



The Ultimate Computer Reference



CD-ROM
Included



*The Comprehensive Standard for
Business, School, Library, and Home*



Microsoft Press® **Computer Dictionary** Third Edition

- **Over 300 illustrations and diagrams**
- **Extensive Internet coverage**
- **Featured in Microsoft® Bookshelf®**
- **Covers software, hardware, concepts, and more!**



Microsoft® Press



Microsoft Press

Computer Dictionary

Third Edition

Microsoft® Press

PUBLISHED BY
Microsoft Press
A Division of Microsoft Corporation
One Microsoft Way
Redmond, Washington 98052-6399

Copyright © 1997 by Microsoft Corporation

All rights reserved. No part of the contents of this book may be reproduced or transmitted in any form or by any means without the written permission of the publisher.

Library of Congress Cataloging-in-Publication Data
Microsoft Press Computer Dictionary. -- 3rd ed.

p. cm.

ISBN 1-57231-446-X

1. Computers--Dictionaries. 2. Microcomputers--Dictionaries.

I. Microsoft Press.

QA76.15.M54 1997

004'.03--dc21

97-15489

CIP

Printed and bound in the United States of America.

3 4 5 6 7 8 9 QMQM 2 1 0 9 8

Distributed to the book trade in Canada by Macmillan of Canada, a division of Canada Publishing Corporation.

A CIP catalogue record for this book is available from the British Library.

Microsoft Press books are available through booksellers and distributors worldwide. For further information about international editions, contact your local Microsoft Corporation office. Or contact Microsoft Press International directly at fax (425) 936-7329.

Macintosh, Power Macintosh, QuickTime, and TrueType are registered trademarks of Apple Computer, Inc. Intel is a registered trademark of Intel Corporation. DirectInput, DirectX, Microsoft, Microsoft Press, MS-DOS, Visual Basic, Visual C++, Win32, Win32s, Windows, Windows NT, and XENIX are registered trademarks and ActiveMovie, ActiveX, and Visual J++ are trademarks of Microsoft Corporation. Java is a trademark of Sun Microsystems, Inc. Other product and company names mentioned herein may be the trademarks of their respective owners.

Acquisitions Editor: Kim Fryer

Project Editor: Maureen Williams Zimmerman, Anne Taussig

Technical Editors: Dail Magee Jr., Gary Nelson, Jean Ross, Jim Fuchs, John Conrow, Kurt Meyer,
Robert Lyon, Roslyn Lutsch

optimum performance. Peripherals can be connected while the computer is running (*hot plugging*) and are automatically assigned a unique address (auto-addressing). Developed by Digital Equipment Corporation, the ACCESS.bus competes with Intel's USB. *See also* bidirectional, bus, daisy chain, hot plugging, input/output port, peripheral. *Compare* USB.

access code \ak'ses kōd\ *n.* *See* password.

access control \ak'ses kən-trōl\ *n.* The mechanisms for limiting access to certain items of information or to certain controls based on users' identity 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 \ak'ses kən-trōl 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 (A`C-L`).

accessibility \ak-ses`ə-bil`ə-tē\ *n.* The quality of a system incorporating hardware or software that makes it usable by people with one or more physical disabilities, such as restricted mobility, blindness, or deafness.

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

access method \ak'ses meth`əd\ *n.* *See* access mechanism (definition 3).

access number \ak'ses num`bər\ *n.* The telephone number used by a subscriber to gain access to an online service.

accessory \ak-ses`ər-ē\ *n.* *See* peripheral.

access path \ak'ses path\ *n.* The route followed by an operating system to find the location of a stored file. The access path begins with a drive or volume (disk) designator, continues through a chain of directories and subdirectories, if any, and

ends with the filename. C:\books\diction\start.exe is an example of an access path.

access privileges \ak'ses priv`ə-lə-jəz, priv`lə-jəz\ *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. *See also* file protection, file server, permission, system administrator, write access.

access provider \ak'ses prə-vī`dər\ *n.* *See* ISP.

access rights \ak'ses rīts\ *n.* The permission to view, enter, or modify a file, folder, or system.

access speed \ak'ses spēd\ *n.* *See* access time.

access time \ak'ses tīm\ *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 \ə-kount\ *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.** A record kept by local area networks and multi-user operating systems for each authorized user of the system for identification, administration, and security purposes.

accounting file \ə-koun`tēng fīl\ *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 \ə-koun`tēng mə-shēn\ *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

flicts that lower the performance of the system, make some programs inoperable, or crash the computer. *See also* boot¹, crash² (definition 1), operating system.

clean install \klēn` in-stäl` \ *n.* Reinstallation of software in a manner that ensures that no application or system files from a previous installation will remain. The procedure prevents “smart” installer programs from skipping file installations where a file already exists, which could potentially keep a problem from being removed.

clean interface \klēn` in-tər-fās` \ *n.* A user interface with simple features and intuitive commands. *See also* user interface.

clean room \klēn` rōōm` \ *n.* A room in which dust and other small particles are filtered from the air and in which protective clothing is worn to avoid contaminating electronic components and other delicate, sensitive equipment.

Clear key \klēr` kē` \ *n.* A key in the upper left corner of the numeric keypad on some keyboards. In many applications, it clears the currently selected menu choice or deletes the current selection.

Clear To Send \klēr` tə send` \ *n.* *See* CTS.

click \klik` \ *vb.* To press and release a mouse button once without moving the mouse. Clicking is usually performed to select or deselect an item or to activate a program or program feature. *See also* right click. *Compare* double-click, drag.

clickable maps \klik` ə-bl maps` \ *n.* *See* image map.

click speed \klik` spēd` \ *n.* The maximum interval between the first and second time a user presses a button on a mouse or other pointing device that will still identify these actions as a double-click to the computer as opposed to two single-clicks. *See also* double-click, mouse, pointing device.

clickstream \klik` strēm` \ *n.* The path a user takes while browsing a Web site. Each distinct selection made on a Web page adds one click to the stream. The further down the clickstream the user goes without finding the sought item, the more likely he or she is to depart to another Web site. Analysis of usage patterns helps Web site designers create user-friendly site structures, links, and search facilities. *See also* Web site.

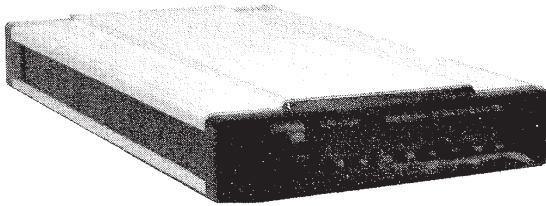
client \klī` ənt` \ *n.* **1.** In object-oriented programming, a member of a class (group) that uses the

services of another class to which it is not related. *See also* inheritance (definition 1). **2.** A process, such as a program or task, that requests a service provided by another program—for example, a word processor that calls on a sort routine built into another program. The client process uses the requested service without having to “know” any working details about the other program or the service itself. *Compare* child (definition 1), descendant (definition 2). **3.** On a local area network or the Internet, a computer that accesses shared network resources provided by another computer (called a *server*). *See also* client/server architecture, server.

client error \klī` ənt ār` ər` \ *n.* A problem reported by the Hypertext Transfer Protocol (HTTP) client module as the result of difficulty in interpreting a command or the inability to connect properly to a remote host.

client/server architecture \klī` ənt-sər-vər ār` kə-tek-chur` \ *n.* An arrangement used on local area networks that makes use of distributed intelligence to treat both the server and the individual workstations as intelligent, programmable devices, thus exploiting the full computing power of each. This is done by splitting the processing of an application between two distinct components: a “front-end” client and a “back-end” server. The client component is a complete, stand-alone personal computer (not a “dumb” terminal), and it offers the user its full range of power and features for running applications. The server component can be a personal computer, a minicomputer, or a mainframe that provides the traditional strengths offered by minicomputers and mainframes in a time-sharing environment: data management, information sharing between clients, and sophisticated network administration and security features. The client and server machines work together to accomplish the processing of the application being used. Not only does this increase the processing power available over older architectures but it also uses that power more efficiently. The client portion of the application is typically optimized for user interaction, whereas the server portion provides the centralized, multiuser functionality. *See also* distributed intelligence.

data/fax modem \dā'tə-faks' mō'dəm, dat'əl n. A modem that can handle both serial data and facsimile images to either send or receive transmissions. See the illustration.



Data/fax modem.

data field \dā'tə fēld', dat'əl n. A well-defined portion of a data record, such as a column in a database table.

data field masking \dā'tə fēld ma'skēng, dat'əl n. The process of filtering or selecting part of a data field to control the way it is returned and displayed.

data file \dā'tə fīl', dat'əl n. A file consisting of data in the form of text, numbers, or graphics, as distinct from a program file of commands and instructions. *Compare* program file.

data flow or **dataflow** \dā'tə flō', dat'əl n. **1.** The movement of data through a system, from entry to destination. **2.** In parallel processing, a design in which a calculation is made either when all necessary data is available (data-driven processing) or when other processors request the data (demand-driven processing). *See also* parallel processing.

data fork \dā'tə fōrk', dat'əl n. In Macintosh files, the part of a stored document that contains user-supplied information, such as the text of a word-processing document. A Macintosh file can have a data fork, a resource fork (which contains information such as program code, font data, digitized sound, or icons), and a header. All three parts are used by the operating system in file management and storage. *See also* resource (definition 2), resource fork.

data format \dā'tə fōr'mat, dat'əl n. The structure applied to data by an application program to provide a context in which the data can be interpreted.

data frame \dā'tə frām', dat'əl n. A packet of information transmitted as a unit on a network. Data frames are defined by the network's data-

link layer and exist only on the wire between network nodes. *See also* data-link layer, frame (definition 2).

data glove \dā'tə gləv', dat'əl n. A data input device or controller in the form of a glove fitted with sensors that convert movement of the hand and fingers into commands. *See also* virtual reality.

datagram \dā'tə-gram', dat'ə-gram' n. One packet, or unit, of information, along with relevant delivery information such as the destination address, that is sent through a packet-switching network. *See also* packet switching.

data independence \dā'tə in-də-pen'dəns, dat'əl n. The separation of data in a database from the programs that manipulate it. Data independence makes stored data as accessible as possible.

data integrity \dā'tə in-te'grə-tē, dat'əl n. The accuracy of data and its conformity to its expected value, especially after being transmitted or processed.

data interchange format \dā'tə in'tər-chānj fōr-mat, dat'əl n. A format consisting of ASCII codes in which database, spreadsheet, and similar documents can be structured to facilitate their use by and transfer to other programs. *Acronym:* DIF (D'I-F'). *See also* ASCII.

data item \dā'tə ī'təm, dat'əl n. *See* data element.

data library \dā'tə lī'brār-ē, dat'əl n. A cataloged collection of data files on disk or in another storage medium.

data link \dā'tə lēnk', dat'əl n. A connection between any two devices capable of sending and receiving information, such as a computer and a printer or a main computer and a terminal. Sometimes the term is extended to include equipment, such as a modem, that enables transmission and receiving. Such devices follow protocols that govern data transmission. *See also* communications protocol, data-link layer, DCE, DTE.

data link escape \dā'tə lēnk' ə-skāp', dat'əl n. In data transmission, a control character that changes the meaning of the characters immediately following it.

data-link layer \dā'tə-lēnk lâ'r, dat'ə-, lā'ər' n. The second of seven layers in the ISO/OSI model for standardizing computer-to-computer communications. The data-link layer is one layer above the physical layer. Its concern is packaging and



addressing data and managing the flow of transmissions. It is the lowest of the three layers (data-link, network, and transport) involved in actually moving data between devices. *See also* ISO/OSI model.

data management \dā'tə man'əj-mənt, dat'ə\ *n.* The control of data from acquisition and input through processing, output, and storage. In microcomputers, hardware manages data by gathering it, moving it, and following instructions to process it. The operating system manages the hardware and ensures that the parts of the system work in harmony so that data is stored safely and accurately. Application programs manage data by receiving and processing input according to the user's commands, and sending results to an output device or to disk storage. The user also is responsible for data management by acquiring data, labeling and organizing disks, backing up data, archiving files, and removing unneeded material from the hard disk.

data manipulation \dā'tə mə-ni'pyə-lā'shən, dat'ə\ *n.* The processing of data by means of programs that accept user commands, offer ways to handle data, and tell the hardware what to do with the data.

data manipulation language \dā'tə mə-ni'pyə-lā'shən lang'wəj, dat'ə\ *n.* In database management systems, a language that is used to insert data in, update, and query a database. Data manipulation languages are often capable of performing mathematical and statistical calculations that facilitate generating reports. *Acronym:* DML (D`M-L'). *See also* structured query language.

data mart \dā'tə märt', dat'ə\ *n.* A scaled-down version of a data warehouse that is tailored to contain only information likely to be used by the target group. *See also* data warehouse.

data medium \dā'tə mē'dē-um, dat'ə\ *n.* The physical material on which computer data is stored.

data migration \dā'tə mī-grā'shən, dat'ə\ *n.* **1.** The process of moving data from one repository or source, such as a database, to another, usually via automated scripts or programs. Often data migration involves transferring data from one type of computer system to another. **2.** In supercomputing applications, the process of storing large

amounts of data offline while making them appear to be online as disk-resident files.

data mining \dā'tə mī'nēng, dat'ə\ *n.* The process of identifying commercially useful patterns or relationships in databases or other computer repositories through the use of advanced statistical tools.

data model \dā'tə mod'əl, dat'ə\ *n.* A collection of related object types, operators, and integrity rules that form the abstract entity supported by a database management system (DBMS). Thus, one speaks of a relational DBMS, a network DBMS, and so on, depending on the type of data model a DBMS supports. In general, a DBMS supports only one data model as a practical rather than a theoretical restriction.

data network \dā'tə net'wərk, dat'ə\ *n.* A network designed for transferring data encoded as digital signals, as opposed to a voice network, which transmits analog signals.

data packet \dā'tə pak'ət, dat'ə\ *n.* *See* packet.

data point \dā'tə point', dat'ə\ *n.* Any pair of numeric values plotted on a chart.

data processing \dā'tə pros'es-ēng, dat'ə\ *n.*
1. The general work performed by computers.
2. More specifically, the manipulation of data to transform it into some desired result. *Acronym:* DP (D-P'). *Also called* ADP, automatic data processing, EDP, electronic data processing. *See also* centralized processing, decentralized processing, distributed processing.

