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B

bubble storage *n.* See bubble memory.

bucket *n.* A region of memory that is addressable as an entity and can be used as a receptacle to hold data. *See also* bit bucket.

bucket brigade attack *n.* See man-in-the-middle attack.

buffer¹ *n.* A region of memory reserved for use as an intermediate repository in which data is temporarily held while waiting to be transferred between two locations or devices. For instance, a buffer is used while transferring data from an application, such as a word processor, to an input/output device, such as a printer.

buffer² *vb.* To use a region of memory to hold data that is waiting to be transferred, especially to or from input/output (I/O) devices such as disk drives and serial ports.

buffer pool *n.* A group of memory or storage-device locations that are allocated for temporary storage, especially during transfer operations.

buffer storage *n.* **1.** The use of a special area in memory to hold data temporarily for processing until a program or operating system is ready to deal with it. **2.** An area of storage that is used to hold data to be passed between devices that are not synchronized or have different bit transfer rates.

bug *n.* **1.** An error in coding or logic that causes a program to malfunction or to produce incorrect results. Minor bugs, such as a cursor that does not behave as expected, can be inconvenient or frustrating, but do not damage information. More severe bugs can require the user to restart the program or the computer, losing whatever previous work had not been saved. Worse yet are bugs that damage saved data without alerting the user. All such errors must be found and corrected by the process known as *debugging*. Because of the potential risk to important data, commercial application programs are tested and debugged as completely as possible before release. After the program becomes available, further minor bugs are corrected in the next update. A more severe bug can sometimes be fixed with a piece of software called a *patch*, which circumvents the problem or in some other way alleviates its effects. *See also* beta test, bomb², crash² (definition 1), debug, debugger, hang, inherent error, logic error, semantic error, syntax error. **2.** A recurring physical problem that prevents a system or set of components from working together properly. While the origin of this defini-

tion is in some dispute, computer folklore attributes the first use of bug in this sense to a problem in the Harvard Mark I or the Army/University of Pennsylvania ENIAC that was traced to a moth caught between the contacts of a relay in the machine (although a moth is not entomologically a true bug).

buggy *adj.* Full of flaws, or bugs, in reference to software. *See also* bug (definition 1).

building-block principle *n.* See modular design.

built-in check *n.* See hardware check, power-on self test.

built-in font *n.* See internal font.

built-in groups *n.* The default groups provided with Microsoft Windows NT and Windows NT Advanced Server. A group defines a collection of rights and permissions for the user accounts that are its members. Built-in groups are therefore a convenient means of providing access to commonly used resources. *See also* group¹.

bulk eraser *n.* A device for eliminating all information from a storage medium, such as a floppy disk or a tape, by generating a strong magnetic field that scrambles the alignment of the ferrous materials in the media that encode stored data.

bulk storage *n.* Any medium capable of containing large quantities of information, such as tape, fixed disk, or optical disc.

bullet *n.* A typographical symbol, such as a filled or empty circle, diamond, box, or asterisk, used to set off a small block of text or each item in a list. Round and square bullets are used to set off different levels of information. *See also* dingbat.

bulletin board system *n.* See BBS.

bulletproof *adj.* Capable of overcoming hardware problems that, in another system, could lead to interruption of the task in progress.

bump mapping *n.* In 3D computer game rendering and other digital animation applications, a graphic technique in which a texture is added to the surface of an image to increase the perceived detail of the object. Bump mapping gives each pixel a texture, which is calculated by the computer's video card to respond to changes in surroundings, allowing a more realistic interpretation of objects. *See the illustration.*

the virus also changes the registry, infects the Normal.dot Word template (which, in turn, infects new documents), and, in Office 2000, disables the Word macro virus warning. Although the Melissa virus does not destroy data, it can affect e-mail performance through the increased volume of messages. If an infected document is open at a time when the day of the month is the same as the minute value of the current time, the virus inserts the text “Twenty-two points, plus triple-word-score, plus fifty points for using all my letters. Game’s over. I’m outta here” at the current location of the cursor. The virus was named after an acquaintance of the hacker who developed it.

