

Microsoft®

OVER
10,000
ENTRIES

Microsoft

Computer Dictionary

Fifth Edition

- Fully updated with the latest technologies, terms, and acronyms
- Easy to read, expertly illustrated
- Definitive coverage of hardware, software, the Internet, and more!



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

Copyright © 2002 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 Computer Dictionary.--5th ed.

p. cm.
ISBN 0-7356-1495-4
1. Computers--Dictionaries. 2. Microcomputers--Dictionaries.

AQ76.5. M52267 2002
004'.03--dc21 200219714

Printed and bound in the United States of America.

2 3 4 5 6 7 8 9 QWT 7 6 5 4 3 2

Distributed in Canada by H.B. Fenn and Company Ltd.

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. Visit our Web site at www.microsoft.com/mspress. Send comments to mspinput@microsoft.com.

Active Desktop, Active Directory, ActiveMovie, ActiveStore, ActiveSync, ActiveX, Authenticode, BackOffice, BizTalk, ClearType, Direct3D, DirectAnimation, DirectDraw, DirectInput, DirectMusic, DirectPlay, DirectShow, DirectSound, DirectX, Entourage, FoxPro, FrontPage, Hotmail, IntelliEye, IntelliMouse, IntelliSense, JScript, MapPoint, Microsoft, Microsoft Press, Mobile Explorer, MS-DOS, MSN, Music Central, NetMeeting, Outlook, PhotoDraw, PowerPoint, SharePoint, UltimateTV, Visio, Visual Basic, Visual C++, Visual FoxPro, Visual InterDev, Visual J++, Visual SourceSafe, Visual Studio, Win32, Win32s, Windows, Windows Media, Windows NT, Xbox are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Other product and company names mentioned herein may be the trademarks of their respective owners.

The example companies, organizations, products, domain names, e-mail addresses, logos, people, places, and events depicted herein are fictitious. No association with any real company, organization, product, domain name, e-mail address, logo, person, place, or event is intended or should be inferred.

Acquisitions Editor: Alex Blanton
Project Editor: Sandra Haynes

Body Part No. X08-41929



Apple Extended Keyboard.

Apple Filing Protocol *n.* See AFP.

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

Apple Macintosh *n.* See Macintosh.

Apple Newton *n.* See Newton.

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

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

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

AppleTalk *n.* An inexpensive local area network developed by Apple Computer, Inc., for Macintosh computers that can be used by Apple and non-Apple computers to communicate and share resources such as printers and file servers. Non-Apple computers must be equipped with AppleTalk hardware and suitable software. The network

uses a layered set of protocols similar to the ISO/OSI reference model and transfers information in the form of packets called frames. AppleTalk supports connections to other AppleTalk networks through devices known as bridges, and it supports connections to dissimilar networks through devices called gateways. See also bridge, frame (definition 2), gateway.

AppleTalk Phase 2 *n.* The extended AppleTalk Internet model designed by Apple Computer, Inc., that supports multiple zones within a network and extended addressing capacity.

AppleWorks *n.* A suite of productivity applications, formerly known as ClarisWorks, distributed by Apple Computer, Inc., and shipped on the iMac computer. AppleWorks/ClarisWorks is an integrated product that includes support for word processing, spreadsheets, databases, drawing, painting, charting, and the Internet.

appliance *n.* 1. See server appliance. 2. See information appliance. 3. A device with a single or limited purpose with functionality. This functionality is similar to a simple consumer appliance.

appliance server *n.* 1. An inexpensive computing device used for specific tasks including Internet connectivity or file-and-print services. The server is usually easy to use but does not possess the capabilities or software of a typical server for general office use. 2. See server appliance.

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

application binary interface *n.* A set of instructions that specifies how an executable file interacts with the hardware

audio response *n.* Any sound produced by a computer; specifically, spoken output produced by a computer in response to some specific type of input. Such output may be generated using a combination of words from a digitized vocabulary or through the synthesis of words from tables of phonemes. *See also* frequency response, phoneme.

audiotex *n.* An application allowing users to send and receive information by telephone. Users typically call an audiotex system and are presented with a series of choices or a series of questions through a voice mail system. When users select choices by pressing the buttons on the phone (rotary dial phones cannot be used for audiotex) or by speaking aloud, a database host responds by sending information to the voice mail system, which then converts the data to a spoken message for the user, or it responds by receiving and storing the information entered by the user. *Also called:* audiotext. *See also* voice mail.

audiotext *n.* *See* audiotex.

Audio Video Interleaved *n.* *See* AVI.

audiovisual *adj.* Relating to or being any material that uses a combination of sight and sound to present information.

audit *n.* In reference to computing, an examination of equipment, programs, activities, and procedures to determine how efficiently the overall system is performing, especially in terms of ensuring the integrity and security of data.

auditing *n.* The process an operating system uses to detect and record security-related events, such as an attempt to create, to access, or to delete objects such as files and directories. The records of such events are stored in a file known as a security log, whose contents are available only to those with the proper clearance. *See also* security log.

audit policy *n.* A policy that determines the security events to be reported to the network administrator.

audit trail *n.* In reference to computing, a means of tracing all activities affecting a piece of information, such as a data record, from the time it is entered into a system to the time it is removed. An audit trail makes it possible to document, for example, who made changes to a particular record and when.

AUI *n.* 1. Acronym for attachment unit interface. A 15-pin (DB-15) connector commonly used to connect a net-

work interface card to an Ethernet cable. 2. *See* aural user interface.

AUI cable *n.* Short for Attachment Unit Interface cable. A transceiver cable used to connect a host adapter within a computer to an Ethernet (10base5 or 10BaseF) network. *See also* 10Base5, 10Base-F, Ethernet (definition 1), transceiver cable.