Data Processing Management Association \dā'tə pros'es-ēng man'əj-mənt ə-sō-sē-ā'shən, dat'ə\ *n.* *See* DPMA.

data protection \dā'tə pro-tek'shən, dat'ə\ *n.* The process of ensuring the preservation, integrity, and reliability of data. *See also* data integrity.

data rate \dā'tə rāt', dat'ə\ *n.* The speed at which a circuit or communications line can transfer information, usually measured in bits per second (bps).

data record \dā'tə rek'ərd, dat'ə\ *n.* *See* record¹.

data reduction \dā'tə rə-duk'shən, dat'ə\ *n.* The process of converting raw data to a more useful form by scaling, smoothing, ordering, or other editing procedures.

data segment \dā'tə seg'mənt, dat'ə\ *n.* The portion of memory or auxiliary storage that contains the data used by a program.

digital linear tape \dij`i-təl lin`ē-ər tāp` n. A magnetic storage medium used to back up data. Digital linear tape allows for faster transfer of data compared with other tape technologies. *Acronym:* DLT (D`L-T`).

Digital Micromirror Display \dij`i-təl mī`krō-mēr-ər dis-plā` n. The circuit technology behind Texas Instruments' Digital Projection System. An array of individually addressable mirrors on a chip, each less than 0.002 mm wide, rotate to reflect light into the lens of the projection system, creating a bright, full-color display. Displays can be combined to create high-definition systems of 1,920 × 1,035 (1,987,200) pixels with 64 million colors. *Acronym:* DMD (D`M-D`).

digital photography \dij`i-təl fə-to`grə-fē` n. Photography by means of a digital camera. Digital photography differs from conventional photography in that a digital camera does not use a silver halide-based film to capture an image. Instead, a digital camera captures and stores each image electronically. *See also* digital camera.

digital proof \dij`i-təl prōf` n. *See* direct digital color proof.

digital recording \dij`i-təl rə-kōr`dēng` n. The storage of information in binary-encoded (digital) format. Digital recording converts information—text, graphics, sound, or pictures—to strings of 1s and 0s that can be physically represented on a storage medium. Digital recording media include computer disks and tapes, optical (or compact) discs, and ROM cartridges of the type used for some software and many computer games.

digital signal \dij`i-təl sig`nəl` n. A signal, such as one transmitted within or between computers, in which information is represented by discrete states—for example, high and low voltages—rather than by fluctuating levels in a continuous stream, as in an analog signal.

digital signal processor \dij`i-təl sig`nəl pros`es-ər` n. An integrated circuit designed for high-speed data manipulation and used in audio, communications, image manipulation, and other data acquisition and data control applications. *Acronym:* DSP (D`S-P`).

digital signature \dij`i-təl sig`nə-chur` n. A personal authentication method based on encryption

and secret authorization codes used for “signing” electronic documents.

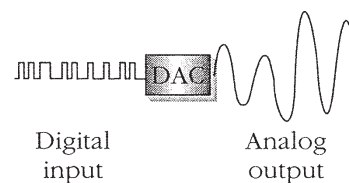
Digital Simultaneous Voice and Data \dij`i-təl sī`mul-tā`nē-əs vois and dā`tə, dat`ə` n. A modem technology, patented by Multi-Tech Systems, Inc., that allows a single telephone line to be used for conversation together with data transfer. This is accomplished by switching to packet-mode communications when the need for voice transfer is detected; digitized voice packets are then transferred along with data and command packets. *Acronym:* DSVD (D`S-V-D`).

digital sort \dij`i-təl sōrt` n. A type of ordering process in which record numbers or their key values are sorted digit by digit, beginning with the least significant (rightmost) digit. *Also called* radix sort.

digital speech \dij`i-təl spēch` n. *See* speech synthesis.

digital subscriber line \dij`i-təl sub-skrī`bər līn` n. An ISDN BRI (Basic Rate Interface) line or channel. *Acronym:* DSL (D`S-L`). *See also* BRI, ISDN.

digital-to-analog converter \dij`i-təl-tō`-an`ə-log kən-vər`-tər` n. A device that translates digital data to an analog signal. A digital-to-analog converter takes a succession of discrete digital values as input and creates an analog signal whose amplitude corresponds, moment by moment, to each digital value. *See the illustration.* *Acronym:* DAC (D`A-C`). *Compare* analog-to-digital converter.



Digital-to-analog converter.

digital versatile disc \dij`i-təl vər`sə-təl disk` n. *See* digital video disc.

digital video disc \dij`i-təl vid`ē-ō disk` n. The next generation of optical disc storage technology. With digital video disc technology, video, audio, and computer data can be encoded onto a compact disc (CD). A digital video disc can store greater amounts of data than a traditional CD. A standard single-layer, single-sided digital video

or a palette of shapes or patterns in a drawing program.

display board \di-splā' bōrd\ *n.* See video adapter.

display card \di-splā' kārd\ *n.* See video adapter.

display cycle \di-splā' sī kl\ *n.* The complete set of events that must occur in order for a computer image to be displayed on the screen, including both the software creation of an image in a computer's video memory and the hardware operations required for accurate on-screen display. See also refresh cycle.

Display Data Channel \dis-plā' dā'tə chan'əl, dat'ə\ *n.* See DDC.

display device \di-splā' də-vīs\ *n.* See display.

display element \di-splā' el'ə-mənt\ *n.* See graphics primitive.

display entity \di-splā' en'tə-tē\ *n.* See entity, graphics primitive.

display face \di-splā' fās\ *n.* A typeface suitable for headings and titles in documents, distinguished by its ability to stand out from other text on the page. Sans serif faces such as Helvetica and Avant Garde often work well as display faces. See also sans serif. Compare body face.

display frame \di-splā' frām\ *n.* One image in an animation sequence. See also frame (definition 3).

display image \di-splā' im'əj\ *n.* The collection of elements displayed together at a single time on a computer screen.

display page \di-splā' pāj\ *n.* One screenful of display information stored in a computer's video memory. Computers can have enough video memory to hold more than one display page at a time. In such instances, programmers, especially those concerned with creating animation sequences, can update the screen rapidly by creating or modifying one display page while another is being viewed by the user. See also animation.

display port \dis-plā' pōrt\ *n.* An output port on a computer that provides a signal for a display device such as a video monitor.

Display PostScript \di-splā' pōst'skript\ *n.* An extended version of the PostScript language, intended for device-independent imaging (including monitors and printers) in a multitasking environment. Display PostScript has been adopted by some hardware manufacturers as the standard

imaging approach for both screens and printers. See also PostScript.

Display Power Management Signaling \dis-plā' pou-ər man'əj-mənt sig'nə-lēng\ *n.* See DPMS.

display screen \di-splā' skrēn\ *n.* The part of a video unit on which images are shown. See also CRT.

display terminal \di-splā' tər'mə-nəl\ *n.* See terminal (definition 1).

Distance Vector Multicast Routing Protocol \di'stəns vek'tər mul'tē-kast rou'tēng prō'tə-kol, mul'tī-kast, rōō'tēng\ *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 (D'V-M-R-P').

distortion \di-stōr'shən\ *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 \di-stri'byōōt\ *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 \dis-tri'byōō-təd bul'ə-tin bōrd\ *n.* A collection of newsgroups distributed to all computers in a wide area network. See also newsgroup, Usenet.

Distributed COM \dis-tri'byōō-təd kom\ *n.* See DCOM.

Distributed Component Object Model \dis-tri'byōō-təd kəm-pō'nənt ob'jekt mod'əl\ *n.* See DCOM.

distributed computing \dis-tri'byōō-təd kəm-pyōō'tēng\ *n.* See distributed processing.

Distributed Computing Environment \dis-tri'byōō-təd kəm-pyōō'tēng en-vī'rən-mənt, en-vī'ərən-mənt\ *n.* A set of standards from the Open Group (formerly the Open Software Foundation) for development of distributed applications that

or a palette of shapes or patterns in a drawing program.

display board \di-splā' bōrd\ *n.* See video adapter.

display card \di-splā' kārd\ *n.* See video adapter.

display cycle \di-splā' sī kl\ *n.* The complete set of events that must occur in order for a computer image to be displayed on the screen, including both the software creation of an image in a computer's video memory and the hardware operations required for accurate on-screen display. See also refresh cycle.

Display Data Channel \dis-plā' dā'tə chan'əl, dat'ə\ *n.* See DDC.

display device \di-splā' də-vīs\ *n.* See display.

display element \di-splā' el'ə-mənt\ *n.* See graphics primitive.

display entity \di-splā' en'tə-tē\ *n.* See entity, graphics primitive.

display face \di-splā' fās\ *n.* A typeface suitable for headings and titles in documents, distinguished by its ability to stand out from other text on the page. Sans serif faces such as Helvetica and Avant Garde often work well as display faces. See also sans serif. Compare body face.

display frame \di-splā' frām\ *n.* One image in an animation sequence. See also frame (definition 3).

display image \di-splā' im'əj\ *n.* The collection of elements displayed together at a single time on a computer screen.

display page \di-splā' pāj\ *n.* One screenful of display information stored in a computer's video memory. Computers can have enough video memory to hold more than one display page at a time. In such instances, programmers, especially those concerned with creating animation sequences, can update the screen rapidly by creating or modifying one display page while another is being viewed by the user. See also animation.

display port \dis-plā' pōrt\ *n.* An output port on a computer that provides a signal for a display device such as a video monitor.

Display PostScript \di-splā' pōst'skript\ *n.* An extended version of the PostScript language, intended for device-independent imaging (including monitors and printers) in a multitasking environment. Display PostScript has been adopted by some hardware manufacturers as the standard

imaging approach for both screens and printers. See also PostScript.

Display Power Management Signaling \dis-plā' pou-ər man'əj-mənt sig'nə-lēng\ *n.* See DPMS.

display screen \di-splā' skrēn\ *n.* The part of a video unit on which images are shown. See also CRT.

display terminal \di-splā' tər'mə-nəl\ *n.* See terminal (definition 1).

Distance Vector Multicast Routing Protocol \di'stəns vek'tər mul'tē-kast rou'tēng prō'tə-kol, mul'tī-kast, rōō'tēng\ *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 (D'V-M-R-P').

distortion \di-stōr'shən\ *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 \di-stri'byōōt\ *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 \dis-tri'byōō-təd bul'ə-tin bōrd\ *n.* A collection of newsgroups distributed to all computers in a wide area network. See also newsgroup, Usenet.

Distributed COM \dis-tri'byōō-təd kom\ *n.* See DCOM.

Distributed Component Object Model \dis-tri'byōō-təd kəm-pō'nənt ob'jekt mod'əl\ *n.* See DCOM.

distributed computing \dis-tri'byōō-təd kəm-pyōō'tēng\ *n.* See distributed processing.

Distributed Computing Environment \dis-tri'byōō-təd kəm-pyōō'tēng en-vī'rən-mənt, en-vī'ərən-mənt\ *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 (D`C-E`). *See also* distributed processing.

distributed database \dis-tri`byōō-təd da`tə-bās\ *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 \dis-tri`byōō-təd da`tə-bās man`əj-mənt si`s-təm\ *n.* A database management system capable of managing a distributed database. *Acronym:* DDBMS (D`D-B`M-S`). *See also* distributed database.

distributed file system \dis-tri`byōō-təd fīl si`s-təm\ *n.* A file management system in which files may be located on multiple computers connected over a local or wide area network.

distributed intelligence \dis-tri`byōō-təd in-tel`ə-jəns\ *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 \dis-tri`byōō-təd net`wərk\ *n.* A network in which processing, storage, and other functions are handled by separate units (nodes) rather than by a single main computer.

distributed processing \dis-tri`byōō-təd pros`es-ēng\ *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 System Object Model \dis-tri`byōō-təd si`s-təm ob`jekt mod`əl\ *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 (D`S-O-M`). *See also* SOM (definition 1).

distributed transaction processing \dis-tri`byōō-təd tranz-ak`shən pros`es-ēng\ *n.* Transaction processing that is shared by one or more computers communicating over a network. *Acronym:* DTP (D`T-P`). *See also* distributed processing, transaction processing.

distribution list \dis-trə-byōō`shən 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.

distributive sort \di-stri`byə-tiv sōrt\ *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 \didh`ər-ēng\ *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.

divergence \di-vər`jəns\ *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

can operate on more than one platform. *Acronym:* DCE (D`C-E`). *See also* distributed processing.

distributed database \dis-tri`byōō-təd da`tə-bās\ *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 \dis-tri`byōō-təd da`tə-bās man`əj-mənt si`sstəm\ *n.* A database management system capable of managing a distributed database. *Acronym:* DDBMS (D`D-B`M-S`). *See also* distributed database.

distributed file system \dis-tri`byōō-təd fīl si`sstəm\ *n.* A file management system in which files may be located on multiple computers connected over a local or wide area network.

distributed intelligence \dis-tri`byōō-təd in-tel`ə-jəns\ *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 \dis-tri`byōō-təd net`wərk\ *n.* A network in which processing, storage, and other functions are handled by separate units (nodes) rather than by a single main computer.

distributed processing \dis-tri`byōō-təd pros`es-ēng\ *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 System Object Model \dis-tri`byōō-təd si`sstəm ob`jekt mod`əl\ *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 (D`S-O-M`). *See also* SOM (definition 1).

distributed transaction processing \dis-tri`byōō-təd tranz-ak`shən pros`es-ēng\ *n.* Transaction processing that is shared by one or more computers communicating over a network. *Acronym:* DTP (D`T-P`). *See also* distributed processing, transaction processing.

distribution list \dis-trə-byōō`shən 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.

distributive sort \di-stri`byə-tiv sōrt\ *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 \didh`ər-ēng\ *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.

divergence \di-vər`jəns\ *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

PCs that allows for increasing memory beyond the Intel 80x86 microprocessor real-mode limit of 1 megabyte. In earlier versions of microprocessors, EMS bypassed this memory board limit with a number of 16-kilobyte banks of RAM that could be accessed by software. In later versions of Intel microprocessors, including the 80386 and 80486 models, EMS is converted from extended memory by software memory managers, such as EMM386 in MS-DOS 5. Now EMS is used mainly for older MS-DOS applications because Windows and other applications running in protected mode on 80386 and higher microprocessors are free of the 1-MB limit. *Also called* LIM EMS. *See also* expanded memory, protected mode. *Compare* conventional memory, extended memory.

em space \em' spās\ *n.* A typographical unit of measure that is equal in width to the point size of a particular font. For many fonts, this is equal to the width of a capital M, from which the em space takes its name. *Compare* en space, fixed space, thin space.

emulate \e'myō-lāt\ *vb.* For a hardware or software system to behave in the same manner as another hardware or software system. In a network, for example, microcomputers often emulate mainframes or terminals so that two machines can communicate.

emulation \e'myā-lā'shən\ *n.* The process of a computer, device, or program imitating the function of another computer, device, or program.

emulator \e'myā-lā'tər\ *n.* Hardware or software designed to make one type of computer or component act as if it were another. By means of an emulator, a computer can run software written for another machine. In a network, microcomputers might emulate mainframes or terminals so that two machines can communicate.

emulsion laser storage \ē-mul'shən lā'zər stōr-əj\ *n.* A method for recording data in film by selective heating with a laser beam.

enable \e-nā'bl\ *vb.* To activate or turn on. *Compare* disable.

encapsulate \en-kap'sə-lāt\ *vb.* To treat a collection of structured information as a whole without affecting or taking notice of its internal structure. In communications, a message or packet constructed according to one protocol, such as a TCP/

IP packet, may be taken with its formatting data as an undifferentiated stream of bits that is then broken up and packaged according to a lower-level protocol (for example, as ATM packets) to be sent over a particular network; at the destination, the lower-level packets are assembled, re-creating the message as formatted for the encapsulated protocol. In object-oriented programming, the implementation details of a class are encapsulated in a separate file whose contents do not need to be known by a programmer using that class. *See also* ATM (definition 1), object-oriented programming, TCP/IP.

