages of the data warehousing process, during which metadata (data about data) is tracked and managed; the business modeling stage. During metaflow, the operational environment is mapped to the data warehouse environment. *See also* data warehouse (definition 2), inflow, downflow, upflow, metadata.

metalanguage *n.* A language used to describe other languages. Backus-Naur form (BNF) is a metalanguage commonly used to define programming languages. *Also called* language-description language. *See also* Backus-Naur form.

metal-oxide semiconductor *n.* *See* MOS.

metal-oxide semiconductor field-effect transistor *n.* *See* MOSFET.

metaoperating system *n.* An operating system under which several other operating systems are active. *Also called* supervisor.

metatag or **meta tag** *n.* A tag in an HTML or XML document that allows a Web-page creator to include such information as the author's name, keywords identifying content, and descriptive details (for example, nontext objects on the page). The information

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routing, error control, line control, and polling (checking terminals for transmissions), leaving the main computer free for other functions. *See also* communications controller.

Network Control Protocol *n. See* Point-to-Point Protocol.

network database *n.* **1.** A database that runs in a network. **2.** A database containing the address of other users in the network. **3.** In information management, a type of database in which data records can be related to one another in more than one way. A network database is similar to a hierarchical database in the sense that it contains a progression from one record to another. It differs in being less rigidly structured: any single record can point to more than one other record and, conversely, can be pointed to by one or more records. In effect, a network database allows more than one path between any two records, whereas a hierarchical database allows only one, from parent (higher-level record) to child (lower-level record). *Compare* hierarchical database, relational database.

Network Data Management Protocol *n. See* NDMP.

network device driver *n.* Software that coordinates communication between the network adapter card and the computer's hardware and other software, controlling the physical function of the network adapter card.

Network Device Interface Specification *n. See* NDIS.

network directory *n.* On a local area network, a directory on a disk that is located on a computer other than the one the user is operating. A network directory differs from a network drive in that the user has access to only that directory. Whether the rest of the disk is accessible to the user depends on whether he or she has been granted access rights by the network administrator. On the Macintosh, a network directory is referred to as a shared folder. *Also called* networked directory, shared directory. *See also* network drive, shared folder.

network drive *n.* On a local area network, a disk drive whose disk is available to other computers on the network. Access to a network drive might not be allowed to all users of the network; many operating systems contain security provisions that enable a network administrator to grant or deny access to part or all of a network drive. *Also called* networked drive. *See also* network directory.

Network Driver Interface Specification *n. See* NDIS.

networked directory *n. See* network directory.

networked drive *n. See* network drive.

Network File System *n. See* NFS.

network information center *n. See* NIC (definition 2).

network interface card *n.* An expansion card or other device used to provide network access to a computer or other device, such as a printer. Network interface cards mediate between the computer and the physical media, such as cabling, over which transmissions travel. *Acronym:* NIC. *Also called* network adapter, network card.

network latency *n.* The time it takes for information to be transferred between computers in a network.

network layer *n.* The third of the seven layers in the ISO/OSI reference model for standardizing computer-to-computer communications. The network layer is one level above the data-link layer and ensures that information arrives at its intended destination. It is the middle of the three layers (data-link, network, and transport) concerned with the actual movement of information from one device to another. See the illustration. *See also* ISO/OSI reference model.

ISO/OSI MODEL

ISO/OSI Layer	*Focus*
Application *(highest level)*	Program-to-program transfer of information
Presentation	Text formatting and display, code conversion
Session	Establishing, maintaining, and coordinating communication
Transport	Accurate delivery, service quality
Network	Transport routes, message handling and transfer
Data-link	Coding, addressing, and transmitting information
Physical	Hardware connections

Network layer.

network meltdown *n. See* broadcast storm, meltdown.

network model *n.* A database structure, or layout, similar to a hierarchical model, except that records can have multiple parent records as well as multiple child records. A database management system that

thread. Each newsgroup has a name that consists of a series of words, separated by periods, indicating the newsgroup's subject in terms of increasingly narrow categories, such as rec.crafts.textiles.needlework. Some newsgroups can be read and posted to only on one site; others, such as those in the seven Usenet hierarchies or those in ClariNet, circulate throughout the Internet. *See also* article, bit. newsgroups, ClariNet, follow-up, Great Renaming, local newsgroups, mail reflector, threaded discussion, traditional newsgroup hierarchy, Usenet. *Compare* mailing list.

newsmaster *n.* The person in charge of maintaining the Internet news server at a particular host. Sending e-mail to "newsmaster@domain.name" is the standard way to reach a given newsmaster.

news. newsgroups *n.* Usenet newsgroups that are part of the news. hierarchy and begin with "news." These newsgroups cover topics that deal with Usenet itself, such as Usenet policy and the creation of new Usenet newsgroups. *See also* newsgroup, traditional newsgroup hierarchy, Usenet. *Compare* comp. newsgroups, misc. newsgroups, rec. newsgroups, sci. newsgroups, soc. newsgroups, talk. newsgroups.

.newsrc *n.* The file extension that identifies a setup file for UNIX-based newsreaders. The setup file typically contains a current list of newsgroups that the user subscribes to and the articles in each newsgroup that the user has already read. *See also* newsreader, setup (definition 2).

newsreader *n.* A Usenet client program that enables a user to subscribe to Usenet newsgroups, read articles, post follow-ups, reply by e-mail, and post articles. Many Web browsers also provide these functions. *See also* article, e-mail (definition 1), follow-up, newsgroup, Usenet, Web browser.

news server *n.* A computer or program that exchanges Internet newsgroups with newsreader clients and other servers. *See also* newsgroup, newsreader.

Newton *n.* A PDA developed by Apple Computer, Inc. *See also* PDA.

Newton OS *n.* The operating system that controls the Newton MessagePad personal digital assistant (PDA). *See also* PDA.