AUP *n.* *See* acceptable use policy.

aural user interface *n.* Voice-activated interface that allows users to issue spoken commands to electronic devices. The aural user interface is used with features such as voice recognition for computers and voice-activated dialing for wireless phones. *Acronym:* AUI.

authentication *n.* In a multiuser or network operating system, the process by which the system validates a user's logon information. A user's name and password are compared against an authorized list, and if the system detects a match, access is granted to the extent specified in the permission list for that user. *See also* logon, password, permission, user account, user name.

authentication center *n.* Secure database used to identify and prevent wireless phone fraud. Authentication centers verify whether a wireless phone is registered with a wireless carrier's network.

Authentication Header *n.* *See* AH.

Authenticode *n.* A security feature of Microsoft Internet Explorer. Authenticode allows vendors of downloadable executable code (plug-ins or ActiveX controls, for example) to attach digital certificates to their products to assure end users that the code is from the original developer and has not been altered. Authenticode lets end users decide for themselves whether to accept or reject software components posted on the Internet before downloading begins. *See also* ActiveX control, Internet Explorer, security.

author¹ *vb.* 1. To create a product for implementation via computer technology. 2. To write a computer program. 3. To assemble multimedia components, such as graphics, text, audio, and animation, in a publication or product, for delivery on a CD-ROM or DVD or on line, to be viewed on a computer. 4. To create Web pages. Traditionally, to author meant to write a literary work or journalistic piece; in the cyberworld, to write is "to provide content"; thus, to author in the traditional sense is to be a "content provider."

author² *n.* *See* Web author.

C

voice/circuit-switched data, B channel, ISDN. *Compare* circuit-switched data.

circuit switching *n.* A method of opening communications lines, as through the telephone system, by creating a physical link between the initiating and receiving parties. In circuit switching, the connection is made at a switching center, which physically connects the two parties and maintains an open line between them for as long as needed. Circuit switching is typically used on the dial-up telephone network, and it is also used on a smaller scale in privately maintained communications networks. Unlike other methods of transmission, such as packet switching, it requires the link to be established before any communication can take place. *Compare* message switching, packet switching.

circular list *n.* A linked or chained list in which processing continues through all items, as in a ring, and returns to the starting point, no matter where that point is located in the list. *See also* linked list.

CIS *n.* 1. Acronym for CompuServe Information Service. *See* CompuServe. 2. Short for contact image sensor. A light-sensitive mechanism used in scanners and fax machines. A CIS scanner reflects light from a row of light-emitting diodes (LEDs) onto a document or other object and converts the reflected light to digital images. CIS sensors are smaller and lighter than the charge-coupled devices (CCDs) traditionally used in scanners, but the image quality they produce is not as good as the image quality produced by CCDs. *See also* light-emitting diode, scanner. *Compare* charge-coupled device.

CISC *n.* Acronym for complex instruction set computing. The implementation of complex instructions in a microprocessor design so that they can be invoked at the assembly language level. The instructions can be very powerful, allowing for complicated and flexible ways of calculating such elements as memory addresses. All this complexity, however, usually requires many clock cycles to execute each instruction. *Compare* RISC.

CIX *n.* *See* Commercial Internet Exchange.

CKO *n.* Acronym for Chief Knowledge Officer. A corporate executive in charge of management and distribution of all the business and technical knowledge of a company. The CKO maximizes the value of stored knowledge by ensuring that employees have access, and by avoiding knowledge loss caused by technology-based changes and upgrades in databases and other storage.

ClariNet *n.* A commercial service that distributes news articles from United Press International (UPI) and other news agencies in newsgroups that are part of the clari. hierarchy. Unlike most other newsgroups, access to the clari. newsgroups is restricted to Internet service providers who pay a subscription fee to ClariNet.

clari. newsgroups *n.* Internet newsgroups maintained by ClariNet Communications, Inc. ClariNet newsgroups contain news articles obtained from the Reuters and United Press International wire services, SportsTicker, Commerce Business Daily, and other sources. Unlike most other newsgroups, ClariNet groups are only accessible through Internet service providers who purchase the service. *See also* ClariNet, ISP, newsgroup.

ClarisWorks *n.* *See* AppleWorks.

class *n.* 1. In object-oriented programming, a generalized category that describes a group of more specific items, called *objects*, that can exist within it. A class is a descriptive tool used in a program to define a set of attributes or a set of services (actions available to other parts of the program) that characterize any member (object) of the class. Program classes are comparable in concept to the categories that people use to organize information about their world, such as *animal*, *vegetable*, and *mineral*, that define the types of entities they include and the ways those entities behave. The definition of classes in object-oriented programming is comparable to the definition of types in languages such as C and Pascal. *See also* object-oriented programming. 2. For hardware, the method for grouping particular types of devices and buses according to the basic ways that they can be installed and managed by the operating system. The hardware tree is organized by device class, and Windows uses class installers to install drivers for all hardware classes.

Class A IP address *n.* A unicast IP address that ranges from 1.0.0.1 through 126.255.255.254. The first octet indicates the network, and the last three octets indicate the host on the network. *See also* Class B IP address, Class C IP address, IP address classes.

Class A network *n.* An Internet network that can define a maximum of 16,777,215 hosts. Class A networks use the first byte of an IP address to designate the network, with the first (high-order) bit set to 0. The host is designated by the last 3 bytes. Class A addressing currently allows for a maximum of 128 networks. Class A networks are best suited for sites with few networks but numerous hosts and

C

for microcomputers based on Intel microprocessors. The first system, CP/M-80, was the most popular operating system for 8080- and Z80-based microcomputers. Digital Research also developed CP/M-86 for 8086/8088-based computers, CP/M-Z8000 for Zilog Z8000-based computers, and CP/M-68K for Motorola 68000-based computers. When the IBM PC and MS-DOS were introduced, common use of CP/M by end users dwindled. DRI continues to enhance the CP/M line, supporting multitasking with the Concurrent CP/M and MP/M products. *See also* MP/M.

CPM *n.* *See* critical path method.