Encapsulated PostScript \en-kap'sə-lā-təd pōst'skript\ *n.* *See* EPS.

encapsulated type \en-kap'sə-lā-təd tīp\ *n.* *See* abstract data type.

encipher \en-sī'fər\ *vb.* *See* encryption.

encode \en-kōd\ *vb.* **1.** In data security, to encrypt. *See also* encryption. **2.** In programming, to put something into code, which frequently involves changing the form—for example, changing a decimal number to binary-coded form. *See also* binary-coded decimal, EBCDIC.

encryption \en-krip'shən\ *n.* The process of encoding data to prevent unauthorized access, especially during transmission. Encryption is usually based on a key that is essential for decoding. The U.S. National Bureau of Standards created a complex encryption standard, Data Encryption Standard (DES), which provides almost unlimited ways to encrypt documents. *See also* DES.

encryption key \en-krip'shən kē\ *n.* A sequence of data that is used to encrypt other data and that, consequently, must be used for the data's decryption. *See also* decryption, encryption.

end-around carry \end'ə-round kâr'ē\ *n.* A special type of end-around shift operation on a binary value that treats the carry bit as an extra bit; that is, the carry bit is moved from one end of the value to the other. *See also* carry, end-around shift, shift.

end-around shift \end'ə-round shift\ *n.* An operation performed on a binary value in which a bit is shifted out of one end and into the other end. For example, a right-end shift on the value 00101001 yields 10010100. *See also* shift.

en dash \en' dash\ *n.* A punctuation mark (–) used to show ranges of dates and numbers, as in

file fragmentation \fīl' frag-mən-tā'shən\ *n.* **1.**

The breaking apart of files into small, separate segments for storage 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 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 \fīl' gap\ *n.* See block gap.

file handle \fīl' han'dl\ *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 \fīl'hand-lēng rōō-tēn'\ *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 \fīl' hed'ər\ *n.* See header (definition 2).

file layout \fīl' lā'out\ *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 \fīl' lī-brār'ē-ən\ *n.* A person or process responsible for maintaining, archiving, copying, and providing access to a collection of data.

file maintenance \fīl' mān'tə-nəns\ *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 manager \fīl' man'ə-jər\ *n.* A module of an operating system or environment that controls the physical placement of and access to a group of program files.

filename \fīl'nām\ *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 handle by 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 \fīl'nām eks-ten'shən\ *n.* See extension (definition 1).

file protection \fīl' prə-tek'shən\ *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 \fīl' rə-kəv'ər-ē\ *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 \fīl' rə-trē'vəl\ *n.* The act of transferring a data file from a storage location to the machine where it is to be used.

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 low-pass 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 computer graphics, a special effect or production effect that is applied to bitmapped images; for example, shifting pixels within an image, making elements of the image transparent, or distorting the image. Some filters are built into a graphics program, such as a paint program or an image editor. Others are separate software packages that plug into the graphics program. *See also* bitmapped graphics, image editor, paint program.

filtering program \fil'tər-ēng prō'gram\ *n.* A program that filters information and presents only results that match the qualifications defined in the program.

FilterKeys \fil'tər-kēz\ *n.* A Windows 95 accessibility control panel feature that enables users with physical disabilities to use the keyboard. With FilterKeys, the system ignores brief and repeated keystrokes that result from slow or inaccurate finger movements. *See also* accessibility. *Compare* MouseKeys, ShowSounds, SoundSentry, StickyKeys, ToggleKeys.

Final-Form-Text DCA \fi'nəl-fōrm-tekst` D-C-A'\ *n.* A standard in Document Content Architecture (DCA) for storing documents in ready-to-print form for interchange between dissimilar programs. A related standard is Revisable-Form-Text DCA (RFTDCA). *Acronym:* FFTDCA (F`F-T`D-C-A`). *See also* DCA (definition 1). *Compare* Revisable-Form-Text DCA.

find \fīnd\ *vb.* *See* search².

Finder \fīn'dər\ *n.* The standard interface to the Macintosh operating system, allowing the user to view the contents of directories (folders); to move,

copy, and delete files; and to launch applications. Items in the system are often represented as icons, and a mouse or similar pointing device is used to manipulate these items. The Finder was the first commercially successful graphical user interface, and it helped launch a wave of interest in icon-based systems. *See also* MultiFinder.

finger¹ \fēng'ər\ *n.* An Internet utility, originally limited to UNIX but now available on many other platforms, that enables a user to obtain information on other users who may be at other sites (if those sites permit access by finger). Given an e-mail address, finger returns the user's full name, an indication of whether or not the user is currently logged on, and any other information the user has chosen to supply as a profile. Given a first or last name, finger returns the logon names of users whose first or last names match.

finger² \fēng'ər\ *vb.* To obtain information on a user by means of the finger program.

fingerprint reader \fēng'-ər-print rē'dər\ *n.* A scanner that reads human fingerprints for comparison to a database of stored fingerprint images.

FIPS \fips, F`I-P-S'\ *n.* *See* Federal Information Processing Standards.

firewall \fir'wāl\ *n.* A security system intended to protect an organization's network against external threats, such as hackers, coming from another network, such as the Internet. A firewall prevents computers in the organization's network from communicating directly with computers external to the network and vice versa. Instead, all communication is routed through a proxy server outside of the organization's network, and the proxy server decides whether it is safe to let a particular message or file pass through to the organization's network.

firmware \fərm'wâr\ *n.* Software routines stored in read-only memory (ROM). Unlike random access memory (RAM), read-only memory stays intact even in the absence of electrical power. Startup routines and low-level input/output instructions are stored in firmware. It falls between software and hardware in terms of ease of modification. *See also* RAM, ROM.

FIR port \F`I-R' pōrt\ *n.* Short for **fast infrared port**. A wireless I/O port, most common on a portable computer, that exchanges data with an

secure a computer system from unauthorized access, such as the lock on the front of the cabinet of some personal computers.

hardware monitor \hărd'wâr mon'ə-tər\ *n.* A separate board-level circuit used to oversee the performance of a hardware/software system. A hardware monitor can detect the cause of a fatal error such as a system crash, whereas a software monitor or debugger cannot. *Compare* debugger.

hardware profile \hărd'wâr prō'fīl\ *n.* A set of data that describes the configuration and characteristics of a given piece of computer equipment. Such data is typically used to configure computers for use with peripheral devices.

hardware tree \hărd'wâr trē'\ *n.* In Windows 95, a data structure containing information about the configuration and requirements of a system's hardware devices. Consisting of nodes that point to active devices, the hardware tree is dynamic and is reconstructed every time Windows 95 is started or refreshed. The hardware tree facilitates the Plug and Play capability of Windows 95.

hardwired \hărd'wīrd\ *adj.* **1.** Built into a system using hardware such as logic circuits, rather than accomplished through programming. **2.** Physically connected to a system or a network, as by means of a network connector board and cable.

Harvard architecture \hăr'vərd ār'kə-tek-chur\ *n.* A processor architecture that uses separate address buses for code and for data. This increases throughput by allowing the system to fetch instructions at the same time that it reads and writes data. This architecture also allows optimization of memory system design because instructions tend to be fetched sequentially, whereas data reads and writes are more random.

Harvard Mark I \hăr'vərd măr'k wən'\ *n.* *See* Mark I.

hash¹ \hash\ *n.* In many FTP client programs, a command that instructs the FTP client to display a pound sign (#) each time it sends or receives a block of data. *See also* FTP client.

hash² \hash\ *vb.* To be mapped to a numerical value by a transformation known as a hashing function. Hashing is used to convert an identifier or key, meaningful to a user, into a value for the location of the corresponding data in a structure, such as a table. For example, given the key

MOUSE and a hashing function that added up the ASCII values of the characters, divided the total by 127, and took the remainder, MOUSE would hash to 12, and the data identified by MOUSE would be found among the items in entry 12 in the table.

hash coding \hash' kō'dēng\ *n.* *See* hash².

hash search \hash' sərch\ *n.* A search algorithm that uses hashing to find an element of a list. Hash searches are highly efficient because the hashing enables direct or almost direct access to the target element. *See also* binary search, hash², linear search, search algorithm.

hash total \hash' tō'təl\ *n.* An error-checking value derived from the addition of a set of numbers taken from data (not necessarily numeric data) that is to be processed or manipulated in some way. After processing, the hash total is recalculated and compared with the original total. If the two do not match, the original data has been changed in some way.

Hayes-compatible \hāz'kəm-pat'ə-bl\ *adj.* Responding to the same set of commands as the modems manufactured by Hayes Microcomputer Products. This command set has become the de facto standard for microcomputer modems.

HDBMS \H'D-B'M-S'\ *n.* *See* hierarchical database management system.

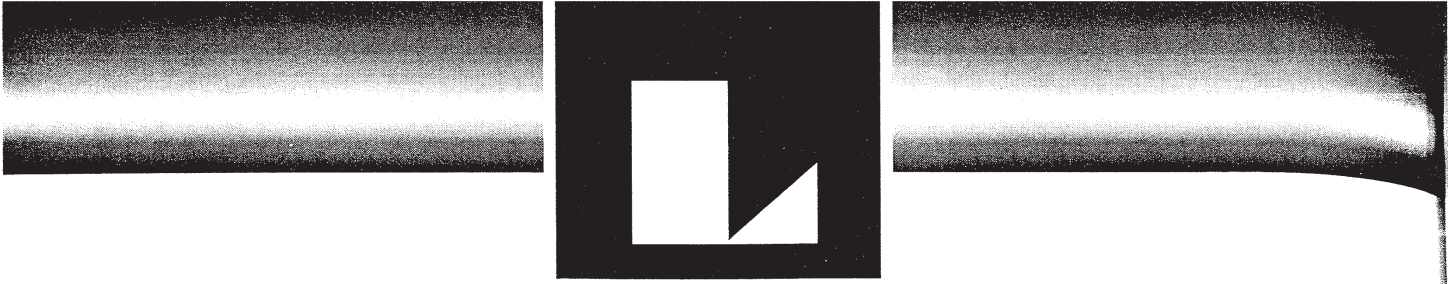
HDF \H'D-F'\ *n.* *See* Hierarchical Data Format.

HDLC \H'D-L-C'\ *n.* Acronym for **H**igh-level **D**ata **L**ink **C**ontrol. A protocol for information transfer adopted by the ISO. HDLC is a bit-oriented, synchronous protocol that applies to the data-link (message-packaging) layer (layer 2 of the ISO/OSI model) for computer-microcomputer communications. Messages are transmitted in units called frames, which can contain differing amounts of data but which must be organized in a particular way. *See also* frame (definition 1), ISO/OSI model.

HDSL \H'D-S-L'\ *n.* *See* High-data-rate Digital Subscriber Line.

HDTV \H'D-T-V'\ *n.* Acronym for **h**igh-**d**efinition **t**elevision. A method of transmitting and receiving television signals that produces a picture with much greater resolution and clarity than does standard television technology.

head \hed\ *n.* The read/write mechanism in a disk or tape drive. It converts changes in the magnetic field of the material on the disk or tape surface to



L1 cache \L-wən˘ kash˘\ *n.* A memory cache built into i486 and higher-level processors. The L1 cache, typically containing 8 KB, can be read in a single clock cycle, so it is tried first. The i486 contains one L1 cache; the Pentium contains two, one for code and one for data. *Also called* level 1 cache, on-chip cache. *See also* cache, i486DX, Pentium. *Compare* L2 cache.

L2 cache \L-tōō˘ kash˘\ *n.* A memory cache consisting of static RAM on a motherboard that uses an i486 or higher-level processor. The L2 cache, which typically contains 128 KB to 1 MB, is faster than the system DRAM but slower than the L1 cache built into the CPU chip. *Also called* level 2 cache. *See also* cache, dynamic RAM, i486DX, static RAM. *Compare* L1 cache.

L8R \lā˘tər\ *adv.* Abbreviation for “later.” As in “See you later,” an expression often used in e-mail or Usenet groups as a closing remark.

.la \dot˘L-A˘\ *n.* On the Internet, the major geographic domain specifying that an address is located in Laos.

label \lā˘bəl\ *n.* An identifier. A label can be a physical item, such as a stick-on tag used to identify disks and other computer equipment, or an electronic label added to floppy disks or hard disks. It can also be a word, symbol, or other group of characters used to identify a file, a storage medium, an element defined in a computer program, or a specific item in a document such as a spreadsheet or a chart. *See also* identifier.

label prefix \lā˘bəl prē˘fiks\ *n.* In a spreadsheet, a character at the beginning of a cell entry that identifies the entry to the program as a label.

lag \lag\ *n.* The time difference between two events. In electronics, a lag is a delay between a change in input and a change in output. On computer displays, a lag is a fading brightness left on the phosphor coating of the screen after an image changes. *See also* persistence.

LAN \lan\ *n.* Acronym for **local area network**. A group of computers and other devices dispersed over a relatively limited area and connected by a communications link that enables any device to interact with any other on the network. LANs commonly include microcomputers and shared resources such as laser printers and large hard disks. The devices on a LAN are known as nodes, and the nodes are connected by cables through which messages are transmitted. *See also* baseband network, broadband network, bus network, collision detection, communications protocol, contention, CSMA/CD, network, ring network, star network, token bus network, token passing, token ring network. *Compare* wide area network.

landscape mode \land˘skāp mōd˘\ *n.* A horizontal print orientation in which text or images are printed “sideways”—that is, the width of the image on the page is greater than the height. *See the illustration. Compare* portrait mode.