NeXT *n.* A computer designed and produced by NeXT Computer, Inc. (later NeXT Software, Inc.), a computer manufacturer and software developer founded in 1985 by Steven Jobs. NeXT was purchased by Apple Computer in 1997.

Next Generation Internet *n.* An initiative funded by the United States federal government designed to develop faster, more powerful networking technologies than are available on the current global Internet. The Next Generation Internet, or NGI, was begun in 1997 under the auspices of a number of government agencies, including DARPA (Defense Advanced Research Projects Agency), NASA (National Aeronautics & Space Administration), and the NSF (National Science Foundation). Its objective is to develop advanced networking technologies and to demonstrate them on university and government test networks running 100 to 1,000 times faster than the current Internet. The technologies developed are intended for eventual use by schools, businesses, and the general public. *Acronym* NGI. *Compare* Internet, Internet2.

NFS *n.* Acronym for **N**etwork **F**ile **S**ystem. A distributed file system developed by Sun Microsystems, Inc., that allows users of Windows NT and UNIX workstations to access remote files and directories on a network as if they were local.

NGI *n.* *See* Next Generation Internet.

nibble or **nybble** *n.* Half a byte (4 bits). *Compare* quadbit.

NIC *n.* **1.** *See* network interface card. **2.** Acronym for **n**etwork **i**nformation **c**enter. An organization that provides information about a network and other support to users of the network. The principal NIC for the Internet is InterNIC. Intranets and other private networks may have their own NICs. *See also* InterNIC.

NiCad battery *n.* *See* nickel cadmium battery.

nickel cadmium battery *n.* A rechargeable battery that uses an alkaline electrolyte. Nickel cadmium batteries typically have a longer operating life and storage life than similar lead-acid batteries. *Also called* NiCad battery. *Compare* lead ion battery, lithium ion battery, nickel metal hydride battery.

nickel metal hydride battery *n.* A rechargeable battery that offers longer life and superior performance compared with similar nickel cadmium or other alkaline batteries. *Also called* NiMH battery. *Compare* lead ion battery, lithium ion battery, nickel cadmium battery.

N

optimizer *n.* A program or device that improves the performance of a computer, network, or other device or system. For example, a disk optimizer program reduces file access time.

optimizing compiler *n.* A compiler that analyzes its output (assembly language or machine code) to produce more efficient (smaller or faster) instruction sequences.

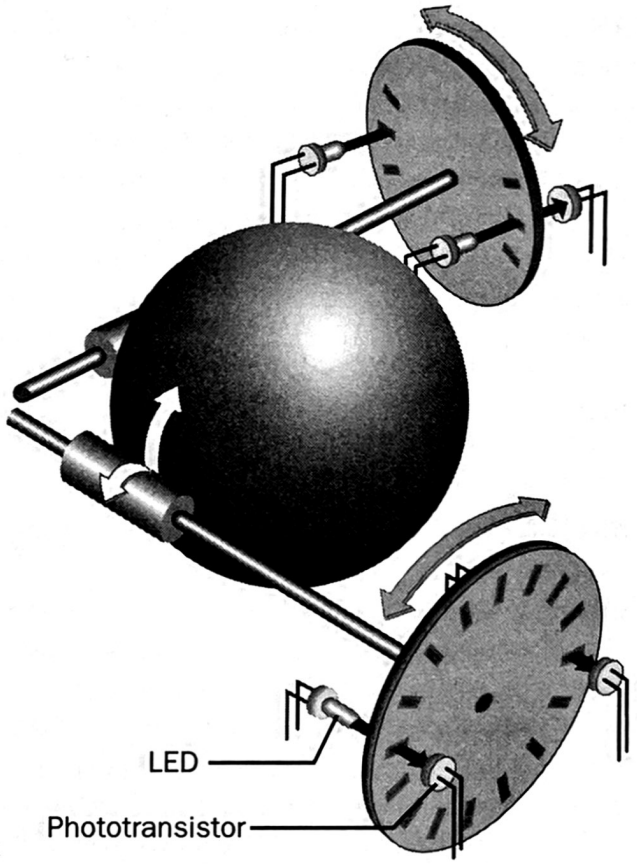
optional hyphen *n. See* hyphen.

Option key *n.* A key on Apple Macintosh keyboards that, when pressed in combination with another key, produces special characters—graphics, such as boxes; international characters, such as currency symbols; and special punctuation marks, such as en dashes and em dashes. The Option key serves a purpose similar to that of the Control key or the Alt key on IBM and compatible keyboards in that it changes the meaning of the key with which it is used.

Options *n. See* Preferences.

optoelectronics *n.* The branch of electronics in which the properties and behavior of light are studied. Optoelectronics deals with electronic devices that generate, sense, transmit, and modulate electromagnetic radiation in the infrared, visible, and ultraviolet portions of the electromagnetic spectrum.

optomechanical mouse *n.* A type of mouse in which motion is translated into directional signals through a combination of optical and mechanical means. The optical portion includes pairs of light-emitting diodes (LEDs) and matching sensors; the mechanical portion consists of rotating wheels with cutout slits. When the mouse is moved, the wheels turn and the light from the LEDs either passes through the slits and strikes a light sensor or is blocked by the solid portions of the wheels. These changes in light contact are detected by the pairs of sensors and interpreted as indications of movement. Because the sensors are slightly out of phase with one another, the direction of movement is determined based on which sensor is the first to regain light contact. Because it uses optical equipment instead of mechanical parts, an optomechanical mouse eliminates the need for many of the wear-related repairs and maintenance necessary with purely mechanical mice, but it does not require the special operating surfaces associated with optical mice. See the illustration. *See also* mouse. *Compare* mechanical mouse, optical mouse.



Optomechanical mouse.

OR \ōr\ *n.* A logical operation for combining two bits (0 or 1) or two Boolean values (false or true). If one or both values are 1 (true), it returns the value 1 (true). See the table.