meltdown *n.* **1.** The complete collapse of a computer network caused by a higher level of traffic than the network can support. The term refers, by analogy, to the accidental melting down of a nuclear reactor core. **2.** Colloquially, the breakdown of a person, usually in a job situation, caused by overwork, stress, or failure.

member *n.* **1.** In object-oriented programming, a variable or routine that is part of a class. *See also* C++, class. **2.** A value that is part of a set data structure. *See also* set² (definition 1).

membrane keyboard *n.* A keyboard in which an unbroken plastic or rubber shell (a membrane) covers keys that have little or no travel (movement). Rather than use normal, full-travel keys, membrane keyboards use pressure-sensitive areas that are sometimes, but not always, defined by small bumps under the membrane.

memo field *n.* A field in a database file that can contain unstructured text.

memo pad *n.* A note-taking feature offered by many personal digital assistants and other handheld computing devices. Memo pad allows for the entry of short notes via typing or handwriting recognition applications. The notes can be categorized, organized, and edited later.

memory *n.* A device where information can be stored and retrieved. In the most general sense, memory can refer to external storage such as disk drives or tape drives; in common usage, it refers only to a computer’s main memory, the fast semiconductor storage (RAM) directly connected to the processor. *See also* core, EEPROM, EPROM, flash memory, PROM, RAM, ROM. *Compare* bubble memory, mass storage.

memory bank *n.* The physical location on a motherboard where a memory module can be inserted. *See also* bank (definition 1).

memory board *n.* A plug-in printed circuit board that contains one or more memory chips. *See also* memory chip.

memory cache *n.* *See* CPU cache.

memory card *n.* A memory module that is used to extend RAM storage capacity or in place of a hard disk in a portable computer, such as a laptop, notebook, or handheld PC. The module is usually the size of a credit card and can be plugged into a PCMCIA-compliant portable computer. The module can be composed of EPROM, RAM, or ROM chips or flash memory. *Also called:* RAM card, ROM card. *See also* EPROM, flash memory, handheld PC, hard disk, memory cartridge, module (definition 2), PCMCIA, RAM, ROM.

memory cartridge *n.* A plug-in module containing RAM (random access memory) chips that can be used to store data or programs. Memory cartridges are used primarily in portable computers as smaller, lighter (but more expensive) substitutes for disk drives. Memory cartridges typically use either a nonvolatile form of RAM, which does not lose its contents when power is turned off, or battery-backed RAM, which maintains its contents by drawing current from a rechargeable battery within the cartridge. *Also called:* RAM cartridge. *See also* memory card, RAM. *Compare* ROM cartridge.

memory cell *n.* An electronic circuit that stores one bit of data. *See also* bit.

memory chip *n.* An integrated circuit devoted to memory storage. The memory storage can be *volatile* and hold data temporarily, such as RAM, or *nonvolatile* and hold data permanently, such as ROM, EPROM, EEPROM, or PROM. *See also* EEPROM, EPROM, integrated circuit, memory board, nonvolatile memory, PROM, RAM, volatile memory.

memory management *n.* **1.** In operating systems for personal computers, procedures for optimizing the use of RAM (random access memory). These procedures include selectively storing data, monitoring it carefully, and freeing memory when the data is no longer needed. Most current operating systems optimize RAM usage on their own; some older operating systems, such as early versions of MS-DOS, required the use of third-party utilities to optimize RAM usage and necessitated that the user be more

this context, such a card consists of conventional static RAM chips powered by a small battery and is designed to provide additional RAM to the system. *See also* PC Card. *Compare* flash memory.

PCMCIA device *n.* *See* PC Card.

p-code *n.* *See* pseudocode.

PCS *n.* *See* Personal Communications Services.