Lorem ipsum solebat somnus complexus est.
Africanus se ostendit es forma quae mihi
imagine elus quam ex isso erat notior. Quem ubi
agnovi, quidem cohorui. Quaesivi tamen
vivertne ipse et Paulus pater et ali quos nos
extintos.

Landscape mode.

landscape monitor \land˘skāp mon˘ə-tər\ *n.* A monitor that is wider than it is high. Landscape monitors are usually about 33 percent wider than they are high—roughly the same proportion as a



LLC \L'L-C\' *n.* See IEEE 802 standards.

load¹ \lōd\' *n.* **1.** The total computing burden a system carries at one time. **2.** In electronics, the amount of current drawn by a device. **3.** In communications, the amount of traffic on a line.

load² \lōd\' *vb.* To place information from storage into memory for processing, if it is data, or for execution, if it is program code.

load-and-go \lōd'ənd-gō\' *adj.* In reference to a routine, able to begin execution immediately, once loaded. The term is commonly used in reference to compilers and the machine code they generate.

loaded line \lō'dəd līn\' *n.* A transmission cable fitted with loading coils, usually spaced about a mile apart, that reduce amplitude distortion in a signal by adding inductance (resistance to changes in current flow) to the line. Loaded lines minimize distortion within the range of frequencies affected by the loading coils, but the coils also reduce the bandwidth available for transmission.

loader \lō'dər\' *n.* A utility that loads the executable code of a program into memory for execution. On most microcomputers, the loader is an invisible part of the operating system and is automatically invoked when a program is run. See also load module, loader routine.

loader routine \lō'dər rōō-tēn\' *n.* A routine that loads executable code into memory and executes it. A loader routine can be part of an operating system or it can be part of the program itself. See also loader, overlay¹ (definition 1).

load module \lōd' moj'ōōl, mo'dyōōl\' *n.* An executable unit of code loaded into memory by the loader. A program consists of one or more load modules, each of which can be loaded and executed independently. See also loader.

load point \lōd' point\' *n.* The beginning of the valid data area on a magnetic tape.

load sharing \lōd' shār'ēng\' *n.* A method of managing one or more tasks, jobs, or processes by scheduling and simultaneously executing portions of them on two or more microprocessors.

local \lō'kəl\' *adj.* Close at hand or restricted to a particular area. More specifically, in communications, a local device is one that can be accessed directly rather than by means of a communications

line. In information processing, a local operation is one performed by the computer at hand rather than by a remote computer. In programming, a local variable is a variable that is restricted in scope, that is, used in only one part (subprogram, procedure, or function) of a program. Compare remote.

local area network \lō'kəl ār'ē-ə net'wərk\' *n.* See LAN.

local bus \lō'kəl bus\' *n.* A PC architecture designed to speed up system performance by allowing some expansion boards to communicate directly with the microprocessor, bypassing the normal system bus entirely. See also PCI local bus, VL bus.

local bypass \lō'kəl bī'pas\' *n.* A telephone connection used by some businesses that links separate buildings but bypasses the telephone company.

local group \lō'kəl grōōp\' *n.* **1.** In Windows NT, a group that is granted permissions and rights to only those resources on the workstation on which the group resides. Local groups provide a convenient means of allowing users both inside and outside the workstation to use resources found only on the workstation containing the local group. See also group¹. **2.** In Windows NT Advanced Server, a group that is granted permissions and rights to only the resources on the servers of its own domain. Local groups in this context provide a convenient means of allowing users from both inside and outside the domain to use resources found only on the servers of the domain. See also global group, group¹.

localhost \lō'kəl-hōst\' *n.* The name that is used to represent the same computer on which a TCP/IP message originates. An IP packet sent to localhost has the IP address 127.0.0.1 and does not actually go out to the Internet. See also IP address, packet (definition 1), TCP/IP.

localization \lō'kə-lə-zā'shən\' *n.* The process of altering a program so that it is appropriate for the area in which it is used. For example, the developers of a word processing program must localize the sorting tables in the program for different countries or languages because the correct order of characters in one language might be incorrect in another.



local loop \lō`kəl lōōp` \ *n.* A telephone connection that runs from the subscriber to the local telephone exchange.

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

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

local reboot \lō`kəl rē`bōōt\ *n.* A reboot of the machine that one is directly working on, rather than a remote host. *See also* reboot.

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

local variable \lō`kəl vār`ē-ə-bl\ *n.* A program variable whose scope is limited to a given block of code, usually a subroutine. *See also* scope (definition 1). *Compare* global variable.

location \lō-kā`shən` \ *n.* *See* address¹ (definition 1).

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

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

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

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

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

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

log \log\ *n.* **1.** A record of transactions or activities that take place on a computer system. **2.** *See* logarithm.

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

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

logical \loj`ə-kəl\ *adj.* **1.** Based on true and false alternatives as opposed to arithmetic calculation of numeric values. For example, a logical expression is one that, when evaluated, has a single outcome, either true or false. *See also* Boolean algebra. *Compare* fuzzy logic. **2.** Of or pertaining to a conceptual piece of equipment or frame of reference, regardless of how it may be realized physically. *Compare* physical.

logical decision \loj`ə-kəl də-sizh`ən\ *n.* Any decision that can have one of two outcomes (true/false, yes/no, and so on). *Compare* fuzzy logic.

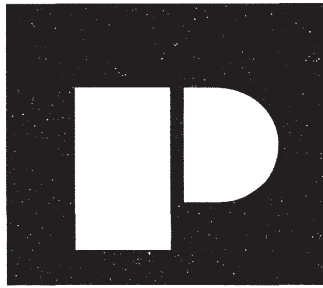
logical device \loj`ə-kəl də-vīs` \ *n.* A device named by the logic of a software system, regardless of its physical relationship to the system. For example, a single floppy disk drive can simultaneously be, to the MS-DOS operating system, both logical drive A and drive B.

logical drive \loj`ə-kəl drīv` \ *n.* *See* logical device.

logical error \loj`ə-kəl âr`ər\ *n.* *See* logic error.

logical expression \loj`ə-kəl eks-presh`ən\ *n.* *See* Boolean expression.

logical file \loj`ə-kəl fīl` \ *n.* A file as seen from a conceptual standpoint, without reference to and as



P \pet`ə\ *prefix* See peta-.

P5 \P-fiv` \ *n.* Intel Corporation's internal working name for the Pentium microprocessor. Although it was not intended to be used publicly, the name P5 leaked out to the computer-industry trade press and was commonly used to reference the microprocessor before it was released. *See also* 586, Pentium.

.pa \dot`P-A` \ *n.* On the Internet, the major geographic domain specifying that an address is located in Panama.

pack \pak\ *vb.* To store information in a more compact form. Packing eliminates unnecessary spaces and other such characters and may use other special methods of compressing data as well. It is used by some programs to minimize storage requirements.

package \pak`ej\ *n.* **1.** A computer application consisting of one or more programs created to perform a particular type of work—for example, an accounting package or a spreadsheet package. **2.** In electronics, the housing in which an electronic component is packaged. *See also* DIP.

packaged software \pak`əjd soft`wâr\ *n.* A software program sold through a retail distributor, as opposed to custom software. *Compare* canned software.

packed decimal \pakd`des`ə-məl\ *adj.* A method of encoding decimal numbers in binary form that maximizes storage space by using each byte to represent two decimal digits. When signed decimal numbers are stored in packed decimal format, the sign appears in the rightmost four bits of the rightmost (least significant) byte.

packet \pak`ət\ *n.* **1.** A unit of information transmitted as a whole from one device to another on a network. **2.** In packet-switching networks, a transmission unit of fixed maximum size that consists of binary digits representing both data and a header containing an identification number,

source and destination addresses, and sometimes error-control data. *See also* packet switching.

packet assembler/disassembler \pak`ət ə-sem`-blər-dis`ə-sem-blər\ *n.* An interface between non-packet-switching equipment and a packet-switching network. *Acronym:* PAD (P`A-D`).

packet filtering \pak`ət fil`tər-ēng\ *n.* The process of controlling network access based on IP addresses. Firewalls will often incorporate filters that allow or deny users the ability to enter or leave a local area network. Packet filtering is also used to accept or reject packets such as e-mail, based on the origin of the packet to ensure security on a private network. *See also* firewall, IP address, packet (definition 1).

Packet Internet Groper \pak`ət in`tər-net grō`-pər\ *n.* *See* ping¹ (definition 1).

packet switching \pak`ət swich`ēng\ *n.* A message-delivery technique in which small units of information (packets) are relayed through stations in a computer network along the best route available between the source and the destination. A packet-switching network handles information in small units, breaking long messages into multiple packets before routing. Although each packet may travel along a different path, and the packets composing a message may arrive at different times or out of sequence, the receiving computer reassembles the original message correctly. Packet-switching networks are considered to be fast and efficient. To manage the tasks of routing traffic and assembling/disassembling packets, such a network requires some "intelligence" from the computers and software that control delivery. The Internet is an example of a packet-switching network. Standards for packet switching on networks are documented in the CCITT recommendation X.25.

packing density \pak`ēng den`sə-tē\ *n.* The number of storage units per length or area of a



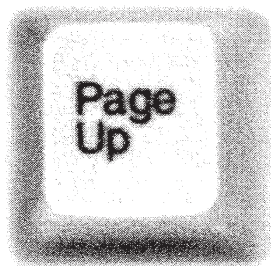
page printer \pāj' prin'tər\ *n.* Any printer, such as a laser printer, that prints an entire page at once. Because page printers must store the entire page in memory before printing, they require relatively large amounts of memory. *Compare* line printer.

page reader \pāj' rē'dər\ *n.* See document reader.

page setup \pāj' set'up\ *n.* A set of choices that affect how a file is printed on the page. Page setup might reflect the size of paper going into the printer, the page margins, the specific pages in the document to be printed, whether the image is to be reduced or enlarged when printed, and whether another file is to be printed immediately after the first file is printed.

pages per minute \pāj'jəz pər min'ət\ *n.* Abbreviated PPM or ppm. A rating of a printer's output capacity, that is, the number of printed pages the printer can produce in one minute. A printer's PPM rating is usually provided by the manufacturer and is based on a "normal" page. Pages with excessive graphics or fonts may reduce a printer's PPM rate dramatically.

Page Up key \pāj up' kē\ *n.* A standard key (often labeled "PgUp") on most computer keyboards whose specific meaning is different in different programs. In many cases, it moves the cursor up to the top of the previous page or a specific number of lines. See the illustration.



Page Up key.

pagination \pāj'ə-nā'shun\ *n.* **1.** The process of dividing a document into pages for printing. **2.** The process of adding page numbers, as in a running head.

paging \pāj'jēŋ\ *n.* A technique for implementing virtual memory. The virtual address space is divided into a number of fixed-size blocks called pages, each of which can be mapped onto any of

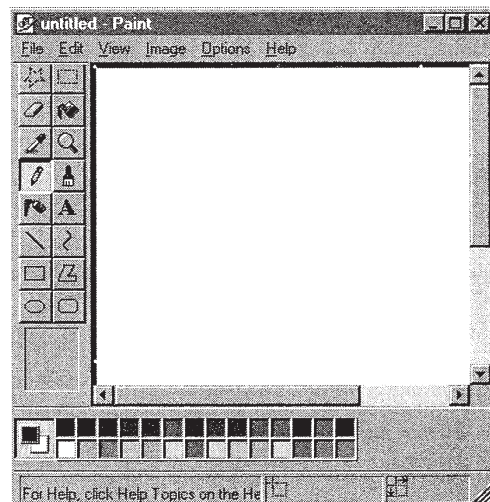
the physical addresses available on the system. Special memory management hardware (MMU or PMMU) performs the address translation from virtual addresses to physical addresses. See also memory management unit, paged memory management unit, virtual memory.

paint¹ \pānt\ *n.* A color and pattern used with graphics programs to fill areas of a drawing, applied with tools such as a paintbrush or a spraycan.

paint² \pānt\ *vb.* To fill a portion of a drawing with paint.

paintbrush \pānt'brush\ *n.* An artist's tool in a paint program or another graphics application for applying a streak of solid color to an image. The user can usually select the width of the streak. See also paint program. *Compare* spraycan.

paint program \pānt' prō'gram\ *n.* An application program that creates graphics as bit maps. A paint program, because it treats a drawing as a group of dots, is particularly appropriate for free-hand drawing. Such a program commonly provides tools for images requiring lines, curves, and geometric shapes but does not treat any shape as an entity that can be moved or modified as a discrete object without losing its identity. See the illustration. *Compare* drawing program.



Paint program.

palette \pal'ət\ *n.* **1.** In paint programs, a collection of drawing tools, such as patterns, colors, brush shapes, and different line widths, from

eventually (in five years or more). *See also* non-volatile memory.

permanent swap file \pər`mə-nənt swāp`fīl\ *n.* In Windows, a file composed of contiguous disk sectors used for virtual memory operations. *See also* swap file, virtual memory.

permanent virtual circuit \pər`mə-nənt vər`chōō-əl sər`kət\ *n.* *See* PVC.

permission \pər-mish`ən\ *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; these permissions are stored in the system (often in a file called a *permissions log*) and are checked when a user attempts to access a resource.

perpendicular recording \pər-pən-dik`yə-lər rə-kōr`dēng\ *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 \pər-si`stəns\ *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 \pər-si`stənt dā`tə, dat`ə\ *n.* Data that is stored in a database or on tape so that it is retained by the computer between sessions.

persistent link \pər-si`stənt lēnk`\ *n.* *See* hot link (definition 1).

persistent storage \pər-si`stənt stōr`əj\ *n.* Memory that remains intact when the power to a device is turned off, such as ROM. *See also* memory.

personal computer \pər`sə-nəl kəm-pyōō`tər\ *n.* A computer designed for use by one person at a time. Personal computers do not need to share the processing, disk, and printer resources of another computer. IBM PC-compatible computers and Apple Macintoshes are both examples of personal computers. *Acronym:* PC (P-C).

Personal Computer \pər`sə-nəl kəm-pyōō`tər\ *n.* *See* IBM PC.