Table O.1 The results of the OR logical operation.

a	b	a OR b
0	0	0
0	1	1
1	0	1
1	1	1

Orange Book *n.* **1.** A U.S. Department of Defense standards document entitled "Trusted Computer System Evaluation Criteria, DOD standard 5200.28-STD, December, 1985," which defines a system of ratings from A1 (most secure) to D (least secure), indicating the ability of a computer system to protect sensitive information. *Compare* Red Book (definition 1). **2.** A specifications book written by the Sony and Philips Corporations, covering the compact disc write-once formats (CD-R, PhotoCD). *See also* CD-R, ISO 9660, PhotoCD. *Compare* Green Book, Red Book (definition 2).

Table P.1 Types of Parity

Type	Description
Even parity	The number of 1s in each successfully transmitted set of bits must be an even number.
Odd parity	The number of 1s in each successfully transmitted set of bits must be an odd number.
No parity	No parity bit is used.
Space parity	A parity bit is used and is always set to 0.
Mark parity	A parity bit is used and is always set to 1.

parity error *n.* An error in parity that indicates an error in transmitted data or in data stored in memory. If a parity error occurs in communications, all or part of a message must be retransmitted; if a parity error occurs in RAM, the computer usually halts. *See also* parity, parity bit.

park *vb.* To position the read/write head over a portion of a disk that stores no data (and therefore can never be damaged) or beyond the surface of the disk, prior to shutting down the drive, especially in preparation for moving it. Parking can be performed manually, automatically, or by a disk utility program.

parse *vb.* To break input into smaller chunks so that a program can act upon the information.

partition *n.* **1.** A logically distinct portion of memory or a storage device that functions as though it were a physically separate unit. **2.** In database programming, a subset of a database table or file.

Partition Boot Sector *n.* The first sector in the system (startup) partition of a computer's bootable hard disk, or the first sector of a bootable floppy disk. On an x86-based computer, the Partition Boot Sector is read into memory at startup by the Master Boot Record. It is the Partition Boot Sector that contains the instructions required to begin the process of loading and starting the computer's operating system. *See also* Master Boot Record, partition table.

partition table *n.* A table of information in the first sector of a computer's hard disk that tells where each partition (discrete portion of storage) on the disk begins and ends. The physical locations are given as the beginning and ending head, sector, and cylinder numbers. In addition to these "addresses," the partition table identifies the type of file system used for each partition and identifies whether the partition is bootable— whether it can be used to start the computer. Although it is a small data structure, the partition table is a critical element on the hard disk.

Pascal \pa-skal\ *n.* A concise procedural language designed between 1967 and 1971 by Niklaus Wirth. Pascal, a compiled, structured language built upon ALGOL, simplifies syntax while adding data types and structures such as subranges, enumerated data types, files, records, and sets. *See also* ALGOL, compiled language. *Compare* C.

pass[1] *n.* In programming, the carrying out of one complete sequence of events.

pass[2] *vb.* To forward a piece of data from one part of a program to another. *See also* pass by address, pass by value.

pass by address *n.* A means of passing an argument or parameter to a subroutine. The calling routine passes the address (memory location) of the parameter to the called routine, which can then use the address to retrieve or modify the value of the parameter. *Also called* pass by reference. *See also* argument, call[1]. *Compare* pass by value.

pass by reference *n.* *See* pass by address.

pass by value *n.* A means of passing an argument or a parameter to a subroutine. A copy of the value of the argument is created and passed to the called routine. When this method is used, the called routine can modify the copy of the argument, but it cannot modify the original argument. *See also* argument, call[1]. *Compare* pass by address.

passive hub *n.* A type of hub used on ARCnet networks that passes signals along but has no additional capability. *See also* ARCnet. *Compare* active hub, intelligent hub.

passive-matrix display *n.* An inexpensive, low-resolution liquid crystal display (LCD) made from a large array of liquid crystal cells that are controlled by transistors outside of the display screen. One transistor controls an entire row or column of pixels. Passive-matrix displays are commonly used in portable computers, such as laptops and notebooks, because of their thin width. While these displays have good contrast for monochrome screens, the resolution is weaker for color screens. These displays are also difficult to view from any angle other than straight

Pentium II *n. See* Pentium.

Pentium III *n. See* Pentium.

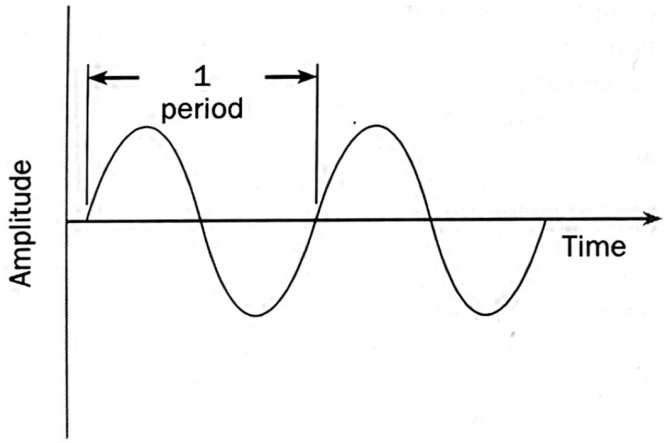
Pentium Pro *n. See* Pentium.

Pentium upgradable *n.* **1.** An i486 motherboard capable of being adapted to run a Pentium-class processor. *See also* i486DX, microprocessor, motherboard, Pentium. **2.** A 486 PC that can be upgraded to Pentium class by adding a Pentium processor. *See also* i486DX.

perfboard \pərf´bōrd\ *n.* Short for **perf**orated fiber **board.** *See* breadboard.

performance monitor *n.* A process or program that appraises and records status information about various system devices and other processes.

period *n.* The length of time required for an oscillation to complete one full cycle. For an oscillating electrical signal, the period is the time between waveform repetitions. If *f* is the frequency of oscillation in hertz, and *t* is the period in seconds, then $t = 1/f$. See the illustration.