CPRM *n.* Acronym for Content Protection for Recordable Media. Technology developed to control the use of copyrighted digital music and video material by blocking the transfer of protected files to portable media such as zip disks and smart cards. CPRM would be added to storage devices and provide data scrambling and identification codes to block the copying of copyrighted files.

cps *n.* *See* characters per second.

CPSR *n.* Acronym for Computer Professionals for Social Responsibility. A public advocacy organization of computer professionals. CPSR was originally formed out of concern over the use of computer technology for military purposes but has extended its interest to such issues as civil liberties and the effect of computers on workers.

CPU *n.* Acronym for central processing unit. The computational and control unit of a computer. The CPU is the device that interprets and executes instructions. Mainframes and early minicomputers contained circuit boards full of integrated circuits that implemented the CPU. Single-chip central processing units, called *microprocessors*, made possible personal computers and workstations. Examples of single-chip CPUs are the Motorola 68000, 68020, and 68030 chips and the Intel 8080, 8086, 80286, 80386, and i486 chips. The CPU—or microprocessor, in the case of a microcomputer—has the ability to fetch, decode, and execute instructions and to transfer information to and from other resources over the computer's main data-transfer path, the bus. By definition, the CPU is the chip that functions as the “brain” of a computer. In some instances, however, the term encompasses both the processor and the computer's memory or, even more broadly, the main computer console (as opposed to peripheral equipment). *See the illustration. See also* microprocessor.



CPU.

CPU-bound *adj.* *See* computation-bound.

CPU cache *n.* A section of fast memory linking the CPU (central processing unit) and main memory that temporarily stores data and instructions the CPU needs to execute upcoming commands and programs. Considerably faster than main memory, the CPU cache contains data that is transferred in blocks, thereby speeding execution. The system anticipates the data it will need through algorithms. *Also called:* cache memory, memory cache. *See also* cache, CPU, V-CACHE.

CPU cycle *n.* **1.** The smallest unit of time recognized by the CPU (central processing unit)—typically a few hundred-millionths of a second. **2.** The time required for the CPU to perform the simplest instruction, such as fetching the contents of a register or performing a no-operation instruction (NOP). *Also called:* clock tick.

CPU fan *n.* An electric fan usually placed directly on a CPU (central processing unit) or on the CPU's heat sink to help dissipate heat from the chip by circulating air around it. *See also* CPU, heat sink.

CPU speed *n.* A relative measure of the data-processing capacity of a particular CPU (central processing unit), usually measured in megahertz. *See also* CPU.

CPU time *n.* In multiprocessing, the amount of time during which a particular process has active control of the CPU (central processing unit). *See also* CPU, multiprocessing.

CR *n.* *See* carriage return.

crack *vb.* **1.** To gain unauthorized access to a network by breaching its security. **2.** To decipher encrypted information.

cracker *n.* A person who overcomes the security measures of a computer system and gains unauthorized access. The goal of some crackers is to obtain information ille-

data flow or **dataflow** *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 *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 *n.* The structure applied to data by an application program to provide a context in which the data can be interpreted.

data frame *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 *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 *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 *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 *n.* The accuracy of data and its conformity to its expected value, especially after being transmitted or processed.

data interchange format *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. *See also* ASCII.

data item *n.* *See* data element.

data library *n.* A cataloged collection of data files on disk or in another storage medium.

data link *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 (definition 1), DTE.

Data Link Connection Identifier *n.* A virtual circuit on frame relay networks that permanently identifies the path to a particular destination. *See also* frame relay, virtual circuit.

Data Link Control *n.* *See* DLC.

data link escape *n.* In data transmission, a control character that changes the meaning of the characters immediately following it.

data-link layer *n.* The second of seven layers in the ISO/OSI reference 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 the illustration. See also* ISO/OSI reference model.

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

Data-link layer on ISO/OSI reference model.

data management *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

D

Table E.1 Exclusive OR.

<i>a</i>	<i>b</i>	<i>a XOR b</i>
0	0	0
0	1	1
1	0	1
1	1	0

.exe *n.* In MS-DOS, a filename extension that indicates that a file is an executable program. To run an executable program, the user types the filename without the .exe extension at the prompt and presses Enter. *See also* executable program.

executable¹ *adj.* Of, pertaining to, or being a program file that can be run. Executable files have extensions such as .bat, .com, and .exe.

executable² *n.* A program file that can be run, such as file0.bat, file1.exe, or file2.com.

executable program *n.* A program that can be run. The term usually applies to a compiled program translated into machine code in a format that can be loaded into memory and run by a computer's processor. In interpreter languages, an executable program can be source code in the proper format. *See also* code (definition 1), compiler (definition 2), computer program, interpreter, source code.

execute *vb.* To perform an instruction. In programming, execution implies loading the machine code of the program into memory and then performing the instructions.

execute in place *n.* The process of executing code directly from ROM, rather than loading it from RAM first. Executing the code in place, instead of copying the code into RAM for execution, saves system resources. Applications in other file systems, such as on a PC Card storage device, cannot be executed in this way. *Acronym:* XIP.

execution time *n.* The time, measured in clock ticks (pulses of a computer's internal timer), required by a microprocessor to decode and carry out an instruction after it is fetched from memory. *Also called:* E-time. *See also* instruction time.

executive *n.* The set of kernel-mode components that form the base operating system for Microsoft Windows NT or later. *See also* operating system.

executive information system *n.* A set of tools designed to organize information into categories and reports. Because it emphasizes information, an executive information system differs from a decision support system

(DSS), which is designed for analysis and decision making. *Acronym:* EIS. *Compare* decision support system.

exerciser *n.* A program that exercises a piece of hardware or software by running it through a large set of operations.

exit *vb.* In a program, to move from the called routine back to the calling routine. A routine can have more than one exit point, thus allowing termination based on various conditions.

expanded *adj.* A font style that sets characters farther apart than the normal spacing. *Compare* condensed.

expanded memory *n.* A type of memory, up to 8 MB, that can be added to IBM PCs. Its use is defined by the Expanded Memory Specification (EMS). Expanded memory is not accessible to programs in MS-DOS, so the Expanded Memory Manager (EMM) maps pages (blocks) of bytes from expanded memory into page frames in accessible memory areas. Expanded memory is not needed in Windows 9x, all versions of Windows NT, and Windows 2000. *See also* EEMS, EMS, Expanded Memory Manager, page frame.