Personal Computer Memory Card International Association \pər`sən-əl kəm-pyōō`tər

mem`ər-ē kărd in-tər-nash`ə-nəl ə-sō`sē-ā`shən\ *n.* *See* PCMCIA.

personal digital assistant \pər`sə-nəl dij`i-təl ə-si`stənt\ *n.* *See* PDA.

personal finance manager \pər`sə-nəl fī`nans man`ə-jər\ *n.* A software application designed to assist the user in performing simple financial accounting tasks, such as balancing checkbooks and paying bills.

personal information manager \pər`sə-nəl in-fər-mā`shən man`ə-jər\ *n.* *See* PIM.

perspective view \pər-spek`tiv vyōō`\ *n.* In computer graphics, a display method that shows objects in three dimensions (height, width, and depth), with the depth aspect rendered according to the desired perspective. An advantage of perspective view is that it presents a more accurate representation of what the human eye perceives. *Compare* isometric view.

peta- \pet`ə\ *prefix* Abbreviated P. Denotes 1 quadrillion (10^{15}). In computing, which is based on the binary (base-2) numbering system, *peta-* has a literal value of 1,125,899,906,842,624, which is the power of 2 (2^{50}) closest to 1 quadrillion.

petabyte \pet`ə-bīt`\ *n.* Abbreviated PB. Either 1 quadrillion bytes or 1,125,899,906,842,624 bytes.

.pg \dot`P-G`\ *n.* On the Internet, the major geographic domain specifying that an address is located in Papua New Guinea.

PGA \P`G-A`\ *n.* *See* pin grid array, Professional Graphics Adapter.

PgDn key \pāj-doun`kē`\ *n.* *See* Page Down key.

PGP \P`G-P`\ *n.* Acronym for **Pretty Good Privacy**. A program for public key encryption, using the RSA algorithm, developed by Philip Zimmermann. PGP software is available in unsupported free versions and supported commercial versions. *See also* privacy, public key encryption, RSA encryption.

PgUp key \pāj-up`kē`\ *n.* *See* Page Up key.

.ph \dot`P-H`\ *n.* On the Internet, the major geographic domain specifying that an address is located in the Philippines.

phase \fāz\ *n.* A relative measurement that describes the temporal relationship between two signals that have the same frequency. Phase is measured in degrees, with one full oscillation cycle having 360 degrees. The phase of one signal

presents the user with a tabbed, index-card-like selection of property pages, each of which features standard dialog-style controls for customizing parameters.

proportional font \prə-pōr'shən-əl font\ *n.* A set of characters in a particular style and size in which a variable amount of horizontal space is allotted to each letter or number. In a proportional font, the letter *i*, for example, is allowed less space than the letter *m*. *Compare* monospace font.

proportional spacing \prə-pōr'shən-əl spā'sēng\ *n.* A form of character spacing in which the horizontal space each character occupies is proportional to the width of the character. The letter *w*, for example, takes up more space than the letter *i*. *Compare* monospacing.

proprietary \prə-prī'ə-târ-ē\ *adj.* Of, pertaining to, or characteristic of something that is privately owned. Generally, the term refers to technology that has been developed by a particular corporation or entity, with specifications that are considered by the owner to be trade secrets. Proprietary technology may be legally used only by a person or entity purchasing an explicit license. Also, other companies are unable to duplicate the technology, both legally and because its specifications have not been divulged by the owner. *Compare* public domain.

proprietary software \prə-prī'ə-târ-ē soft'wâr\ *n.* A program owned or copyrighted by an individual or a business and available for use only through purchase or by permission of the owner. *Compare* public-domain software.

protected mode \prə-tek'təd mōd\ *n.* An operating mode of the Intel 80286 and higher microprocessors that supports larger address spaces and more advanced features than real mode. When started in protected mode, these CPUs provide hardware support for multitasking, data security, and virtual memory. The Windows NT and OS/2 operating systems run in protected mode, as do most versions of UNIX for these microprocessors. *Compare* real mode.

protocol \prō'tə-kol\ *n.* *See* communications protocol.

protocol layer \prō'tə-kol lā'ər, lâr\ *n.* *See* layer.

protocol stack \prō'tə-kol stak\ *n.* The set of protocols that work together on different levels to

enable communication on a network. For example, TCP/IP, the protocol stack on the Internet, incorporates more than 100 standards including FTP, IP, SMTP, TCP, and Telnet. *Also called* protocol suite. *See also* ISO/OSI model.

protocol suite \prō'tə-kol swēt\ *n.* *See* protocol stack.

prototyping \prō'tə-tī'pēng\ *n.* The creation of a working model of a new computer system or program for testing and refinement. Prototyping is used in the development of both new hardware and software systems and new systems of information management. Tools used in the former include both hardware and support software; tools used in the latter can include databases, screen mockups, and simulations that, in some cases, can be developed into a final product.

proxy \proks'ē\ *n.* *See* proxy server.

proxy server \proks'ē sər'vər\ *n.* A firewall component that manages Internet traffic to and from a local area network (LAN) and can provide other features, such as document caching and access control. A proxy server can improve performance by supplying frequently requested data, such as a popular Web page, and can filter and discard requests that the owner does not consider appropriate, such as requests for unauthorized access to proprietary files. *See also* firewall.

PrtSc key \print' skrēn kē\ *n.* *See* Print Screen key.

.ps \dot'P-S\ *n.* The file extension that identifies PostScript printer files. *See also* PostScript.

PS/2 bus \P'S-tōō' bus\ *n.* *See* Micro Channel Architecture.

psec \pī'kō-sek'ənd\ *n.* *See* picosecond.

pseudocode \sōō'dō-kōd\ *n.* **1.** Abbreviated p-code. A machine language for a nonexistent processor (a pseudomachine). Such code is executed by a software interpreter. The major advantage of p-code is that it is portable to all computers for which a p-code interpreter exists. The p-code approach has been tried several times in the microcomputer industry, with mixed success. The best known attempt was the UCSD p-System. *See also* pseudomachine, UCSD p-System. **2.** Any informal, transparent notation in which a program or algorithm description is written. Many programmers write their programs first in a pseudocode



that looks much like a mixture of English and their favorite programming language, such as C or Pascal, and then translate it line by line into the actual language being used.

pseudo compiler \sōō`dō kəm-pī`lər\ *n.* A compiler that generates a pseudolanguage. *See also* pseudolanguage.

pseudocomputer \sōō`dō kəm-pyōō`tər\ *n.* *See* pseudomachine.

pseudolanguage \sōō`dō-lang`wəj\ *n.* A nonexistent programming language—that is, one for which no implementation exists. The term can refer either to the machine language for a nonexistent processor or to a high-level language for which no compiler exists. *See also* pseudocode.

pseudomachine \sōō`dō-mə-shēn\ *n.* Abbreviated p-machine. A processor that doesn't actually exist in hardware but that is emulated in software. A program written for the pseudomachine can run on several platforms without having to be recompiled. *See also* pseudocode, UCSD p-System.

pseudo-operation \sōō`dō-op-ər-ā`shən\ *n.* Abbreviated pseudo-op. In programming, a program instruction that conveys information to an assembler or compiler but is not translated into a machine language instruction—for example, an instruction that establishes the value of a constant or the manner in which Boolean (logical) expressions are to be evaluated.

PSK \P`S-K\ *n.* *See* phase-shift keying.

PSN \P`S-N\ *n.* Acronym for **packet-switching network**. *See* packet switching.

p-system \P`si`stəm\ *n.* An operating system based on a pseudomachine implemented in software. A program written for the p-system is more portable than one written for a machine-dependent operating system. *See also* UCSD p-System.

.pt \dot`P-T\ *n.* On the Internet, the major geographic domain specifying that an address is located in Portugal.

P-type semiconductor \P`tīp sem`ē-kən-duk-tər, sem`ī-kən-duk-tər\ *n.* Semiconductor material in which electrical conduction is carried by holes (“vacancies” left by electrons). Whether a semiconductor is N-type or P-type depends on the kind of dopant added during manufacture. A dopant with a shortage of electrons results in a P-type semiconductor. *Compare* N-type semiconductor.

/pub \slash-pub\ *n.* Short for **public**. A directory in an anonymous FTP archive that is accessible by the public and that generally contains files available for free download. *See also* anonymous FTP.

pub \pub\ *n.* *See* /pub.

public directory \pu`blik dər-ek`tər-ē\ *n.* A directory on an FTP server that is accessible by anonymous users for the purpose of retrieving or storing files. Often the directory is called /pub. *See also* anonymous FTP, FTP (definition 1), FTP server, /pub.

public domain \pu`blik dō-mān\ *n.* The set of all creative works, such as books, music, or software, that are not covered by copyright or other property protection. Works in the public domain can be freely copied, modified, and otherwise used in any manner for any purpose. Much of the information, texts, and software on the Internet is in the public domain, but putting a copyrighted work on the Internet does not put it in the public domain. *Compare* proprietary.

public-domain software \pu`blik-dō-mān soft`wār\ *n.* A program donated for public use by its owner or developer and freely available for copying and distribution. *Compare* free software, freeware, proprietary software, shareware.

public files \pu`blik filz\ *n.* Files with no access restrictions.

public folders \pu`blik fōl`dərz\ *n.* The folders that are made accessible on a particular machine or by a particular user in a shared networking environment. *Compare* private folders.

public key \pu`blik kē\ *n.* One of two keys in public key encryption. The user releases this key to the public, who can use it for encrypting messages to be sent to the user and for decrypting the user's digital signature. *See also* public key encryption. *Compare* private key.

public key cryptography \pu`blik kē krip-to`grāfē\ *n.* *See* public key encryption.

public key encryption \pu`blik kē`en-krip`shən\ *n.* An asymmetric scheme that uses a pair of keys for encryption: the public key encrypts data, and a corresponding secret key decrypts it. For digital signatures, the process is reversed: the sender uses the secret key to create a unique electronic number that can be read by anyone possessing the corresponding public key, which verifies that the

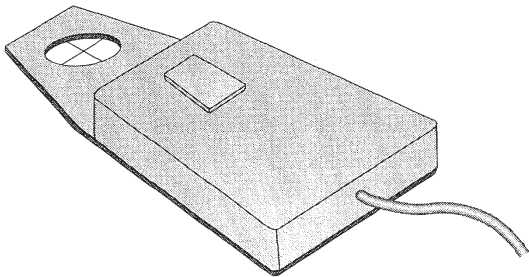


public rights

message is truly from the sender. *See also* private key, public key.

public rights \puˈblik rīts\ *n.* In the context of the Internet, the extent to which members of the public are permitted to use (and to place) information on the Internet under intellectual property law. *See also* fair use, public domain, public-domain software.

puck \puk\ *n.* A pointing device used with a graphics tablet. A puck, which is often used in engineering applications, is a mouselike device with buttons for selecting items or choosing commands and a clear plastic section extending from one end with cross hairs printed on it. The intersection of the cross hairs on the puck points to a location on the graphics tablet, which in turn is mapped to a specific location on the screen. Because the puck's cross hairs are on a transparent surface, a user can easily trace a drawing by placing it between the graphics tablet and the puck and moving the cross hairs over the lines of the drawing. *See the illustration. See also* graphics tablet, stylus.



Puck.

pull \pul\ *vb.* **1.** The process of retrieving data from a network server. *Compare* push (definition 2). **2.** *See* pop.

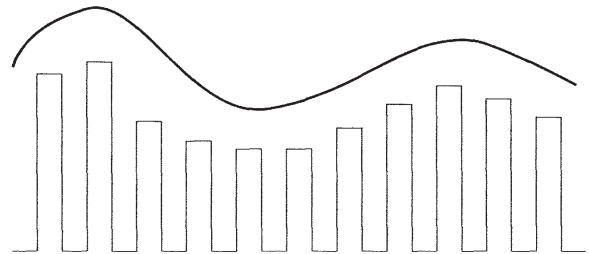
pull-down menu \pulˈdaʊn menˈyoo\ *n.* A menu that is pulled down from the menu bar and that remains available as long as the user holds it open. *Compare* drop-down menu.

pulse \puls\ *n.* A transient signal, usually brief and with a discrete onset and offset.

pulse amplitude modulation \pulsˈ amˈplə-tōd mo-dyə-lāˈshən, mojˈə-lāˈshən\ *n.* A method of encoding information in a signal by varying the amplitude of pulses. The unmodu-

pulse duration modulation

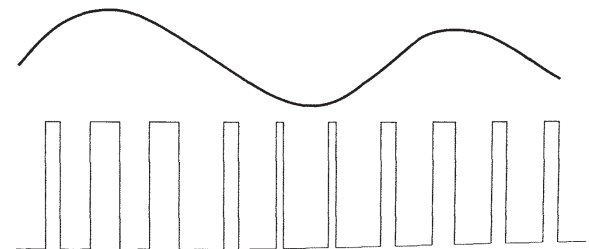
lated signal consists of a continuous train of pulses of constant frequency, duration, and amplitude. During modulation the pulse amplitudes are changed to reflect the information being encoded. *See the illustration. Acronym:* PAM (pam, PˈA-Mˈ). *Compare* pulse code modulation, pulse duration modulation, pulse position modulation.



Pulse amplitude modulation.

pulse code modulation \pulsˈ kōdˈ mo-dyə-lāˈshən, mojˈə-lāˈshən\ *n.* A method of encoding information in a signal by varying the amplitude of pulses. Unlike pulse amplitude modulation (PAM), in which pulse amplitude can vary continuously, pulse code modulation limits pulse amplitudes to several predefined values. Because the signal is discrete, or digital, rather than analog, pulse code modulation is more immune to noise than PAM. *Acronym:* PCM (PˈC-Mˈ). *Compare* pulse amplitude modulation, pulse duration modulation, pulse position modulation.

pulse duration modulation \pulsˈ dur-āˈshən mo-dyə-lāˈshən, mojˈə-lāˈshən\ *n.* A method of encoding information in a signal by varying the duration of pulses. The unmodulated signal consists of a continuous train of pulses of constant frequency, duration, and amplitude. During modulation, the pulse durations are changed to



Pulse duration modulation.

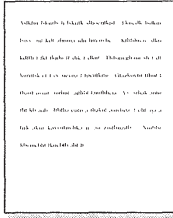


rag \rag\ *n.* Irregularity along the left or right edge of a set of lines of text on a printed page. Rag complements justification, in which one or both edges of the text form a straight vertical line. See the illustration. *See also* justify, ragged left, ragged right.

Ragged right



Justified



Ragged left



Rag.

ragged left \rag`əd 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 \rag`əd rīt\ *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, R`A-I-D\ *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 disk drives 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, R`A-I-D\ *n.* *See* RAID.