Period. The period of an oscillating signal.

peripheral *n.* In computing, a device, such as a disk drive, printer, modem, or joystick, that is connected to a computer and is controlled by the computer's microprocessor. *Also called* peripheral device. *See also* console.

Peripheral Component Interconnect *n. See* PCI local bus.

peripheral device *n. See* peripheral.

peripheral power supply *n.* An auxiliary source of electricity used by a computer or a device as a backup in case of a power failure. *Acronym:* PPS.

Perl \pərl\ *n.* Acronym for **P**ractical **E**xtraction and **R**eport **L**anguage. An interpreted language, based on C and several UNIX utilities. Perl has powerful string-handling features for extracting information from text files. Perl can assemble a string and send it to the shell as a command; hence, it is often used for system administration tasks. A program in Perl is known as a script. Perl was devised by Larry Wall at NASA's Jet Propulsion Laboratory.

permanent storage *n.* A recording medium that retains the data recorded on it for long periods of time without power. Ink on paper is by far the most widely used permanent storage, but data can be transferred from paper to a computer only with difficulty. Typically, some form of magnetic medium, such as floppy disk or tape, is preferable. Magnetic media are generally accepted as permanent, even though the magnetic fields that encode data in the media tend to fade eventually (in five years or more). *See also* nonvolatile memory.

permanent swap file *n.* In Windows, a file composed of contiguous disk sectors used for virtual memory operations. *See also* swap file, virtual memory.

permanent virtual circuit *n. See* PVC.

permission *n.* In a networked or multiuser computer environment, the ability of a particular user to access a particular resource by means of his or her user account. Permissions are granted by the system administrator or other authorized person. Several levels of access can be given: read only; read and write (view and change); or read, write, and delete. *Also called* Access permission.

permissions log *n.* A file on a network or multiuser computer environment where permissions for users are stored. When a user attempts to access a resource on the system, the permissions log is checked to see if the user has permission to use it.

perpendicular recording *n.* A method of increasing storage capacity on magnetic media by aligning the magnetic dipoles, whose orientation determines bit values, in a direction that is perpendicular to the recording surface. *Also called* vertical recording.

persistence *n.* A characteristic of some light-emitting materials, such as the phosphors used in CRTs, that causes an image to be retained for a short while after being irradiated, as by an electron beam in a CRT. The decay in persistence is sometimes called *luminance decay.*

persistent data *n.* Data that is stored in a database or on tape so that it is retained by the computer between sessions.

to docking stations, but without the same capability for expansion and storage. *Also called* convenience adapter. *See also* docking station, port.

POS *n.* Acronym for **p**oint **o**f **s**ale. The place in a store at which goods are paid for. Computerized transaction systems, such as those in use at automated supermarkets, use scanners for reading tags and bar codes, electronic cash registers, and other special devices to record purchases at this point.

POSIT \poz´it\ *n.* Acronym for **P**rofiles for **O**pen **S**ystems **I**nternetworking **T**echnology. A set of non-mandatory standards for U.S. government network equipment. POSIT, which recognizes the prevalence of TCP/IP, is the successor to GOSIP. *See also* GOSIP, TCP/IP.

positional notation *n.* In mathematics, a form of notation whose meaning relies in part on the relative location of the elements involved. For example, common numeric notation is positional notation. In the decimal number 34, the position of the numeral 3 signifies three 10s and the position of the numeral 4 signifies four 1s.

POSIX \pō´siks\ *n.* Acronym for **P**ortable **O**perating **S**ystem **I**nterface for UNI**X**. An IEEE standard that defines a set of operating-system services. Programs that adhere to the POSIX standard can be easily ported from one system to another. POSIX was based on UNIX system services, but it was created in a way that allows it to be implemented by other operating systems.

post *vb.* To submit an article in a newsgroup or other online conference. The term is derived from the "posting" of a notice on a physical bulletin board. *See also* newsgroup.

POST *n. See* power-on self test.

posterization *n. See* contouring.

postfix notation *n.* A form of algebraic notation in which the operators appear after the operands. *Also called* reverse Polish notation. *Compare* infix notation, prefix notation.

postmaster *n.* The logon name (and therefore the e-mail address) of an account that is responsible for maintaining e-mail services on a mail server. When an account holder is having trouble with e-mail, a message to "postmaster" or "postmaster@machine.org.domain.name" will usually reach a human who can solve the problem.

post office *n.* The server and associated storage and mail handling services that provide the centralized location for collection and distribution of e-mail over a network.

Post Office Protocol *n.* A protocol for servers on the Internet that receive, store, and transmit e-mail and for clients on computers that connect to the servers to download and upload e-mail. *Acronym:* POP.

postprocessor *n.* A device or a software routine, such as a linker, that operates on data manipulated first by another processor. *See also* back-end processor (definition 2). *Compare* preprocessor.

PostScript *n.* A page-description language from Adobe Systems that offers flexible font capability and high-quality graphics. The most well-known page-description language, PostScript uses English-like commands to control page layout and to load and scale outline fonts. Adobe Systems is also responsible for Display PostScript, a graphics language for computer displays that gives users of both PostScript and Display PostScript absolute WYSIWYG (what-you-see-is-what-you-get), which is difficult when different methods are used for displaying and printing. *See also* outline font, page-description language.

PostScript font *n.* A font defined in terms of the PostScript page-description language rules and intended to be printed on a PostScript-compatible printer. PostScript fonts are distinguished from bitmapped fonts by their smoothness, detail, and faithfulness to standards of quality established in the typographic industry. *See also* PostScript. *Compare* screen font.

pot *n. See* potentiometer.

potential *n. See* electromotive force.

potentiometer *n.* A circuit element that can be adjusted to provide varying amounts of resistance. The twist-knob and slider-type volume controls on many radios and television sets are potentiometers. *Also called* pot.