PCT *n.* **1.** Acronym for **p**rogram **c**omprehension **t**ool. A software engineering tool that facilitates the process of understanding the structure and/or functionality of computer programs. **2.** Acronym for **P**riate **C**ommunications **T**echnology, a protocol standard drafted by Microsoft and submitted to the IETF for consideration. PCT, like the Netscape-designed SSL (Secure Sockets Layer), supports authentication and encryption for securing privacy in Internet communications. **3.** Acronym for **P**ersonal **C**ommunications **T**echnology. An enhanced version of Secure Sockets Layer (SSL).

.pcx *n.* The file extension that identifies bitmapped images in the PC Paintbrush file format.

PC/XT *n.* The second-generation of the original IBM Personal Computer. The IBM PC/XT was introduced in 1983 and was the first of the PC computers to support hard disks. *See also* IBM PC.

PC/XT keyboard *n.* The keyboard for the PC/XT. Strong, reliable, and equipped with 83 keys, the PC/XT keyboard offers a typist an audible click. *See also* IBM PC, PC/XT.

PDA *n.* Acronym for **P**ersonal **D**igital **A**ssistant. A lightweight palmtop computer designed to provide specific functions like personal organization (calendar, note taking, database, calculator, and so on) as well as communications. More advanced models also offer multimedia features. Many PDA devices rely on a pen or other pointing device for input instead of a keyboard or mouse, although some offer a keyboard too small for touch typing to use in conjunction with a pen or pointing device. For data storage, a PDA relies on flash memory instead of

power-hungry disk drives. *See also* firmware, flash memory, handheld PC, PC Card, pen computer.

PDC *n.* *See* Primary Domain Controller.

PD-CD drive *n.* Short for **p**hase change rewritable **d**isc—**compact disc drive**. A storage device that combines a CD-ROM drive and a phase change rewritable disc (PD) drive, which can store up to 650 megabytes of data on cartridges of rewritable optical discs. *See also* phase-change recording.

PDD *n.* Acronym for **P**ortable **D**igital **D**ocument. A graphics file created from a document by QuickDraw GX under Mac OS. PDDs are stored in a form that is independent of printer resolution; they print at the highest resolution available on the printer used; and they can contain the original fonts used in the document. Therefore, a PDD can be printed by a computer other than the one on which it was created.

.pdf *n.* The file extension that identifies documents encoded in the Portable Document Format developed by Adobe Systems. To display or print a .pdf file, the user should obtain the freeware Adobe Acrobat Reader. *See also* Acrobat, Portable Document Format.

PDL *n.* *See* page-description language.

PDM *n.* *See* pulse duration modulation.

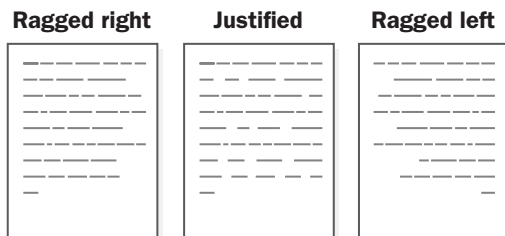
PDO *n.* *See* Portable Distributed Objects.

PDS *n.* **1.** Acronym for **P**rocessor **D**irect **S**lot. An expansion slot in Macintosh computers that is connected directly to the CPU signals. There are several kinds of PDS slots with different numbers of pins and different sets of signals, depending on which CPU is used in a particular computer. **2.** Acronym for **P**arallel **D**ata **S**tructure. A hidden file, located in the root directory of a disk that is shared under AppleShare, that contains access privilege information for folders.

Peachy virus *n.* A virus, first detected in 2001, that was the first to attempt to spread itself through PDF files. The Peachy virus takes advantage of an Adobe Acrobat feature that enables users to embed files in PDF documents. The embedded Peachy virus file infects the computer of a user

(asymmetric digital subscriber line) that is capable of adjusting transmission speed (bandwidth) based on signal quality and length of the transmission 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 *n.* Acronym for **redundant array of independent** (or **inexpensive**) **disks**. A data storage method in which data is distributed across a group of computer disk drives that function as a single storage unit. All the information stored on each of the disks is duplicated on other disks in the array. This redundancy ensures that no information will be lost if one of the disks fails. RAID is generally used on network servers where data accessibility is critical and fault tolerance is required. There are various defined levels of RAID, each offering 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 *n.* *See* RAID.