Expanded Memory Manager *n.* A driver that implements the software portion of the Expanded Memory Specification (EMS) to make expanded memory in IBM and compatible PCs accessible. *Acronym:* EMM. *See also* EMS, expanded memory, extended memory.

Expanded Memory Specification *n.* *See* EMS.

expansion *n.* A way of increasing a computer's capabilities by adding hardware that performs tasks that are not part of the basic system. Expansion is usually achieved by plugging printed circuit boards (expansion boards) into openings (expansion slots) inside the computer. *See also* expansion board, expansion slot, open architecture (definition 2), PC Card, PCMCIA slot.

expansion board *n.* A circuit board that is plugged into a computer's bus (main data transfer path) to add extra functions or resources to the computer. Typical expansion boards add memory, disk drive controllers, video support, parallel and serial ports, and internal modems. For laptops and other portable computers, expansion boards come in credit card-sized devices called PC Cards that plug into a slot in the side or back of the computer. *Also called:* expansion board, extender board. *See also* expansion slot, PC Card, PCMCIA slot.

expansion bus *n.* A group of control lines that provide a buffered interface to devices. These devices can be located

number can be changed if the font is installed in a system already having a font with that number. *See also* font.

font page *n.* A portion of video memory reserved for holding programmer-specified character definition tables (sets of character patterns) used for displaying text on the screen on IBM Multi-Color Graphics Array video systems.

font size *n.* The point size of a set of characters in a particular typeface. *See also* point¹ (definition 1).

font suitcase *n.* A file on Macintosh computers that contains one or more fonts or desk accessories. Such files are indicated in early versions of the operating system with the icon of a suitcase marked with a capital A. From System 7.0 onward, this icon is used to denote individual fonts.

foo *n.* A string used by programmers in place of more specific information. Variables or functions in code examples intended to demonstrate syntax, as well as temporary scratch files, may all appear with the name *foo*. Likewise, a programmer may type *foo* to test a string input handler. If a second placeholder string is needed, it will often be *bar*, suggesting that the origin of both is the U.S. Army phrase FUBAR (an acronym which, in discreet language, represents Fouled Up Beyond All Recognition/Repair). However, other origins have been claimed. *Compare* fred (definition 2).

footer *n.* One or more identifying lines printed at the bottom of a page. A footer may contain a folio (page number), a date, the author's name, and the document title. *Also called:* running foot. *Compare* header (definition 1).

footprint *n.* The surface area occupied by a personal computer or other device.

force *vb.* In programming, to perform a particular action that would normally not occur. The term is most often used in the context of forcing data to be within a particular range of values—for example, forcing a divisor to be non-zero. *See also* cast.

force feedback *n.* A technology that generates push or resistance in an input/output device. Force feedback enables an input/output device, such as a joystick or a steering wheel, to react to the user's action in appropriate response to events displayed on the screen. For example, force feedback can be used with a computer game to react to a plane rising in a steep ascent or a race car turning a tight corner. *See also* input/output device.

foreground¹ *adj.* Currently having control of the system and responding to commands issued by the user. *See also* multitasking. *Compare* background¹.

foreground² *n.* 1. The color of displayed characters and graphics. *Compare* background² (definition 1). 2. The condition of the program or document currently in control and affected by commands and data entry in a windowing environment. *Compare* background² (definition 4).

forest *n.* A collection of one or more domains in Microsoft Windows that share a common schema, configuration, and global catalog and are linked with two-way transitive trusts. *See also* domain, global catalog, schema, transitive trust, two-way trust.

fork¹ *n.* One of the two parts of a file recognized by the Mac OS. A Macintosh file has a data fork and a resource fork. Most or all of a typical user-produced document is in the data fork; the resource fork usually contains application-oriented information, such as fonts, dialog boxes, and menus. *See also* data fork, resource fork.

fork² *vb.* To initiate a child process in a multitasking system after a parent process has been started. *See also* multitasking.

fork bomb *n.* In UNIX-based systems, a program or shell script that locks up the system by recursively spawning copies of itself using the Unix system call "fork(2)" until they occupy all the process table entries. *Also called:* logic bomb.

FOR loop *n.* A control statement that executes a section of code a specified number of times. Actual syntax and usage vary from language to language. In most cases, the value of an index variable moves through a range of values, being assigned a different (and usually consecutive) value each time the program moves through the section of code. *See also* iterative statement, loop¹ (definition 1). *Compare* DO loop.

form *n.* 1. A structured document with spaces reserved for entering information and often containing special coding as well. 2. In some applications (especially databases), a structured window, box, or other self-contained presentation element with predefined areas for entering or changing information. A form is a visual filter for the underlying data it is presenting, generally offering the advantages of better data organization and greater ease of viewing. 3. In optical media, a data storage format used in compact disc technology. 4. In programming, a metalanguage (such as Backus-Naur form) used to describe the syntax of a language. *See also* Backus-Naur form.

formal language *n.* A combination of syntax and semantics that completely defines a computer language. *See also* Backus-Naur form, semantics (definition 1), syntax.



J

J2EE *n.* Acronym for Java 2 Platform Enterprise Edition. An application server framework from Sun Microsystems, Inc., for the development of distributed applications. It includes all the previous Java APIs targeted for multi-tiered distributed enterprise information systems. The J2EE platform consists of a set of services, application programming interfaces (APIs), and protocols that provide the functionality for developing multitiered, Web-based applications. *See also* application programming interface, Enterprise Java Beans, IDL, Java, JDBC, Jini, JMS, JNDI, JSP, JTA, JTS, RMI-IIOP.