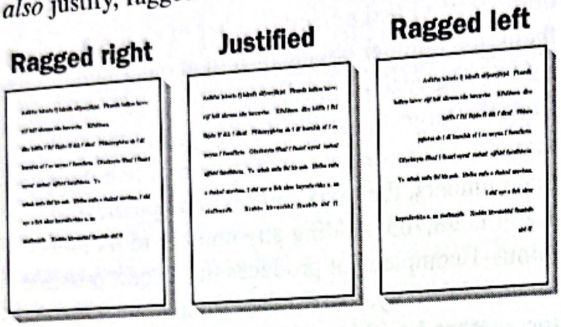
POTS \potz\ *n.* Acronym for **P**lain **O**ld **T**elephone **S**ervice. Basic dialup telephone connections to the public switched network without any added features or functions. A POTS line is nothing but a phone line connected to a simple, single-line telephone instrument.

pour *vb.* To send a file or the output from a program to another file or to a device using a pipe. *See also* pipe (definition 1).

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line. As the signal quality improves or deteriorates while a transmission line is being used, the transmission speed is adjusted accordingly. *See also* ADSL, xDSL.

rag *n.* Irregularity along the left or right edge of a set of lines of text on a printed page. Rag complements justification, in which one or both edges of the text form a straight vertical line. See the illustration. *See also* justify, ragged left, ragged right.



Rag.

ragged left *adj.* Of, relating to, or being lines of text whose left ends are not vertically aligned but form an irregular edge. Text may be right-justified and have a ragged left margin. Ragged-left text is used infrequently—typically, for visual effect in advertisements. *See also* rag, right-justify.

ragged right *adj.* Of, relating to, or being lines of text whose right ends are not vertically aligned but form an irregular edge. Letters and other word-processed documents are commonly left-justified, with ragged-right margins. *See also* left-justify, rag.

RAID \rād\ *n.* Acronym for redundant array of independent disks (formerly called redundant array of inexpensive disks). A data storage method in which data, along with information used for error correction, such as parity bits or Hamming codes, is distributed among two or more hard disks in order to improve performance and reliability. The hard disk array is governed by array management software and a disk controller, which handles the error correction. RAID is generally used on network servers. Several defined levels of RAID offer differing trade-offs among access speed, reliability, and cost. *See also* disk controller, error-correction coding, Hamming code, hard disk, parity bit, server (definition 1).

RAID array \rād´ə-rā`\ *n. See* RAID.

RAM \ram\ *n.* Acronym for random access memory. Semiconductor-based memory that can be read and written by the central processing unit (CPU) or other hardware devices. The storage locations can be accessed in any order. Note that the various types of ROM memory are capable of random access but cannot be written to. The term *RAM*, however, is generally understood to refer to volatile memory that can be written to as well as read. *Compare* core, EPROM, flash memory, PROM, ROM (definition 2).

RAMAC \ram´ak\ *n.* **1.** Acronym for Random Access Method of Accounting Control. Developed by an IBM team led by Reynold B. Johnson, RAMAC was the first computer disk drive. It was introduced in 1956. The original RAMAC consisted of a stack of 50 24-inch platters, with a storage capacity of five megabytes and an average access time of one second. **2.** A high-speed, high-capacity disk storage system introduced by IBM in 1994. Based on the original RAMAC storage device, it was designed to fulfill enterprise requirements for efficient and fault-tolerant storage.

RAM cache \ram´ kash\ *n.* Short for random access memory **cache**. Cache memory that is used by the system to store and retrieve data from the RAM. Frequently accessed segments of data may be stored in the cache for quicker access compared with secondary storage devices such as disks. *See also* cache, RAM.

RAM card *n.* Short for random access memory card. An add-in circuit board containing RAM memory and the interface logic necessary to decode memory addresses.

RAM cartridge *n. See* memory cartridge.

RAM chip *n.* Short for random access memory chip. A semiconductor storage device. RAM chips can be either dynamic or static memory. *See also* dynamic RAM, RAM, static RAM.

RAM compression *n.* Short for random access memory **compression.** This technology was an attempt by a number of software vendors to solve the problem of running out of global memory under Windows 3.*x*. Compression of the usual contents of RAM may lessen the system's need to read or write to virtual (hard disk–based) memory and thus speed up the system, as virtual memory is much slower than physical RAM. Because of the falling prices of RAM and the introduction of operating systems that handle RAM more efficiently, such as Windows 9*x*, Windows NT, and OS/2, RAM compression is generally used only on older PCs. *See also* compression, RAM, Windows.

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a database), or it can be assigned to the record to serve as a key (for example, the number 00742 assigned to the tenth record from the beginning of the database). *See also* record[1].

record structure *n.* An ordered list of the fields that compose a record, together with a definition of the domain (acceptable values) of each field. *See also* record[1].

recover *vb.* **1.** To return to a stable condition after some error has occurred. A program recovers from an error by stabilizing itself and resuming execution of instructions without user intervention. **2.** To put back into a stable condition. A computer user may be able to recover lost or damaged data by using a program to search for and salvage whatever information remains in storage. A database may be recovered by restoring its integrity after some problem has damaged it, such as abnormal termination of the database management program.

recoverable error *n.* An error that can be successfully managed by software. For example, when the user enters a number when a letter is required, the program can simply display an error message and prompt the user again.

recovery *n.* The restoration of lost data or the reconciliation of conflicting or erroneous data, after a system failure. Recovery is often achieved using a disk or tape backup and system logs. *See also* backup.

Recreational Software Advisory Council *n.* An independent, nonprofit organization established in the fall of 1994 by a group of six trade organizations, led by the Software Publishers Association. The Council's goal was to create a new, objective content-labeling rating system for recreational software and other media such as the Internet. *Acronym:* RSAC.

rectifier *n.* A circuit component that passes current flowing in one direction but stops current flowing in the other direction. Rectifiers are used to convert alternating current to direct current.

recto *n.* The right-hand page of two facing pages. A recto is characteristically an odd-numbered page. *Compare* verso.

recursion *n.* The ability of a routine to call itself. Recursion enables certain algorithms to be implemented with small, simple routines, but it does not guarantee speed or efficiency. Erroneous use of recursion can cause a program to run out of stack space during execution, causing the program, and sometimes the entire system, to crash. *See also* call[1] (definition 2), routine.