RAM \ram, R`A-M\ *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).

RAM cache \ram`kash, R`A-M\ *n.* 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 \ram`kărd, R`A-M\ *n.* An add-in circuit board containing RAM memory and the interface logic necessary to decode memory addresses.

RAM cartridge \ram`kăr`trij, R`A-M\ *n.* *See* memory cartridge.

RAM chip \ram`chip, R`A-M\ *n.* A semiconductor storage device. RAM chips can be either dynamic or static memory. *See also* dynamic RAM, RAM, static RAM.

RAM compression \ram`kəm-presh`ən, R-A-M\ *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 Windows 95 and Windows NT, which handle RAM more effectively, RAM compression is generally used only on older PCs. *See also* compression, RAM, Windows, Windows 95.

RAMDAC \ram`dak, R-A-M`D-A-C\ *n.* Acronym for **random access memory digital-to-analog converter**. A chip built into some VGA and SVGA video adapters that translates the digital representation of a pixel into the analog information needed by the monitor to display it. The presence of a RAMDAC chip generally enhances overall video performance. *See also* SVGA, VGA.

RAM disk \ram`disk, R`A-M\ *n.* Short for **random access memory disk**. A simulated disk drive

whose data is actually stored in RAM memory. A special program allows the operating system to read from and write to the simulated device as if it were a disk drive. RAM disks are extremely fast, but they require that system memory be given up for their use. Also, RAM disks usually use volatile memory, so the data stored on them disappears when power is turned off. Many portables offer RAM disks that use battery-backed CMOS RAM to avoid this problem. *See also* CMOS RAM. *Compare* disk cache.

RAM refresh \ram´ rē-fresh´, R`A-M´\ *n.* *See* refresh (definition 2).

RAM resident \ram´ rez`ə-dənt, R-A-M´\ *adj.* *See* memory-resident.

RAM-resident program \ram`rez-ə-dent prō´-gram, R`A-M´\ *n.* *See* terminate-and-stay-resident program.

random access \ran`dəm ak'ses\ *n.* The ability of a computer to find and go directly to a particular storage location without having to search sequentially from the beginning location. The human equivalent of random access would be the ability to find a desired address in an address book without having to proceed sequentially through all the addresses. A computer's semiconductor memory (both RAM and ROM) provides random access. Certain types of files stored on disk under some operating systems also allow random access. Such files are best used for data in which each record has no intrinsic relationship to what comes physically before or after it, as in a client list or an inventory. *Also called* direct access. *See also* RAM, ROM. *Compare* indexed sequential access method, sequential access.

random access memory \ran`dəm ak-ses mem´-ər-ē\ *n.* *See* RAM.

random noise \ran`dəm noiz´\ *n.* A signal in which there is no relationship between amplitude and time and in which many frequencies occur randomly, without pattern or predictability.

random number generation \ran`dəm num´bər jen-ər-ā`shən\ *n.* Production of an unpredictable sequence of numbers in which no number is any more likely to occur at a given time or place in the sequence than any other. Truly random number generation is generally viewed as impossible. The

process used in computers would be more properly called "pseudorandom number generation."

range \rānj\ *n.* **1.** A block of cells selected for similar treatment in a spreadsheet. A range of cells can extend across a row, down a column, or over a combination of the two, but all cells in the range must be contiguous, sharing at least one common border. Ranges allow the user to affect many cells with a single command—for example, to format them similarly, enter the same data into all of them, give them a name in common and treat them as a unit, or select and incorporate them into a formula. **2.** In more general usage, the spread between specified low and high values. Range checking is an important method of validating data entered into an application.

range check \rānj´ chek\ *n.* In programming, a limit check of both the upper and lower limits of a value, thus determining whether the value lies within an acceptable range. *See also* limit check.

RARP \R`A-R-P´\ *n.* Acronym for **R**everse **A**ddress **R**esolution **P**rotocol. A TCP/IP protocol for determining the IP address (or logical address) of a node on a local area network connected to the Internet, when only the hardware address (or physical address) is known. While RARP refers only to finding the IP address and ARP technically refers to the opposite procedure, ARP is commonly used for both senses. *See also* ARP.

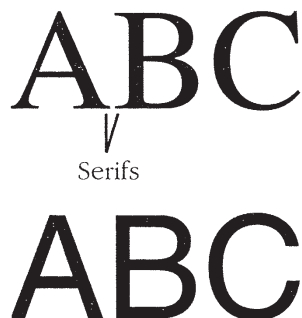
RAS \R`A-S´\ *n.* *See* remote access server, Remote Access Service.

raster \ra'stər\ *n.* A rectangular pattern of lines; on a video display, the horizontal scan lines from which the term *raster scan* is derived.

raster display \ra'stər dis-plā'\ *n.* A video monitor (typically a CRT) that displays an image on the screen as a series of horizontal scan lines from top to bottom. Each scan line consists of pixels that can be illuminated and colored individually. Television screens and most computer monitors are raster displays. *See also* CRT, pixel. *Compare* vector display.

raster graphics \ra'stər graf'iks\ *n.* A method of generating graphics that treats an image as a collection of small, independently controlled dots (pixels) arranged in rows and columns. *Compare* vector graphics.





Serif. A serif typeface (top) and a sans serif typeface (bottom).

serif² \sâr'îf\ *n.* Any of the short lines or ornaments at the ends of the strokes that form a typeface character.

server \sər'vər\ *n.* **1.** On a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network. **2.** On the Internet or other network, a computer or program that responds to commands from a client. For example, a file server may contain an archive of data or program files; when a client submits a request for a file, the server transfers a copy of the file to the client. *See also* client/server architecture. *Compare* client (definition 3).

server-based application \sər'vər-bāsd a-plā-kā'-shən\ *n.* A program that is shared over a network. The program is stored on the network server and can be used at more than one client machine at a time.

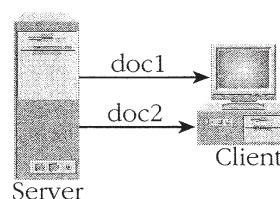
server cluster \sər'vər klu'stər\ *n.* A group of independent computers that work together as a single system. A server cluster presents the appearance of a single server to a client.

server error \sər'vər âr'ər\ *n.* A failure to complete a request for information through HTTP that results from an error at the server rather than an error by the client or the user. Server errors are indicated by HTTP status codes beginning with 5. *See also* HTTP, HTTP status codes.

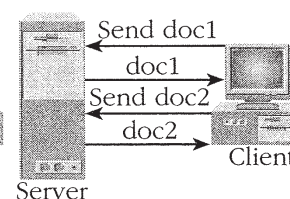
server push-pull \sər'vər pōōsh'pul', pōōl'\ *n.* A combination of Web client/server techniques individually called "server push" and "client pull." In server push, the server loads data to the client, but

the data connection stays open. This allows the server to continue sending data to the browser as necessary. In client pull, the server loads data to the client, but the data connection does not stay open. The server sends an HTML directive to the browser telling it to reopen the connection after a certain interval to get more data or possibly to open a new URL. *See the illustration. See also* HTML, server (definition 2), URL.

Server push



Client pull



Server push-pull.

server-side includes \sər'vər-sīd in-klōōdz'\ *n.* A mechanism for including dynamic text in World Wide Web documents. Server-side includes are special command codes that are recognized and interpreted by the server; their output is placed in the document body before the document is sent to the browser. Server-side includes can be used, for example, to include the date/time stamp in the text of the file. *See also* server (definition 2).

service \sər'vəs\ *n.* **1.** A customer-based or user-oriented function, such as technical support or network provision. **2.** In reference to programming and software, a program or routine that provides support to other programs, particularly at a low (close to the hardware) level. *See also* utility.

Service Advertising Protocol \sər'vəs ad'vər-tī-zēng prō'tə-kol\ *n.* A method used by a service-providing node in a network (such as a file server or application server) to notify other nodes on the network that it is available for access. When a server boots, it uses the protocol to advertise its service; when the same server goes offline, it uses the protocol to announce that it is no longer available. *Acronym:* SAP (S`A-P'). *See also* server (definition 1).

service bureau \sər'vis byər'ōl\ *n.* **1.** A company that provides various services related to publishing, such as prepress production, desktop pub-

.sgml \dot`S-G-M-L` n. The file extension that identifies files encoded in Standard Generalized Markup Language. *See also* SGML.

SGML \S`G-M-L` n. Acronym for **Standard Generalized Markup Language**. An information management standard adopted by the International Organization for Standardization (ISO) in 1986 as a means of providing platform- and application-independent documents that retain formatting, indexing, and linked information. SGML provides a grammarlike mechanism for users to define the structure of their documents and the tags they will use to denote the structure in individual documents. *See also* ISO.

.sh \dot`S-H` n. On the Internet, the major geographic domain specifying that an address is located in Saint Helena.

sh \S`H` n. *See* Bourne shell.

SHA \S`H-A` n. Acronym for **Secure Hash Algorithm**. A technique that computes a 160-bit condensed representation of a message or data file, called a *message digest*. The SHA is used by the sender and the receiver of a message in computing and verifying a digital signature, for security purposes. *See also* algorithm, digital signature.

shade¹ \shād` n. A particular color variation produced by mixing black with a pure color. *See also* brightness, IRGB.

shade² \shād` vb. To give added dimension to an image by including changes in appearance caused by light and shadow. *See also* color model.

shadow memory \shad`ō mem`ər-ē` n. A technique employed by the BIOS in some 80x86-based computers to copy the system's ROM BIOS routines into an unused section of RAM during the computer's startup process. This helps boost system performance by diverting system requests for the BIOS routines to their "shadow" copies. *Also called* shadow RAM, shadow ROM.

shadow print \shad`ō print` n. A style applied to text in which a duplicate of each character is shifted, typically down and to the right, to create a shadow effect. *See the illustration.*

shadow RAM \shad`ō ram`, R-A-M` n. *See* shadow memory.

shadow ROM \shad`ō rom`, R-O-M` n. *See* shadow memory.

Shadows

Shadows

Shadow print.

share \shâr` vb. To make files, directories, or folders accessible to other users over a network.

shared directory \shârd` dər-ek`tər-ē` n. *See* network directory.

shared folder \shârd` fōl`dər` n. On a Macintosh computer connected to a network and running System 6.0 or higher, a folder that a user has made available to others on the network. A shared folder is analogous to a network directory on a PC. *See also* network directory.

shared logic \shârd` loj`ik` n. The use, by multiple circuits or software routines, of common circuits or routines to implement an operation.

shared memory \shârd` mem`ər-ē` n. **1.** Memory accessed by more than one program in a multitasking environment. **2.** A portion of memory used by parallel-processor computer systems to exchange information. *See also* parallel processing.

shared network directory \shârd` net`wərk dər-ek`tər-ē` n. *See* network directory.

shared printer \shârd` prin`tər` n. A printer that receives input from more than one computer.

shared resource \shârd` rē`sōrs, rə-sōrs` n. **1.** Any device, data, or program used by more than one device or program. **2.** In Windows NT, any resource made available to network users, such as directories, files, and printers.

shareware \shâr`wâr` n. Copyrighted software that is distributed on a try-before-you-buy basis. Users who want to continue using the program after the trial period are encouraged to send a payment to the program's author. *Compare* free software, freeware, public-domain software.

sharpness \shärp`näs` n. *See* resolution (definition 1).

sheet-fed scanner \shēt`fed skan`ər` n. A scanner with a single-sheet feed mechanism, in which

video RAM

video RAM \vid'ē-ō ram', R-A-M' *n.* A special type of dynamic RAM (DRAM) used in high-speed video applications. Video RAM uses separate pins for the processor and the video circuitry, providing the video circuitry with a "back door" to the video RAM. The video circuitry can access the video RAM serially (bit by bit), which is more appropriate for transferring pixels to the screen than is the parallel access provided by conventional DRAM. *Acronym:* VRAM (V'ram, V'R-A-M'). *See also* dynamic RAM.

video server \vid'ē-ō sər'vər' *n.* A server designed to deliver digital video-on-demand and other broadband interactive services to the public over a wide area network.

video signal \vid'ē-ō sig'nəl' *n.* The signal sent from a video adapter or other video source to a raster display. The signal can include horizontal and vertical synchronization signals, as well as image information. *See also* composite video display, RGB monitor.

video terminal \vid'ē-ō tər'mə-nəl' *n.* *See* terminal (definition 1).

videotex \vid'ē-ō-teks' *n.* An interactive information retrieval service designed to be accessed by subscribers over telephone lines. Information can be displayed on a home television screen or a videotex terminal. Subscribers use keypads to choose from menus and to request specific screens, or pages. *Also called* videotext.

videotext \vid'ē-ō-tekst' *n.* *See* videotex.

Vienna Definition Language \vē-en'ə def-ə-nish'ən lang'wəj' *n.* *See* VDL.

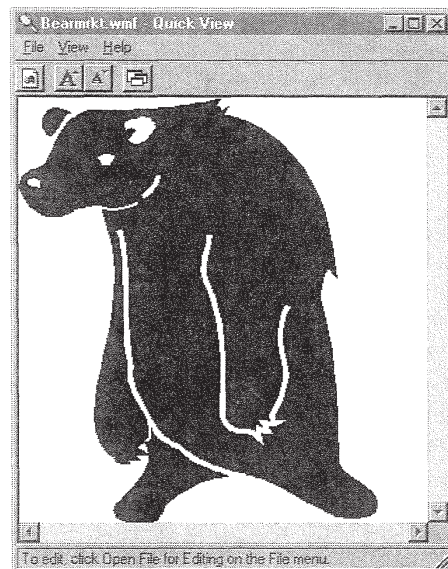
view¹ \vyōō' *n.* **1.** The display of data or an image from a given perspective or location. **2.** In relational database management systems, a logical table created through the specification of one or more relational operations on one or more tables. A view is equivalent to a divided relation in the relational model. *See also* relational database, relational model.

view² \vyōō' *vb.* To cause an application to display information on a computer screen.

viewer \vyōō'ər' *n.* An application that displays or otherwise outputs a file in the same way as the application that created the file. An example of a viewer is a program to display the images stored

virtual address

in GIF or JPEG files. *See the illustration. See also* GIF, JPEG.