J *n.* A high-level programming language created by Kenneth Iverson, developer of APL, and Roger Hui. J is a successor language to APL that may be run on many platforms, including Windows 95, Windows NT, Macintosh, Linux, RS/6000, and Sun Sparc. Like APL, J is used primarily by mathematicians. *See also* APL.

jabber *n.* A continuous stream of random data transmitted over a network as the result of some malfunction.

Jabber *n.* An XML-based instant messaging system. Jabber software is available for most operating systems and allows user access to other instant messaging services. Jabber is an open source application overseen by Jabber.org.

jack *n.* A connector designed to receive a plug. A jack is commonly used in making audio and video connections.

jacket *n.* *See* disk jacket.

jack in *vb.* 1. To log on to a computer. 2. To connect to a network or BBS, especially for purposes of entering an IRC or a virtual reality simulation, such as a MUD. (To leave is to *jack out*.) *See also* IRC, MUD.

jack out *vb.* 1. To log off a computer. 2. To disconnect from a network or online bulletin board system. *See also* jack in, log on.

Jacquard loom *n.* The first machine that used punched cards to control its operation. In this loom, developed in 1801 by French inventor Joseph-Marie Jacquard, up to 24,000 cards were placed on a rolling drum. Where a hole was punched on a card, one of a set of rods could pass

through and select a particular thread to be woven into the pattern. Jacquard was awarded a medal by the Emperor Napoleon for his invention. Later in the nineteenth century, punched cards were used in Charles Babbage's computerlike Analytical Engine and in Herman Hollerith's statistical tabulating machine. *See also* Analytical Engine, Hollerith tabulating/recording machine.

jaggies *n.* The "stairsteps" that appear in diagonal lines and curves drawn at low resolutions in computer graphics. *Also called:* aliasing.

Janet *n.* Short for the Joint Academic Network. A wide area network in the United Kingdom that serves as the principal backbone for the Internet in that country. *See also* backbone (definition 1).

jar *n.* A file name extension that identifies a compressed JAR (Java Archive) file. Note: By changing the .jar extension to .zip, you can use popular extraction tools such as PKZIP or WINZIP to look at a .jar file's contents. *See also* compressed file, JAR, PKZIP, .zip.

JAR *n.* Acronym for Java Archive file. JAR files allow Java developers to efficiently deploy Java classes and their associated resources. The elements in a JAR file are compressed just as in a standard zip file. JAR files include a security mechanism and a special META-INF directory that contains administrative information about the contents of the files. Using a combination of a digital signature and the META-INF data, JAR files can be signed to ensure authenticity and security. *See also* .jar.

Java *n.* An object-oriented programming language developed by Sun Microsystems, Inc. Similar to C++, Java is smaller, more portable, and easier to use than C++ because it is more robust and it manages memory on its own. Java was also designed to be secure and platform-neutral (meaning that it can be run on any platform) through the fact that Java programs are compiled into bytecode, which is not refined to the point of relying on platform-specific instructions and runs on a computer in a special software environment known as a virtual machine. This characteristic of Java makes it a useful language for programming

no-operation instruction *n.* A machine instruction that has no results other than to cause the processor to use up clock cycles. Such instructions are useful in certain situations, such as padding out timing loops or forcing subsequent instructions to align on certain memory boundaries. *Acronym:* NO-OP, NOP. *See also* machine instruction.

NOP *n.* *See* no-operation instruction.

NOR gate *n.* Short for **NOT OR gate**. A digital circuit whose output is true (1) only if all inputs are false (0). A NOR gate is an OR circuit (output with the value of 1 if any input value is 1) followed by a NOT circuit (output that is the logical complement of the input). *See also* gate (definition 1), NOT gate, OR gate.

normal distribution *n.* In statistics, a type of function that describes the probabilities of the possible values of a random variable. The function, whose graph is the familiar bell-shaped curve, can be used to determine the probability that the value of the variable will fall within a particular interval of values.

normal form *n.* **1.** In a relational database, an approach to structuring (organizing) information in order to avoid redundancy and inconsistency and to promote efficient maintenance, storage, and updating. Several "rules" or levels of normalization are accepted, each a refinement of the preceding one. Of these, three forms are commonly used: first normal (1NF), second normal (2NF), and third normal (3NF). First normal forms, the least structured, are groups of records (such as employee lists) in which each field (column) contains unique and nonrepeating information. Second and third normal forms break down first normal forms, separating them into different tables by defining successively finer interrelationships between fields. Second normal forms do not include fields that are subsets of fields other than the primary (key) field; for example, a second normal form keyed to employee name would not include both job grade and hourly rate if pay were dependent on job grade. Third normal forms do not include fields that provide information about fields other than the key field; for example, a third normal form keyed to employee name would not include project name, crew number, and supervisor unless the crew number and supervisor were assigned only to the project the employee was working on. Further normalization refinements include Boyce-Codd Normal Form (BCNF), fourth normal form (4NF), and projection-join (or fifth) normal form (PJ/NF or 5NF). These levels, however, are not as commonly used as the first, second, and third normal forms. **2.** In program-

ming, the metalanguage sometimes called the Backus normal form (Backus-Naur form)—a language used for describing the syntax of other languages, specifically ALGOL 60, for which it was invented. *See also* Backus-Naur form.

normal hyphen *n.* *See* hyphen.

normalize *vb.* **1.** In programming, to adjust the fixed-point and exponent portions of a floating-point number to bring the fixed-point portions within a specific range. **2.** In database management, to apply a body of techniques to a relational database in order to minimize the inclusion of duplicate information. Normalization greatly simplifies query and update management, including security and integrity considerations, although it does so at the expense of creating a larger number of tables. *See also* normal form (definition 1).

North American Cellular Network *n.* Telecommunications network that enables wireless phone users in North America to send and receive calls when roaming outside their service area. *Acronym:* NACN.