Recycle Bin *n.* A folder in Windows 9x, Windows CE, Windows NT, and Windows 2000 represented by an icon on the screen resembling a basket decorated with the recycling logo. To remove a file, the user drags its icon to the Recycle Bin. However, a file in the Recycle Bin is not actually deleted from the disk until the user opens the Recycle Bin, selects the file, and presses the Del key; until then, the user can retrieve it. *Compare* Trash.

Red Book *n.* **1.** The standards documents of the U.S. National Security Agency entitled "Trusted Network Interpretation of the Trusted Computer System Evaluation Criteria (NCSC-TG-005)" and "Trusted Network Interpretation (NCS-TG-011)." These documents define a system of ratings from A1 (most secure) to D (nonsecure), indicating the ability of a computer network to protect sensitive information. *Compare* Orange Book (definition 1). **2.** A specifications book written by the Sony and Philips corporations and endorsed by ISO, covering audio compact discs. *Compare* Green Book, Orange Book (definition 2). **3.** Telecommunications standards published by the CCITT.

red-green-blue *n. See* RGB.

redirection *n.* The process of writing to or reading from a file or device different from the one that would normally be the target or the source. For example, the MS-DOS or OS/2 command *dir >prn* redirects a directory listing from the screen to the printer. *Compare* pipe.

redirector *n.* Software on a client computer that intercepts requests for information and, when appropriate, directs them to the network. Redirectors can either be built into the client operating system or be part of an added networking package.

redlining *n.* A feature of a word processing application that marks changes, additions, or deletions made to a document by a coauthor or editor. The purpose of redlining is to produce a record of the changes made to a document during the course of its development.

redraw *n. See* refresh (definition 1).

reduce *vb.* In a graphical user interface, to decrease the size of a window. A user can reduce a window either by clicking on the appropriate button in the

instructions a computer decodes and executes. RISC architecture optimizes each of these instructions so that it can be carried out very rapidly—usually within a single clock cycle. RISC chips thus execute simple instructions more quickly than general-purpose CISC (complex instruction set computing) microprocessors, which are designed to handle a much wider array of instructions. They are, however, slower than CISC chips at executing complex instructions, which must be broken down into many machine instructions that RISC microprocessors can perform. Families of RISC chips include Sun Microsystems' SPARC, Motorola's 88000, Intel's i860, and the PowerPC developed by Apple, IBM, and Motorola. *See also* architecture, SPARC. *Compare* CISC.

RISC86 *n.* A "hybrid" microprocessor technology in which CISC (Complex Instruction Set Computing) instructions are translated into RISC (Reduced Instruction Set Computing) instructions for processing. RISC86 is designed to support the 80x86 CISC architecture while providing the speed gains characteristic of RISC technology. RISC86 was developed by NexGen and is implemented in AMD's K6 microprocessor.

Rivest-Shamir-Adleman encryption *n. See* RSA encryption.

RJ-11 connector *n. See* phone connector.

RJ-11 jack *n. See* phone connector.

RJ-45 connector *n.* Short for **R**egistered **J**ack-**45** **connector**. An eight-wire connector used to attach devices to cables. The eight wires are encased in a plastic sheath and color-coded to match corresponding slots in jacks. RJ-45 jacks are used to connect computers to LANs (local area networks) and to link ISDN (Integrated Services Digital Network) devices to NT-1 (Network Terminator 1) devices. *Also called* RJ-45 jack. *See also* ISDN.

RJ-45 jack *n. See* RJ-45 connector.

RLIN *n. See* Research Libraries Information Network.

RLL encoding *n. See* run-length limited encoding.

rlogin[1] \R`log´in\ *n.* **1.** A protocol used to log in to a networked computer in which the local system automatically supplies the user's login name. *See also* communications protocol, logon. *Compare* telnet[1]. **2.** A UNIX command in BSD UNIX that enables a user to log in to a remote computer on a network using the rlogin protocol. *See also* BSD UNIX.

rlogin[2] \R`log´in\ *vb.* To connect to a networked computer using the rlogin protocol.

RLSD *n.* Acronym for **R**eceived **L**ine **S**ignal **D**etect. *See* DCD.

RMM *See* real-mode mapper.

robopost *vb.* To post articles to newsgroups automatically, usually by means of a bot. *See also* bot (definition 3), newsgroup, post.

robot *n.* **1.** A machine that can sense and react to input and cause changes in its surroundings with some degree of intelligence, ideally without human supervision. Although robots are often designed to mimic human movements in carrying out their work, they are seldom humanlike in appearance. Robots are commonly used in manufacturing products such as automobiles and computers. *See also* robotics. **2.** *See* bot, spider.

robotics *n.* The branch of engineering devoted to the creation and training of robots. Roboticists work within a wide range of fields, such as mechanical and electronic engineering, cybernetics, bionics, and artificial intelligence, all toward the end of endowing their creations with as much sensory awareness, physical dexterity, independence, and flexibility as possible. *See also* artificial intelligence, bionics, cybernetics.

robust *adj.* Able to function or to continue functioning well in unexpected situations.

ROFL *n.* Acronym for **r**olling **o**n the **f**loor, **l**aughing. An expression, used mostly in newsgroups and online conferences, to indicate one's appreciation of a joke or other humorous circumstance. *Also called* ROTFL.

role-playing game *n.* A game that is played online such as a MUD, in which participants take on the identities of characters that interact with each other. Often these games have a fantasy or science fiction setting and have a set of rules that all players need to follow. *See also* MUD.

rollback *n.* A return to a previous stable condition, as when the contents of a hard disk are restored from a backup after a destructive hard disk error.