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 *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 5 megabytes and an average access time of 1 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.

Rambus DRAM *n.* *See* RDRAM.

Rambus dynamic random access memory *n.* *See* RDRAM.

RAM cache *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

top-down design *n.* A program design methodology that starts with defining program functionality at the highest level (a series of tasks) and then breaks down each task into lower-level tasks, and so on. *See also* bottom-up programming, top-down programming. *Compare* bottom-up design.

top-down programming *n.* An approach to programming that implements a program in top-down fashion. Typically, this is done by writing a main body with calls to several major routines (implemented as stubs). Each routine is then coded, calling other, lower-level, routines (also done initially as stubs). *See also* bottom-up design, stub, top-down design. *Compare* bottom-up programming.

topic drift *n.* The tendency of an online discussion to move from its original subject to other related or unrelated subjects. For example, someone in a conference devoted to television may ask about a news program; then somebody else may say something about a story on that program about food poisoning, which leads somebody else to start a general discussion on the advantages of organic fruits and vegetables.

topic group *n.* An online discussion area for participants with a common interest in a particular subject.

top-level domain *n.* In the domain-name system of Internet addresses or DNS hierarchy, any of the broadest category of names, under which all domain names fit. Top-level domains for sites in the United States include .com, .edu, .gov, .net, and .org. *See also* DNS (definition 1), major geographic domain.

top-of-file *n.* **1.** The beginning of a file. **2.** A symbol used by a program to mark the beginning of a file—the first character in the file or, in an indexed (ordered) database, the first indexed record. *Acronym:* TOF. *See also* beginning-of-file.

topology *n.* The configuration or layout of a network formed by the connections between devices on a LAN (local area network) or between two or more LANs. *See also* bus network, LAN, ring network, star network, token ring network, tree network.

top posting *n.* In e-mail and newsgroup discussions, placing new material before material quoted from earlier posts rather than after. Because top-posted messages are read out of chronological order, top-posting is considered an undesirable practice.

total bypass *n.* A communications network that uses satellite transmission to bypass both local and long-distance telephone links.

total cost of ownership *n.* Specifically, the cost of owning, operating, and maintaining a single PC; more generally, the cost to businesses and organizations of setting up and maintaining complex and far-reaching networked computer systems. Total cost of ownership includes the up-front costs of hardware and software added to later costs of installation, personnel training, technical support, upgrades, and repairs. Industry initiatives designed to lower the total cost of ownership include centralized network management and administration, as well as hardware solutions in the form of network-based computers with or without local storage and expansion capability. *Acronym:* TCO.

touch pad *n.* A variety of graphics tablet that uses pressure sensors, rather than the electromagnetics used in more expensive high-resolution tablets, to track the position of a device on its surface. *See also* absolute pointing device, graphics tablet.

touch screen *n.* A computer screen designed or modified to recognize the location of a touch on its surface. By touching the screen, the user can make a selection or move a cursor. The simplest type of touch screen is made up of a grid of sensing lines, which determine the location of a touch by matching vertical and horizontal contacts. Another, more accurate type uses an electrically charged surface and sensors around the outer edges of the screen to detect the amount of electrical disruption and pinpoint exactly where contact has been made. A third type has infrared light-emitting diodes (LEDs) and sensors around the outer edges of the screen. These LEDs and sensors create an invisible infrared grid, which the user's finger interrupts, in front of the screen. *Compare* light pen.

touch-sensitive display *n.* *See* touch screen.

touch-sensitive tablet *n.* *See* touch pad.

touch tone dialing *n.* The signaling system used in telephones with touch-tone keypads, in which each digit is associated with two specific frequencies. During dialing, these frequencies—for example, 1336 Hz and 697 Hz for the number 2—are transmitted to the telephone company. *Also called:* DTMF, Dual Tone Multiple Frequency.

tower *n.* A microcomputer system in which the cabinet for the central processing unit (CPU) is tall, narrow, and

altered after it has been recorded. WORMs are high-capacity storage devices. Because they cannot be erased and rerecorded, they are suited to storing archives and other large bodies of unchanging information. *See also* compact disc.