NOS *n.* *See* network operating system.

NOT *n.* An operator that performs Boolean or logical negation. *See also* Boolean operator, logical operator.

NOT AND *n.* *See* NAND.

notation *n.* In programming, the set of symbols and formats used to describe the elements of programming, mathematics, or a scientific field. A language's syntax is defined in part by notation. *See also* syntax.

notebook computer *n.* *See* portable computer.

NOT gate *n.* One of the three basic logic gates (with AND and OR) from which all digital systems can be built. The NOT circuit, also referred to as an *inverter*, has output that is the reverse of its input—that is, the output is true (1) if the input is false (0) and false (0) if the input is true (1). *See also* AND gate, gate (definition 1), OR gate.

notification *n.* A signal from the operating system that an event has occurred.

Novell Directory Services *n.* *See* NDS.

Novell NetWare *n.* *See* NetWare.

NPN transistor *n.* A type of transistor in which a base of P-type material is sandwiched between an emitter and a collector of N-type material. The base, emitter, and collector are the three terminals through which current flows. In

pop *vb.* To fetch the top (most recently added) element of a stack, removing that element from the stack in the process. *Compare* push² (definition 1).

POP *n.* *See* point of presence, Post Office Protocol.

POP3 *n.* Acronym for **Post Office Protocol 3**. This is the current version of the Post Office Protocol standard in common use on TCP/IP networks. *See also* Post Office Protocol, TCP/IP.

populate *vb.* 1. To put chips in the sockets of a circuit board. 2. To import prepared data into a database from a file using a software procedure rather than by having a human operator enter individual records.

pop-under ad *n.* An advertisement on the Internet that appears in a new window in the background, behind the Web site content. Users may be unaware of the presence of pop-under ads until they close foreground windows at the end of a Web session. Pop-under ads may appear in response to a mouse click, a rollover, or after a user has spent a predetermined amount of time at a Web site. *See also* pop-up ad.

pop-up ad *n.* An advertisement on the Internet that appears in a new window in the foreground, often whenever a new page is opened within a site. Pop-up ads may appear in response to a mouse click, a rollover, or after a user has spent a predetermined amount of time at a Web site. *See also* pop-under ad.

pop-up Help *n.* An online help system whose messages appear as pop-up windows when the user clicks on a topic or area of the screen about which help is desired. Typically, a special form of click, such as clicking the right mouse button or Option-clicking, will activate pop-up Help, if it is available. *See also* Balloon Help.

pop-up menu or **popup menu** *n.* In a graphical user interface, a menu that appears on-screen when a user selects a certain item. Pop-up menus can appear anywhere on the screen and generally disappear when the user selects an item in the menu. *Also called:* popup. *Compare* drop-down menu, pull-down menu.

pop-up messages *n.* The messages that appear when pop-up Help is used.

pop-up window *n.* A window that appears when an option is selected. Typically, the window remains visible until the mouse button is released.

port¹ *n.* 1. An interface through which data is transferred between a computer and other devices (such as a printer, mouse, keyboard, or monitor), a network, or a direct connection to another computer. The port appears to the CPU as one or more memory addresses that it can use to send or receive data. Specialized hardware, such as in an add-on circuit board, places data from the device in the memory addresses and sends data from the memory addresses to the device. Ports may also be dedicated solely to input or to output. Ports typically accept a particular type of plug used for a specific purpose. For example, a serial data port, a keyboard, and a high-speed network port all use different connectors, so it's not possible to plug a cable into the wrong port. *Also called:* input/output port. 2. port number.

port² *vb.* 1. To change a program in order to be able to run it on a different computer. 2. To move documents, graphics, and other files from one computer to another.

port 25 blocking *n.* An anti-spam technique adopted by many ISPs to prevent bulk mailings of unsolicited commercial e-mail. Spammers may try to use SMTP servers to relay a single commercial e-mail to multiple recipients. Port 25 blocking filters prevent this spam distribution method. Although it is a popular remedy for some spam problems, port 25 blocking may cause problems for legitimate users of non-compatible e-mail programs.

portable *adj.* 1. Capable of running on more than one computer system or under more than one operating system. Highly portable software can be moved to other systems with little effort, moderately portable software can be moved only with substantial effort, and nonportable software can be moved only with effort similar to or greater than the effort of writing the original program. 2. Light enough, rugged enough, and free enough of encumbering external connections to be carried by a user.

portable computer *n.* Any computer designed to be moved easily. Portable computers can be characterized by size and weight. *See* the table.

P

Because each quantum bit—called a qubit—represents multiple values, a quantum computer can be in multiple states simultaneously and can thus work on numerous problems at the same time to offer far more computing power than is currently available. Quantum computing is under investigation by the United States Defense Advanced Research Projects Agency (DARPA) and other groups. Although atoms of hydrogen and carbon have been used to create the rudiments of a quantum computer, the technology is still in its infancy.

quarter-inch cartridge *n.* See QIC (definition 1).

Quartz *n.* The 2-D drawing engine that forms the imaging foundation of the Mac OS X Aqua interface. The Quartz graphics application programming interface (API) is based on Adobe's Portable Document Format (PDF) standard.

quartz crystal *n.* A precisely shaped and precisely sized piece of the mineral quartz, used for its piezoelectric properties. When a voltage is applied to a quartz crystal, it vibrates at a frequency determined by its size and shape. Quartz crystals are commonly used to control the frequency of oscillator circuits such as the clocks in microcomputers. *See also* piezoelectric.

quasi-language *n.* A derogatory term for any programming language that, because of deficiencies, is not suitable for any serious work.

qubit *n.* Short for **quantum bit**. The bits (currently, atomic particles) that make up the theoretical machines known as quantum computers. Qubits are unlike bits in current computers in that they exist in more than one state at the same time. They can, therefore, represent both 0 and 1 simultaneously. Qubits, like quantum computers, are based on the science of quantum mechanics.