ROM \rom\ *n.* **1.** Acronym for **r**ead-**o**nly **m**emory. A semiconductor circuit into which code or data is permanently installed by the manufacturing process. The use of this technology is economically viable only if the chips are produced in large quantities;

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scroll arrow *n. See* scroll bar.

scroll bar *n.* In some graphical user interfaces, a vertical or horizontal bar at the side or bottom of a display area that can be used with a mouse for moving around in that area. Scroll bars often have four active areas: two scroll arrows for moving line by line, a sliding scroll box for moving to an arbitrary location in the display area, and gray areas for moving in increments of one window at a time.

scroll box *n. See* elevator.

Scroll Lock key *n.* On the IBM PC/XT and AT and compatible keyboards, a key on the top row of the numeric keypad that controls the effect of the cursor control keys and sometimes prevents the screen from scrolling. On the enhanced and Macintosh keyboards, this key is to the right of the function keys on the top row. Many modern applications ignore the Scroll Lock setting.

scroll wheel *n.* A thumbwheel on a mouse that, when turned, enables the user to scroll or zoom without clicking the scroll bar or using the keyboard. Depending on the mouse, a scroll wheel can also double as a third mouse button. *See also* scroll bar.

SCSI \skuz´ē\ *n.* Acronym for **S**mall **C**omputer **S**ystem **I**nterface, a standard high-speed parallel interface defined by the X3T9.2 committee of the American National Standards Institute (ANSI). A SCSI interface is used to connect microcomputers to SCSI peripheral devices, such as many hard disks and printers, and to other computers and local area networks. *Also called* SCSI-1, SCSI I. *Compare* ESDI, IDE.

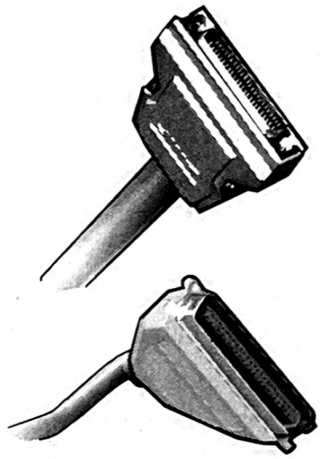
SCSI-1 \skuz´ē-wən^\ *n. See* SCSI.

SCSI-2 \skuz´ē-tyo͞o^\ *n.* An enhanced ANSI standard for SCSI (Small Computer System Interface) buses. Compared with the original SCSI standard (now called SCSI-1), which can transfer data 8 bits at a time at up to 5 MB per second, SCSI-2 offers increased data width, increased speed, or both. A SCSI-2 disk drive or host adapter can work with SCSI-1 equipment at the older equipment's maximum speed. *Also called* SCSI II. *See also* Fast SCSI, Fast/Wide SCSI, SCSI, Wide SCSI. *Compare* UltraSCSI.

SCSI bus \skuz´ē bus\ *n.* A parallel bus that carries data and control signals from SCSI devices to a SCSI controller. *See also* bus, controller, SCSI device.

SCSI chain \skuz´ē chān`\ *n.* A set of devices on a SCSI bus. Each device (except the host adapter and the last device) is connected to two other devices by two cables, forming a daisy chain. *See also* daisy chain, SCSI.

SCSI connector \skuz´ē kə-nek`tər\ *n.* A cable connector used to connect a SCSI device to a SCSI bus. See the illustration. *See also* bus, connector (definition 1), SCSI device.



SCSI connector.

SCSI device \skuz´ē də-vīs`\ *n.* A peripheral device that uses the SCSI standard to exchange data and control signals with a computer's CPU. *See also* peripheral, SCSI.

SCSI I \skuz´ē-wən^\ *n. See* SCSI.

SCSI ID \skuz´ē I-D^\ *n.* The unique identity of a SCSI device. Each device connected to a SCSI bus must have a different SCSI ID. A maximum of eight SCSI IDs can be used on the same SCSI bus. *See also* bus, SCSI device.

SCSI II \skuz´ē-tyo͞o^\ *n. See* SCSI-2.

SCSI network \skuz´ē net`wərk\ *n.* A set of devices on a SCSI bus, which acts like a local area network. *See also* SCSI.

SCSI port \skuz´ē pōrt`\ *n.* **1.** A SCSI host adapter within a computer, which provides a logical connection between the computer and all of the devices on the SCSI bus. *See also* SCSI. **2.** A connector on a device for a SCSI bus cable. *See also* SCSI.

scuzzy *n. See* SCSI.

SDH *n. See* Synchronous Digital Hierarchy.

SDK *n.* Acronym for software **d**evelopment **k**it. *See* developer's toolkit.

stepper motor *n.* A mechanical device that rotates only a fixed distance each time it receives an electrical pulse. A stepper motor is part of a disk drive.

step-rate time *n.* The time required to move a disk actuator arm from one track to the next. *See also* actuator, stepper motor.

stereogram *n.* *See* autostereogram.

StickyKeys *n.* An accessibility feature built into Macintosh computers and Windows 9x and Windows NT 4 that causes modifier keys such as Shift, Control, or Alt to "stay on" after they are pressed, eliminating the need to press multiple keys simultaneously. This feature facilitates the use of modifier keys by users who are unable to hold down one key while pressing another.

stochastic *adj.* Based on random occurrences. For example, a stochastic model describes a system by taking into account chance events as well as planned events.

stop bit *n.* In asynchronous transmission, a bit that signals the end of a character. In early electromechanical teleprinters, the stop bit provided time for the receiving mechanism to coast back to the idle position and, depending on the mechanism, had a duration of 1, 1.5, or 2 data bits. *See also* asynchronous transmission. *Compare* parity bit, start bit.

storage *n.* In computing, any device in or on which information can be kept. Microcomputers have two main types of storage: random access memory (RAM) and disk drives and other external storage media. Other types of storage include read-only memory (ROM) and buffers.