Viewer.

viewport \vyōō'pōrt' *n.* In computer graphics, a view of a document or image. A viewport is similar to the view in a window, but usually only part of the document or graphical image is visible. *Compare* window.

vine \vīn' *n.* A means of distributing audiotape copies that is similar to a tape tree. Because vine tapes are digital in format, there is no degradation of sound quality as tapes are copied down the vine from one participant to the next. *Compare* tape tree.

virgule \vər'gyōōl' *n.* The forward slash (/) character. *Compare* backslash.

virtual \vər'chōō-əl' *adj.* Of or pertaining to a device, service, or sensory input that is perceived to be what it is not in actuality, usually as more "real" or concrete than it actually is.

virtual 8086 mode \vər'chōō-əl āt'ō-āt-siks' mōd' *n.* *See* virtual real mode.

virtual 86 mode \vər'chōō-əl ā-tē-siks' mōd' *See* virtual real mode.

virtual address \vər'chōō-əl a'dres, ə-dres' *n.* In a virtual memory system, the address that the

video RAM

video RAM \vid'ē-ō ram', R-A-M' *n.* A special type of dynamic RAM (DRAM) used in high-speed video applications. Video RAM uses separate pins for the processor and the video circuitry, providing the video circuitry with a "back door" to the video RAM. The video circuitry can access the video RAM serially (bit by bit), which is more appropriate for transferring pixels to the screen than is the parallel access provided by conventional DRAM. *Acronym:* VRAM (V'ram, V'R-A-M'). *See also* dynamic RAM.

video server \vid'ē-ō sər'vər' *n.* A server designed to deliver digital video-on-demand and other broadband interactive services to the public over a wide area network.

video signal \vid'ē-ō sig'nəl' *n.* The signal sent from a video adapter or other video source to a raster display. The signal can include horizontal and vertical synchronization signals, as well as image information. *See also* composite video display, RGB monitor.

video terminal \vid'ē-ō tər'mə-nəl' *n.* *See* terminal (definition 1).

videotex \vid'ē-ō-tek's' *n.* An interactive information retrieval service designed to be accessed by subscribers over telephone lines. Information can be displayed on a home television screen or a videotex terminal. Subscribers use keypads to choose from menus and to request specific screens, or pages. *Also called* videotext.

videotext \vid'ē-ō-tekst' *n.* *See* videotex.

Vienna Definition Language \vē-en'ə def-ə-nish'ən lang'wəj' *n.* *See* VDL.

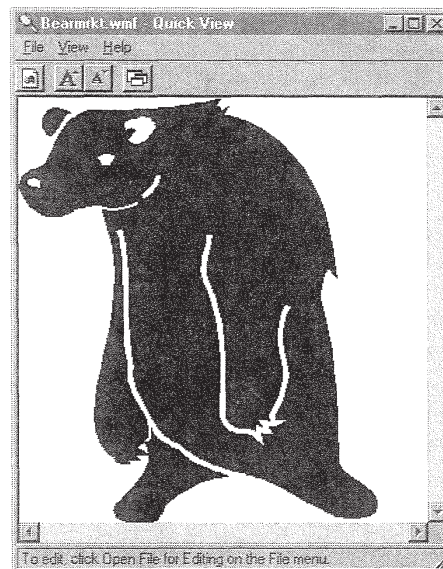
view¹ \vyōō' *n.* **1.** The display of data or an image from a given perspective or location. **2.** In relational database management systems, a logical table created through the specification of one or more relational operations on one or more tables. A view is equivalent to a divided relation in the relational model. *See also* relational database, relational model.

view² \vyōō' *vb.* To cause an application to display information on a computer screen.

viewer \vyōō'ər' *n.* An application that displays or otherwise outputs a file in the same way as the application that created the file. An example of a viewer is a program to display the images stored

virtual address

in GIF or JPEG files. *See the illustration. See also* GIF, JPEG.



Viewer.

viewport \vyōō'pōrt' *n.* In computer graphics, a view of a document or image. A viewport is similar to the view in a window, but usually only part of the document or graphical image is visible. *Compare* window.

vine \vīn' *n.* A means of distributing audiotape copies that is similar to a tape tree. Because vine tapes are digital in format, there is no degradation of sound quality as tapes are copied down the vine from one participant to the next. *Compare* tape tree.

virgule \vər'gyōōl' *n.* The forward slash (/) character. *Compare* backslash.

virtual \vər'chōō-əl' *adj.* Of or pertaining to a device, service, or sensory input that is perceived to be what it is not in actuality, usually as more "real" or concrete than it actually is.

virtual 8086 mode \vər'chōō-əl āt'ō-āt-siks' mōd' *n.* *See* virtual real mode.

virtual 86 mode \vər'chōō-əl ā-tē-siks' mōd' *See* virtual real mode.

virtual address \vər'chōō-əl a'dres, ə-dres' *n.* In a virtual memory system, the address that the

application uses to reference memory. The memory management unit (MMU) translates this address into a physical address before the memory is actually read or written to. *See also* physical address, virtual memory. *Compare* real address.

virtual channel \vərˈchɒd-əl ˈtʃənəl\ *n.* In Asynchronous Transfer Mode (ATM), the path taken by data sent from one sender to one receiver. *See also* ATM (definition 1), virtual path (definition 2).

virtual circuit \vərˈchɒd-əl sərˈkət\ *n.* A communications link that appears to be a direct connection between sender and receiver, although physically the link can be routed through a more circuitous path.

virtual community \vərˈchɒd-əl kə-myooˈnə-tē\ *n.* *See* online community.

Virtual Control Program Interface \vərˈchɒd-əl kən-trəlˈ prōˈgram inˈtər-fās\ *n.* A specification for MS-DOS programs to allow access to extended memory under a multitasking environment (for example, Microsoft Windows) for 386 and higher-level processors. *Acronym:* VCPI (VˈC-P-Iˈ). *See also* 80386DX, extended memory, multitasking. *Compare* protected mode.

virtual desktop \vərˈchɒd-əl deskˈtɒp\ *n.* A desktop enhancement tool that provides access to the desktop when it is covered by open windows or that expands the size of the working desktop. *See also* desktop.

virtual device \vərˈchɒd-əl də-vīs\ *n.* A device that can be referenced but that does not physically exist. Virtual-memory addressing, for example, uses magnetic disk storage to simulate memory larger than that physically available.

virtual device driver \vərˈchɒd-əl də-vīsˈ drī-vər\ *n.* Software in Windows 95 that manages a hardware or software system resource. If a resource retains information from one access to the next that affects the way it behaves when accessed (for example, a disk controller with its status information and buffers), a virtual device driver must exist for it. Virtual device drivers are described using three-letter abbreviations beginning with V and ending with D; the middle letter indicates the type of device, such as D for a display, P for a printer, T for a timer, and x when the type of device is not under discus-

sion. *Acronym:* VxD (Vˈ-X-Dˈ). *See also* device driver.

virtual disk \vərˈchɒd-əl disk\ *n.* *See* RAM disk.

virtual display device driver \vərˈchɒd-əl dis-plāˈ de-vīsˈ drī-vər\ *n.* *See* virtual device driver.

Virtual File Allocation Table \vərˈchɒd-əl filˈ ə-kāˈ shən tāˈbl\ *n.* *See* VFAT.

virtual image \vərˈchɒd-əl imˈəj\ *n.* An image that is stored in computer memory but is too large to be shown in its entirety on the screen. Scrolling and panning are used to bring unseen portions of the image into view. *See also* virtual screen.

virtual-image file \vərˈchɒd-əl imˈəj fil\ *n.* A file that specifies the material to be recorded onto a CD-ROM. A virtual-image file generally contains pointers to files that are distributed across a hard disk rather than gathered in one area. Since a complete copy of the material is not assembled, problems may occur in writing the CD-ROM due to delays in assembling the material from a scattered group of files. *See also* CD-ROM. *Compare* physical-image file.

virtual LAN \vərˈchɒd-əl lanˈ, L-A-Nˈ\ *n.* Short for **virtual local area network**. A local area network consisting of groups of hosts that are on physically different segments but that communicate as though they were on the same wire. *See also* LAN.

virtual machine \vərˈchɒd-əl mə-shēn\ *n.* Software that mimics the performance of a hardware device, such as a program that allows applications written for an Intel processor to be run on a Motorola chip. *Acronym:* VM (V-Mˈ).

virtual memory \vərˈchɒd-əl memˈər-ē\ *n.* Memory that appears to an application to be larger and more uniform than it is. Virtual memory may be partially simulated by secondary storage such as a hard disk. Applications access memory through virtual addresses, which are translated (mapped) by special hardware and software onto physical addresses. *Acronym:* VM (V-Mˈ). *Also called* disk memory. *See also* paging, segmentation.

virtual monitor \vərˈchɒd-əl monˈə-tər\ *n.* An enhanced monitor viewing system for visually impaired users that uses a virtual-reality headset to move enlarged text across the screen in a direction opposite to head motion. *See also* virtual reality.



application uses to reference memory. The memory management unit (MMU) translates this address into a physical address before the memory is actually read or written to. *See also* physical address, virtual memory. *Compare* real address.

virtual channel \vərˈchɒd-əl ˈtʃənəl\ *n.* In Asynchronous Transfer Mode (ATM), the path taken by data sent from one sender to one receiver. *See also* ATM (definition 1), virtual path (definition 2).

virtual circuit \vərˈchɒd-əl sərˈkət\ *n.* A communications link that appears to be a direct connection between sender and receiver, although physically the link can be routed through a more circuitous path.

virtual community \vərˈchɒd-əl kə-myooˈnə-tē\ *n.* *See* online community.

Virtual Control Program Interface \vərˈchɒd-əl kən-trəlˈ prōˈgram inˈtər-fās\ *n.* A specification for MS-DOS programs to allow access to extended memory under a multitasking environment (for example, Microsoft Windows) for 386 and higher-level processors. *Acronym:* VCPI (VˈC-P-Iˈ). *See also* 80386DX, extended memory, multitasking. *Compare* protected mode.

virtual desktop \vərˈchɒd-əl deskˈtɒp\ *n.* A desktop enhancement tool that provides access to the desktop when it is covered by open windows or that expands the size of the working desktop. *See also* desktop.

virtual device \vərˈchɒd-əl də-vīs\ *n.* A device that can be referenced but that does not physically exist. Virtual-memory addressing, for example, uses magnetic disk storage to simulate memory larger than that physically available.

virtual device driver \vərˈchɒd-əl də-vīsˈ drī-vər\ *n.* Software in Windows 95 that manages a hardware or software system resource. If a resource retains information from one access to the next that affects the way it behaves when accessed (for example, a disk controller with its status information and buffers), a virtual device driver must exist for it. Virtual device drivers are described using three-letter abbreviations beginning with V and ending with D; the middle letter indicates the type of device, such as D for a display, P for a printer, T for a timer, and x when the type of device is not under discus-

sion. *Acronym:* VxD (Vˈ-X-Dˈ). *See also* device driver.

virtual disk \vərˈchɒd-əl disk\ *n.* *See* RAM disk.

virtual display device driver \vərˈchɒd-əl dis-plāˈ de-vīsˈ drī-vər\ *n.* *See* virtual device driver.

Virtual File Allocation Table \vərˈchɒd-əl filˈ ə-kāˈ shən tāˈbl\ *n.* *See* VFAT.

virtual image \vərˈchɒd-əl imˈəj\ *n.* An image that is stored in computer memory but is too large to be shown in its entirety on the screen. Scrolling and panning are used to bring unseen portions of the image into view. *See also* virtual screen.

virtual-image file \vərˈchɒd-əl imˈəj fil\ *n.* A file that specifies the material to be recorded onto a CD-ROM. A virtual-image file generally contains pointers to files that are distributed across a hard disk rather than gathered in one area. Since a complete copy of the material is not assembled, problems may occur in writing the CD-ROM due to delays in assembling the material from a scattered group of files. *See also* CD-ROM. *Compare* physical-image file.

virtual LAN \vərˈchɒd-əl lanˈ, L-A-Nˈ\ *n.* Short for **virtual local area network**. A local area network consisting of groups of hosts that are on physically different segments but that communicate as though they were on the same wire. *See also* LAN.

virtual machine \vərˈchɒd-əl mə-shēn\ *n.* Software that mimics the performance of a hardware device, such as a program that allows applications written for an Intel processor to be run on a Motorola chip. *Acronym:* VM (V-Mˈ).

virtual memory \vərˈchɒd-əl memˈər-ē\ *n.* Memory that appears to an application to be larger and more uniform than it is. Virtual memory may be partially simulated by secondary storage such as a hard disk. Applications access memory through virtual addresses, which are translated (mapped) by special hardware and software onto physical addresses. *Acronym:* VM (V-Mˈ). *Also called* disk memory. *See also* paging, segmentation.

virtual monitor \vərˈchɒd-əl monˈə-tər\ *n.* An enhanced monitor viewing system for visually impaired users that uses a virtual-reality headset to move enlarged text across the screen in a direction opposite to head motion. *See also* virtual reality.



virtual name space

virtual name space \vərˈchōō-əl nāmˈ spās\ *n.* The set of all hierarchical sequences of names that can be used by an application to locate objects. One such sequence of names defines a path through the virtual name space, regardless of whether the hierarchy of names reflects the actual arrangement of objects around the system. For example, the virtual name space of a Web server consists of all possible URLs on the network on which it runs. *See also* URL.

virtual network \vərˈchōō-əl netˈwɜrk\ *n.* A part of a network that appears to a user to be a network of its own. For example, an Internet service provider can set up multiple domains on a single HTTP server so that each one can be addressed with its company's registered domain name. *See also* domain name, HTTP server (definition 1), ISP.

virtual path \vərˈchōō-əl pathˈ\ *n.* **1.** A sequence of names that is used to locate a file and that has the same form as a pathname in the file system but is not necessarily the actual sequence of directory names under which the file is located. The part of a URL that follows the server name is a virtual path. For example, if the directory *c:\bar\sin-ister\forces\distance* on the server *miles* is shared on the local area network at *foo.com* under the name *\\miles\baz* and contains the file *elena.html*, that file might be returned by a Web request for *http://miles.foo.com/baz/elena.html*. **2.** In Asynchronous Transfer Mode (ATM), a set of virtual channels that are switched together as a unit through the network. *See also* ATM (definition 1), virtual channel.

virtual peripheral \vərˈchōō-əl pər-ɪfˈər-əl\ *n.* A peripheral that can be referenced but does not physically exist. For example, an application might treat a serial port through which data is being transmitted as a printer, but the device receiving the data might be another computer instead.

virtual printer \vərˈchōō-əl prɪnˈtər\ *n.* A feature in many operating systems that allows printer output to be saved to a file until a printer becomes available.

virtual printer device driver \vərˈchōō-əl prɪnˈtər de-vīsˈ drīˈvər\ *n.* *See* virtual device driver.

virtual private network \vərˈchōō-əl prɪˈvət netˈwɜrk\ *n.* **1.** A set of nodes on a public network such as the Internet that communicate among

virtual screen

themselves using encryption technology so that their messages are as safe from being intercepted and understood by unauthorized users as if the nodes were connected by private lines. **2.** A wide area network formed of permanent virtual circuits (PVCs) on another network, especially a network using technologies such as ATM or frame relay. *Acronym:* VPN (VˈP-Nˈ). *See also* ATM (definition 1), frame relay, PVC.

virtual reality \vərˈchōō-əl rē-alˈə-tē\ *n.* A simulated 3-D environment that a user can experience and manipulate as if it were physical. The user sees the environment on display screens, possibly mounted in a special pair of goggles. Special input devices, such as gloves or suits fitted with motion sensors, detect the user's actions. *Acronym:* VR (V-Rˈ).