WOSA *n.* Acronym for **Windows Open Services Architecture**, also known as **Windows Open System Architecture**. A set of application programming interfaces from Microsoft that is intended to enable Windows-based applications from different vendors to communicate with each other, such as over a network. The interfaces within the WOSA standard include Open Database Connectivity (ODBC), the Messaging Application Programming Interface (MAPI), the Telephony Application Programming Interface (TAPI), Windows Sockets (Winsock), and Microsoft Remote Procedure Calls (RPC). *See also* MAPI, ODBC, remote procedure call, TAPI, Winsock.

.wp *n.* A file extension used to identify files formatted for the WordPerfect word processor.

WP *n.* *See* word processing.

WPS *n.* *See* Workplace Shell.

WRAM *n.* Acronym for **window random access memory**. A type of RAM used in video adapters. Like video RAM (VRAM), WRAM allows the screen to be repainted while a graphical image is being written, but WRAM is faster. *Compare* video RAM.

wrap around *vb.* To continue movement, as with the cursor or a search operation, to the beginning or to a new starting point rather than stopping when the end of a series is reached. For example, the screen cursor might wrap around to the first column of the next line rather than stopping when it reaches the last column of the current line. Likewise, a program starting a search or replace operation in the middle of a document might be instructed to wrap around to the beginning rather than stop when it reaches the end of the document.

wrapper *n.* In the Java programming language, an object that encapsulates and delegates to another object with the aim of altering its behavior or interface. *See also* Java, object.

.wri *n.* The file format that identifies document files in the Microsoft Write format.

wrist support *n.* A device placed in front of a computer keyboard to support the wrists in an ergonomically neutral position, thereby safeguarding against repetitive strain injuries, such as carpal tunnel syndrome. *Also called:* wrist rest. *See also* carpal tunnel syndrome, repetitive strain injury.

write¹ *n.* A transfer of information to a storage device, such as a disk, or to an output device, such as a monitor or a printer. For example, a disk write means that information is transferred from memory to storage on disk. *See also* output¹. *Compare* read¹.

write² *vb.* To transfer information either to a storage device, such as a disk, or to an output device, such as a monitor or a printer. Writing is the means by which a computer provides the results of processing. A computer can also be said to write to the screen when it displays information on the monitor. *See also* output¹. *Compare* read¹.

write access *n.* A privilege on a computer system that allows a user to save, change, or delete stored data. Write access is usually set by the system administrator for a networked or server system and by the owner of the computer for a stand-alone machine. *See also* access privileges.

write-back cache *n.* A type of cache with the following feature: when changes are made to cached data, they are not simultaneously made to the original data as well. Instead, the changed data is marked, and the original data is updated when the cached data is deallocated. A write-back cache can perform more quickly than a write-through cache. But in some contexts, differences between cached and original data could lead to problems, and write-through caches must be used. *See also* cache. *Compare* write-through cache.

write-behind cache *n.* A form of temporary storage in which data is held, or cached, for a short time in memory before being written on disk for permanent storage. Caching improves system performance in general by reducing the number of times the computer must go through the relatively slow process of reading from and writing to disk. *See also* CPU cache, disk cache.

write cache *n.* *See* write-behind cache.

write error *n.* An error encountered while a computer is in the process of transferring information from memory to storage or to another output device. *Compare* read error.

write mode *n.* In computer operation, the state in which a program can write (record) information in a file. In write mode, the program is permitted to make changes to existing information. *Compare* read-only.

write protect *vb.* To prevent the writing (recording) of information, usually on a disk. Either a floppy disk or an individual file on a floppy disk or a hard disk can be