Storage Area Network *n.* *See* System Area Network.

storage device *n.* An apparatus for recording computer data in permanent or semipermanent form. When a distinction is made between primary (main) storage devices and secondary (auxiliary) storage devices, the former refers to random access memory (RAM) and the latter refers to disk drives and other external devices.

storage location *n.* The position at which a particular item can be found—either an addressed location or a uniquely identified location on a disk, tape, or similar medium.

storage media *n.* The various types of physical material on which data bits are written and stored, such as floppy disks, hard disks, tape, and optical discs.

storage tube *n.* *See* direct view storage tube.

store-and-forward *n.* A method of delivering transmissions in which messages are held temporarily by an intermediary before being sent on to their destination. Store and forward is used by some switches in delivering packets to their destinations. *Compare* cut-through switch.

stored program concept *n.* A system architecture scheme, credited largely to the mathematician John von Neumann, in which both programs and data are in direct-access storage (random access memory, or RAM), thereby allowing code and data to be treated interchangeably. *See also* von Neumann architecture.

storefront *n.* *See* virtual storefront.

storm *n.* On a network, a sudden, excessive burst of traffic. Storms are often responsible for network outages.

STP *n.* Acronym for **s**hielded **t**wisted **p**air. A cable consisting of one or more twisted pairs of wires and a sheath of foil and copper braid. The twists protect the pairs from interference by each other, and the shielding protects the pairs from interference from outside. Therefore, STP cable can be used for high-speed transmission over long distances. *See also* twisted-pair cable. *Compare* UTP.

straight-line code *n.* Program code that follows a direct sequence of statements rather than skipping ahead or jumping back via transfer statements such as GOTO and JUMP. *See also* GOTO statement, jump instruction. *Compare* spaghetti code.

stream[1] *n.* Any data transmission, such as the movement of a file between disk and memory, that occurs in a continuous flow. Manipulating a data stream is a programming task. Consumers, however, are likely to encounter references to streams and streaming in connection to the Internet, which has increased reliance on stream techniques to enable users (even those with slower equipment) to access large multimedia files—especially those containing audio and video components—and to display or play them before all the data has been transferred.

stream[2] *vb.* To transfer data continuously, beginning to end, in a steady flow. Many aspects of computing rely on the ability to stream data: file input and output, for example, and communications. If necessary, an application receiving a stream must be able to save the information to a buffer in order to prevent loss of data. On the Internet, streaming enables users

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and passwords, establishing security access levels, allocating storage space, and watching for unauthorized access to prevent virus or Trojan horse programs from entering the system. *Also called* sysadmin. *See also* Trojan horse, virus. *Compare* sysop.

System Area Network *n.* A private, sometimes high-performance network that links servers within a cluster. A System Area Network is scalable, enables the servers to communicate quickly, and ensures dependability even if a server loses its connection to the rest of the network. *Also called* Storage Area Network. *See also* cluster, Virtual Interface Architecture.

system board *n. See* motherboard.

system clock *n. See* clock (definition 1).

system console *n.* The control center of a computer system, primarily with reference to mainframe and minicomputers. In networked or distributed systems, one workstation is designated as the system administrator's; this workstation is analogous to the LAN system console. *See also* console, LAN.

system conversion *n.* Changing from one operating system to another—for example, from Windows 95 to Windows NT or UNIX or OS/2.

system development *n.* The process of defining, designing, testing, and implementing a new system.

system disk *n.* A disk that contains an operating system and can be used to boot a computer. *Also called* startup disk. *See also* boot[2], operating system.

system error *n.* A software condition that renders the operating system incapable of continuing to function normally. This type of error usually requires rebooting the system.

system failure *n.* The inability of a computer to continue functioning, usually caused by software rather than hardware.

System file *n.* A resource file on the Macintosh that contains the resources needed by the operating system, such as fonts, icons, and default dialog boxes.

System folder *n.* The Macintosh file folder (directory) that contains the System file and other vital files, such as Finder, device drivers, INIT files, and control panel files. *See also* control panel, Finder, INIT, System file.

system font *n.* On the Macintosh and in some PC applications, the font used by the computer for on-screen text, such as menu titles and items (but not on-screen text within a word processor or other application). *See also* font.

system generation *n.* The process of configuring and installing system software for a particular set of hardware components. Complex operating systems such as UNIX are shipped with device drivers and utilities that are often not relevant to a particular hardware configuration; putting together only the necessary components, as well as specifying important system characteristics, is part of the system generation process. *Also called* sysgen.

system heap *n. See* heap (definition 1).

system.ini *n.* In Windows 3.*x*, the initialization file used to store the hardware configuration information necessary to run the Windows operating environment. The system.ini file was replaced by the Registry database in Windows 9x and in Windows NT. *See also* ini file.

system life cycle *n.* An information system's useful life. At the end of a system's life cycle it is not feasible to repair or expand it, so it must be replaced.

system memory *n. See* memory.

System Object Model *n. See* SOM (definition 1).

system-on-a-chip *n.* The integration of multiple functions on a single computer chip. In addition to the incorporation of functions such as a floating-point unit, a system-on-a-chip might also include display, communications, and other components that contribute to a functional computer system.

system operator *n. See* sysop.

system prompt *n. See* prompt (definition 1).

system recovery *n.* Processing that takes place after a system failure in order to restore a system to normal operation. System recovery takes place after the operating system is initiated. It sometimes requires that tasks in process during the failure be backed out of and that structures in memory during the failure be reconstructed.

System Registry *n. See* Registry.

System Request key *n. See* Sys Req key.

system resource *n.* On the Macintosh, any of numerous routines, definitions, and data fragments that are stored in the Macintosh System file, such as floating-point arithmetic routines, font definitions, and peripheral drivers. *See also* resource (definition 2).

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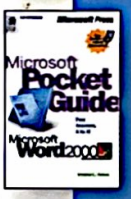
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