Virtual Reality Modeling Language \vərˈchōō-əl rē-alˈə-tē modˈə-lēŋg langˈwɜj\ *n.* *See* VRML.

virtual real mode \vərˈchōō-əl rēlˈ mōdˈ\ *n.* A feature of the Intel 80386 (SX and DX) and higher microprocessors that allows them to emulate several 8086 (real-mode) environments at the same time. The microprocessor provides a set of virtual registers and virtual memory space to each virtual 8086 environment. A program running in a virtual 8086 environment is completely protected from other virtual 8086 environments in the system and behaves as if it had control of the entire system. *Also called* V86 mode, virtual 8086 mode, virtual 86 mode. *See also* real mode.

virtual root \vərˈchōō-əl rōōtˈ, rōōtˈ\ *n.* The root directory that a user sees when connected to an Internet server, such as an HTTP or FTP server. The virtual root is actually a pointer to the physical root directory, which may be in a different location, such as another server. The advantages of using a virtual root include being able to create a simple URL for the Internet site and to move the root directory without affecting the URL. *Also called* v-root. *See also* pointer (definition 1), root directory, server (definition 2), URL.

virtual route \vərˈchōō-əl rōōtˈ, routˈ\ *n.* *See* virtual circuit.

virtual screen \vərˈchōō-əl skrēnˈ\ *n.* An image area that extends beyond the dimensions of the physical screen on the monitor, allowing manipulation of large documents or of multiple documents



virtual name space

virtual name space \vərˈchōō-əl nāmˈ spās\ *n.* The set of all hierarchical sequences of names that can be used by an application to locate objects. One such sequence of names defines a path through the virtual name space, regardless of whether the hierarchy of names reflects the actual arrangement of objects around the system. For example, the virtual name space of a Web server consists of all possible URLs on the network on which it runs. *See also* URL.

virtual network \vərˈchōō-əl netˈwɜrk\ *n.* A part of a network that appears to a user to be a network of its own. For example, an Internet service provider can set up multiple domains on a single HTTP server so that each one can be addressed with its company's registered domain name. *See also* domain name, HTTP server (definition 1), ISP.

virtual path \vərˈchōō-əl path\ *n.* **1.** A sequence of names that is used to locate a file and that has the same form as a pathname in the file system but is not necessarily the actual sequence of directory names under which the file is located. The part of a URL that follows the server name is a virtual path. For example, if the directory *c:\bar\sin-ister\forces\distance* on the server *miles* is shared on the local area network at *foo.com* under the name *\\miles\baz* and contains the file *elena.html*, that file might be returned by a Web request for *http://miles.foo.com/baz/elena.html*. **2.** In Asynchronous Transfer Mode (ATM), a set of virtual channels that are switched together as a unit through the network. *See also* ATM (definition 1), virtual channel.

virtual peripheral \vərˈchōō-əl pər-ɪfˈər-əl\ *n.* A peripheral that can be referenced but does not physically exist. For example, an application might treat a serial port through which data is being transmitted as a printer, but the device receiving the data might be another computer instead.

virtual printer \vərˈchōō-əl prɪnˈtər\ *n.* A feature in many operating systems that allows printer output to be saved to a file until a printer becomes available.

virtual printer device driver \vərˈchōō-əl prɪnˈtər de-vīsˈ drīˈvər\ *n.* *See* virtual device driver.

virtual private network \vərˈchōō-əl prɪˈvət netˈwɜrk\ *n.* **1.** A set of nodes on a public network such as the Internet that communicate among

virtual screen

themselves using encryption technology so that their messages are as safe from being intercepted and understood by unauthorized users as if the nodes were connected by private lines. **2.** A wide area network formed of permanent virtual circuits (PVCs) on another network, especially a network using technologies such as ATM or frame relay. *Acronym:* VPN (VˈP-Nˈ). *See also* ATM (definition 1), frame relay, PVC.

virtual reality \vərˈchōō-əl rē-alˈə-tē\ *n.* A simulated 3-D environment that a user can experience and manipulate as if it were physical. The user sees the environment on display screens, possibly mounted in a special pair of goggles. Special input devices, such as gloves or suits fitted with motion sensors, detect the user's actions. *Acronym:* VR (V-Rˈ).

Virtual Reality Modeling Language \vərˈchōō-əl rē-alˈə-tē modˈəl-ēŋg langˈwɜj\ *n.* *See* VRML.

virtual real mode \vərˈchōō-əl rēlˈ mōd\ *n.* A feature of the Intel 80386 (SX and DX) and higher microprocessors that allows them to emulate several 8086 (real-mode) environments at the same time. The microprocessor provides a set of virtual registers and virtual memory space to each virtual 8086 environment. A program running in a virtual 8086 environment is completely protected from other virtual 8086 environments in the system and behaves as if it had control of the entire system. *Also called* V86 mode, virtual 8086 mode, virtual 86 mode. *See also* real mode.

virtual root \vərˈchōō-əl rōōtˈ, rōōt\ *n.* The root directory that a user sees when connected to an Internet server, such as an HTTP or FTP server. The virtual root is actually a pointer to the physical root directory, which may be in a different location, such as another server. The advantages of using a virtual root include being able to create a simple URL for the Internet site and to move the root directory without affecting the URL. *Also called* v-root. *See also* pointer (definition 1), root directory, server (definition 2), URL.

virtual route \vərˈchōō-əl rōōtˈ, rout\ *n.* *See* virtual circuit.

virtual screen \vərˈchōō-əl skrēn\ *n.* An image area that extends beyond the dimensions of the physical screen on the monitor, allowing manipulation of large documents or of multiple documents



that lie partially outside the normal screen view. *See also* monitor.

virtual server \vərˈchōō-əl səˈvər\ *n.* A virtual machine that resides on an HTTP server but has the appearance to the user of being a separate HTTP server. Several virtual servers can reside on one HTTP server, each capable of running its own programs and each with individualized access to input and peripheral devices. Each virtual server has its own domain name and IP address and appears to the user as an individual Web site. Some Internet service providers use virtual servers for those clients who want to use their own domain names. *See also* domain name, HTTP server (definition 2), IP address.

virtual storefront \vərˈchōō-əl stōrˈfrənt\ *n.* A company's point of presence on the Web, providing opportunities for online sales. *Also called* electronic storefront.

virtual terminal \vərˈchōō-əl tərˈmə-nəl\ *n.* *See* terminal emulation.

virtual timer device driver \vərˈchōō-əl tīmər de-vīsˈ drīˈvər\ *n.* *See* virtual device driver.

virtual world \vərˈchōō-əl wɜrld\ *n.* **1.** A 3-D modeled environment, often created in VRML, where a user can interact with the viewer to change variables. *See also* viewer, VRML. **2.** An electronic environment that has no basis in the physical world. Multiuser dungeons (MUDs), talkers, and chat rooms are often considered virtual worlds. *See also* chat¹ (definition 1), MUD, talker.

virus \vīrˈus\ *n.* An intrusive program that infects computer files by inserting in those files copies of itself. The copies are usually executed when the file is loaded into memory, allowing them to infect still other files, and so on. Viruses often have damaging side effects—sometimes intentionally, sometimes not. For example, some viruses can destroy a computer's hard disk or take up memory space that could otherwise be used by programs. *See also* Good Times virus, Trojan horse, worm.

virus signature \vīrˈus sigˈnə-chur\ *n.* A portion of unique computer code contained in a virus. Antivirus programs search for known virus signatures to identify infected programs and files. *See also* virus.

visible page \vizˈə-bl pāj\ *n.* In computer graphics, the image that is being displayed on the

screen. Screen images are written into display memory in sections called pages, each of which contains one screen display.

Visual Basic \vizhˈōō-əl bāˈsik\ *n.* A high-level, visual-programming version of Basic. Visual Basic was developed by Microsoft for building Windows-based applications. *See also* Basic, Visual Basic for Applications, Visual Basic, Scripting Edition, visual programming.

Visual Basic for Applications \vizhˈōō-əl bāˈsik fər əˈplə-kāˈshənz\ *n.* A macro-language version of Visual Basic that is used to program many Windows 95 applications and is included with several Microsoft applications. *Acronym:* VBA (V-B-A). *See also* macro language, Visual Basic.

Visual Basic Script \vizhˈōō-əl bāˈsik skript\ *n.* *See* Visual Basic, Scripting Edition.

Visual Basic, Scripting Edition \vizhˈōō-əl bāˈsik skripˈtēng ə-dishˈən\ *n.* A subset of the Visual Basic for Applications programming language, optimized for Web-related programming. As with JavaScript, code for Visual Basic, Scripting Edition is embedded in HTML documents. This version is included with the Internet Explorer Web browser. *Also called* VBScript, Visual Basic Script. *See also* Visual Basic for Applications.

Visual C++ \vizhˈōō-əl Cˈplus-plus\ *n.* A Microsoft application development system for the programming language C++ that runs under MS-DOS and Windows. Visual C++ is a visual programming environment. *See also* visual programming. *Compare* Visual Basic, Visual J++.

visual interface \vizhˈōō-əl inˈtər-fās\ *n.* *See* graphical user interface.

visualization \vizhˈōō-əl ə-zāˈshən\ *n.* A feature of an application that displays data in the form of a video image. For example, some databases can interpret and show data in the form of a two- or three-dimensional model.

Visual J++ \vizhˈōō-əl Jˈplus-plus\ *n.* Microsoft's Java visual programming environment, which can be used to create applets and applications in the Java language. *See also* applet, Java, Java applet, visual programming.

visual programming \vizhˈōō-əl prōˈgram-ēng\ *n.* A method of programming using a programming environment or language in which basic program components can be selected through menu



point operations. The result of the test is given in units called *whetstones*. The Whetstone benchmark has fallen out of favor because it produces inconsistent results compared with other benchmarks such as the Dhrystone and the sieve of Eratosthenes. *See also* benchmark¹, Dhrystone, sieve of Eratosthenes.

WHIRLWIND \hwɜrlˈwind, wɜrlˈwind\ *n.* A digital computer using vacuum tubes, developed at Massachusetts Institute of Technology in the 1940s and used during the 1950s. The innovations introduced with WHIRLWIND included CRT displays and real-time processing. WHIRLWIND project members included Kenneth H. Olsen, who later founded Digital Equipment Corporation in 1957. *See also* CRT, real-time, vacuum tube.

whiteboard \hwītˈbɔrd, wītˈbɔrd\ *n.* Software that allows multiple users across a network to work together on a document that is simultaneously displayed on all the users' screens, as though they are all gathered around a physical whiteboard.

white noise \hwīt noɪzˈ, wīt\ *n.* Noise that contains components at all frequencies, at least within the frequency band of interest. It is called "white" by analogy to white light, which contains light at all the visible frequencies. In the audible spectrum, white noise is a hiss or a roar, such as that produced when a television set is tuned to a channel over which no station is broadcasting.

white pages \hwītˈ pājəz, wītˈ\ *n.* *See* DIB (definition 2).

white paper \hwītˈ pāˈpər, wītˈ\ *n.* An informal paper stating a position or proposing a draft specification, usually on a technical topic. *See also* specification (definition 1).

whois \hōō-izˈ\ *n.* **1.** An Internet service, provided by some domains, that enables a user to find e-mail addresses and other information for users listed in a database at that domain. **2.** A UNIX command to access the whois service. **3.** A command that displays a list of all users logged onto a Novell network.

whois client \hōō-iz klīˈənt\ *n.* A program (such as the UNIX whois command) that enables a user to access databases of usernames, e-mail addresses, and other information. *See also* whois.

whois server \hōō-iz sərˈvər\ *n.* Software that provides the usernames and e-mail addresses from a database (often listing people who have accounts at an Internet domain) to users who request the information using whois clients. *See also* whois.

Whole Earth 'Lectronic Link \hōlˈ ərthˈ lek-tronˈik lēnkˈ\ *n.* *See* WELL.

whole number \hōlˈ numˈbər\ *n.* A number without a fractional component—for example, 1 or 173; an integer.

Wide Area Information Server \wīdˈ âr-ē-ə in-fər-māˈshən sərˈvər\ *n.* *See* WAIS.

wide area network \wīdˈ âr-ē-ə netˈwɜrk\ *n.* A communications network that connects geographically separated areas. *Acronym:* WAN (W'A-N', wan).

wideband transmission \wīdˈband tranz-mishˈən\ *n.* *See* broadband network.

Wide SCSI or **Wide SCSI-2** \wīdˈ skuzˈē, S-C-S-Iˈ\ *n.* A form of the SCSI-2 interface that can transfer data 16 bits at a time at up to 20 megabytes per second. The Wide SCSI connector has 68 pins. *See also* SCSI, SCSI-2. *Compare* Fast SCSI, Fast/Wide SCSI.

widow \widˈō\ *n.* A last line of a paragraph, shorter than a full line, appearing at the top of a page. A widow is considered visually undesirable on the printed page. *Compare* orphan.

wildcard character \wīldˈkârd kârˈək-tər\ *n.* A keyboard character that can be used to represent one or many characters. The asterisk (*), for example, typically represents one or more characters, and the question mark (?) typically represents a single character. Wildcard characters are often used in operating systems as a means of specifying more than one file by name.

Win32 \winˈthər-tē-tōōˈ\ *n.* The application programming interface in Windows 95 and Windows NT that enables applications to use the 32-bit instructions available on 80386 and higher processors. Although Windows 95 and Windows NT support 16-bit 80x86 instructions as well, Win32 offers greatly improved performance. *See also* 16-bit machine, 32-bit machine, 80386DX, 8086, application programming interface, central processing unit, Win32s.