query¹ *n.* A specific set of instructions for extracting particular data.

query² *vb.* To extract data from a database and present it for use.

query by example *n.* A simple-to-use query language implemented on several relational database management systems. Using query by example, the user specifies fields to be displayed, intertable linkages, and retrieval criteria directly onto forms displayed on the screen. These forms are a direct pictorial representation of the table and row structures that make up the database. Thus, the construction of a query becomes a simple "checkoff" procedure from the viewpoint of the user. *Acronym:* QBE.

query language *n.* A subset of the data manipulation language; specifically, that portion relating to the retrieval and display of data from a database. It is sometimes used loosely to refer to the entire data manipulation language. *See also* data manipulation language.

question mark *n.* *See* ?.

queue¹ *n.* A multi-element data structure from which (by strict definition) elements can be removed only in the same order in which they were inserted; that is, it follows a first in, first out (FIFO) constraint. There are also several types of queues in which removal is based on factors other than order of insertion—for example, some priority value assigned to each element. *See also* deque, element (definition 1). *Compare* stack.

queue² *vb.* To place (an item) in a queue.

queued access method *n.* A programming technique that minimizes input/output delays by synchronizing the transfer of information between the program and the computer's input and output devices. *Acronym:* QAM.

queuing *n.* In networking, the process of buffering data in preparation for transmission. *See also* fair queuing; first in, first out; last in, first out; weighted fair queuing.

QuickDraw *n.* On the Apple Macintosh, the built-in group of routines within the operating system that controls the display of graphics and text. Application programs call QuickDraw for on-screen displays. *See also* Toolbox.

QuickDraw 3-D *n.* A version of the Macintosh QuickDraw library that includes routines for doing 3-D graphics calculations. *See also* QuickDraw.

Quicken *n.* Financial-management software from Intuit, Inc. The personal-finance version, introduced by Intuit in 1984, includes tools for balancing and tracking bank accounts and investments, budgeting, paying bills, planning and preparing tax returns, financial planning, and estate planning. A small-business version, Quicken Home & Business, adds tools for business-related matters, such as invoicing and accounts receivable and payable.

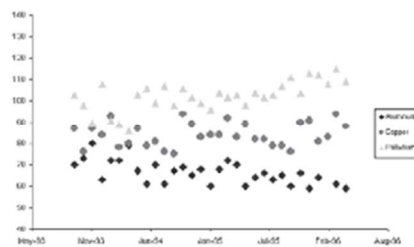
quicksort *n.* An efficient sort algorithm, described by C.A.R. Hoare in 1962, in which the essential strategy is to "divide and conquer." A quicksort begins by scanning the list to be sorted for a median value. This value, called the *pivot*, is then moved to its final position in the list. Next, all items in the list whose values are less than the pivot value are moved to one side of the list, and the items with values greater than the pivot value are moved to the other

Q

(OCR) software or graphics software. Scanners come in a number of types, including flatbed (scan head passes over a stationary subject), feed (subject is pulled across a stationary scan head), drum (subject is rotated around a stationary scan head), and handheld (user passes device over a stationary subject).

scan rate *n.* See refresh rate.

scatter diagram *n.* A graph consisting of points whose coordinates represent values of data, often used to illustrate a correlation between one or more variables and a test group. See the illustration. *Also called:* point chart, point diagram.



Scatter diagram.

schedule *vb.* To program a computer to perform a specified action at a specified time and date.

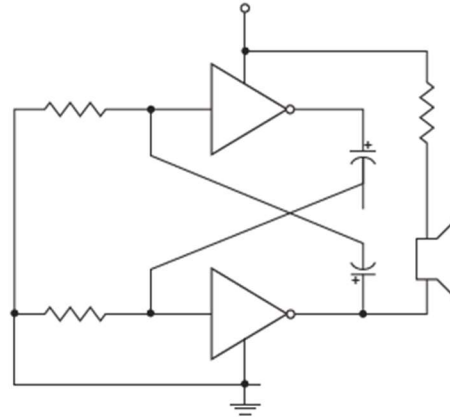
scheduler *n.* An operating-system process that starts and ends tasks (programs), manages concurrently running processes, and allocates system resources. *Also called:* dispatcher.

scheduling algorithm *n.* An algorithm that governs the proper timing of a sequence of events in an operating system or application. For example, an effective motion graphics scheduling algorithm would be able to retrieve the graphic objects, process them, and display them without causing stutter or disruptions. *See also* algorithm.

schema *n.* A description of a database to a database management system (DBMS) in the language provided by the DBMS. A schema defines aspects of the database, such as attributes (fields) and domains and parameters of the attributes.

schematic *n.* A diagram that shows a circuit's components and the connections between them using lines and a

set of standard symbols to represent various electronic components. See the illustration.



Schematic.

Schottky diode *n.* A type of diode (device that passes current in one direction) in which a semiconductor layer and a metal layer are brought into contact. It is characterized by very fast switching speeds. *Also called:* hot carrier diode, Schottky barrier diode.

scientific notation *n.* A floating-point method of representing a number, especially a very large or very small one, in which numbers are expressed as products consisting of a number between 1 and 10 multiplied by a power of 10. Scientific notation commonly uses the letter E in place of "times 10," as in 5.0E3, meaning 5.0 times 10 to the third power, or 10^3 . *See also* floating-point notation.

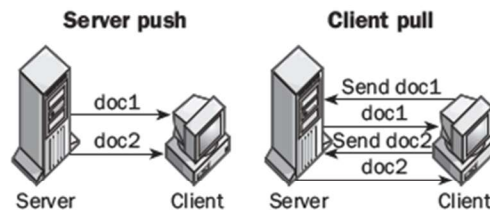
sci. newsgroups *n.* Usenet newsgroups that are part of the sci. hierarchy and begin with "sci." These newsgroups are devoted to discussions of scientific research and applications, except for computer science, which is discussed in the comp. newsgroups. *See also* newsgroup, traditional newsgroup hierarchy, Usenet. *Compare* comp. newsgroups, misc. newsgroups, news. newsgroups, rec. newsgroups, soc. newsgroups, talk. newsgroups.

scissoring *n.* See clip.

scope *n.* 1. In programming, the extent to which an identifier, such as a constant, data type, variable, or routine, can be referenced within a program. Scope can be global

S

server push-pull *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-pull.

server-side include *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. *Acronym:* SSI. *See also* server (definition 2).

service *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. 3. In networking, specialized, software-based functionality provided by network servers—for example, directory services that provide the network equivalent of “phone books” needed for locating users and resources. *See also* utility.

Service Advertising Protocol *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 off line, it uses the protocol to announce that it is no longer available. *Acronym:* SAP. *See also* server (definition 1).

service bureau *n.* 1. A company that provides various services related to publishing, such as prepress production, desktop publishing, typesetting, imagesetting, and optical scanning of graphics. 2. An organization that provides data processing services and access to software packages for a fee.

service provider *n.* *See* ISP.

servlet or **servelet** *n.* A small Java program that runs on a server. The term is a companion to applet, a Java program that usually runs on the client. Servlets perform lightweight Web services, such as redirecting a Web user from an outdated address to the correct page—tasks traditionally handled by CGI (Common Gateway Interface) applications. Because servlets are automatically threaded and highly responsive, they execute quickly, thereby reducing system overhead. *Also called:* serverlet. *See also* applet, CGI.

servlet container *n.* In Sun Microsystems's J2EE network platform, a container that decodes requests, formats responses, and provides the network services over which requests and responses are sent. All servlet containers must support HTTP as a protocol for requests and responses, but they may also support additional request-response protocols such as HTTPS. *See also* container, HTTP, HTTPS, J2EE.

servo *n.* The part of a servomechanism, controlled by the servomechanism's feedback circuit, that produces the final mechanical output. *Also called:* servomotor. *See also* servomechanism.

servomechanism *n.* A control system in which the final output is mechanical movement. A servomechanism uses feedback to control the position, velocity, or acceleration of a mechanical component. *Also called:* servo system.

servomotor *n.* *See* servo.

servo system *n.* *See* servomechanism.

session *n.* 1. The time during which a program is running. In most interactive programs, a session is the time during which the program accepts input and processes information. 2. In communications, the time during which two computers maintain a connection. 3. A specific protocol layer in the ISO/OSI reference model that manages communication between remote users or processes. *See also* ISO/OSI reference model, session layer.

session bean *n.* In the Java programming language and J2EE network platform, an enterprise bean that is created

S

symbolic address *n.* A memory address that can be referred to in a program by name rather than by number.

symbolic coding *n.* The expression of an algorithm in words, decimal numbers, and symbols rather than in binary numbers, so that a person can read and understand it. Symbolic coding is used in high-level programming languages. *See also* algorithm, high-level language.

symbolic language *n.* A computer language that uses symbols such as keywords, variables, and operators to form instructions. All computer languages except machine language are symbolic.

symbolic link *n.* A disk directory entry that takes the place of a directory entry for a file but is actually a reference to a file in a different directory. *Also called:* alias, shortcut, soft link, symlink.

symbolic logic *n.* A representation of the laws of reasoning, so named because symbols rather than natural-language expressions are used to state propositions and relationships. *See also* logic.

symbol set *n.* Any collection of symbols legitimized by a data-coding system, such as extended ASCII, or a programming language.

symbol table *n.* A list of all identifiers encountered when a program is compiled (or assembled), their locations in the program, and their attributes, such as variable, routine, and so on. *See also* compile, identifier, linker, module (definition 1), object code.

symlink *n.* *See* symbolic link.

symmetric digital subscriber line *n.* *See* SDSL.

symmetric multiprocessing *n.* *See* SMP.

symmetric multiprocessing server *n.* *See* SMP server.

SYN *n.* Short for synchronous idle character. A character used in synchronous (timed) communications that enables the sending and receiving devices to maintain the same timing. *Also called:* sync character.

sync character *n.* *See* SYN.

syncDRAM *n.* *See* SDRAM.

synchronization *n.* **1.** In networking, a communications transmission in which multibyte packets of data are sent and received at a fixed rate. *See also* packet (definition 1). **2.** In networking, the matching of timing between computers on the network. All of the computers are generally assigned identical times to facilitate and coordinate com-

munications. **3.** In a computer, the matching of timing between components of the computer so that all are coordinated. For instance, operations performed by the operating system are generally synchronized with the signals of the machine's internal clock. *See also* clock (definition 1), operating system. **4.** In application or database files, version comparisons of copies of the files to ensure they contain the same data. **5.** In multimedia, precise real-time processing. Audio and video are transmitted over a network in synchronization so that they can be played back together without delayed responses. *See also* real-time. **6.** In handheld computing, the process of updating or backing up the data on a handheld computer to the linked software applications on a desktop computer. Data changes made on the desktop computer may also be copied to the handheld during synchronization. *See also* partnership.

synchronization signal *n.* *See* sync signal.

synchronize *vb.* To cause to occur at the same time.

Synchronized Multimedia Integration Language *n.* *See* SMIL.

synchronous *adj.* Occurring at the same time. In computer transmissions, a reference to activity governed by a clock or by synchronized timing.

synchronous burst static RAM *n.* A type of static RAM that is synchronized with the system clock. Synchronous burst static RAM is used in a computer's L2 cache, where frequently accessed information is stored for fast retrieval by the CPU. Synchronous burst static RAM is faster than asynchronous static RAM but is limited to a maximum bus speed of 66 MHz. Computers running at faster speeds can use another form of cache memory known as pipeline burst static RAM. *Also called:* sync SRAM. *See also* L2 cache, static RAM. *Compare* asynchronous static RAM, dynamic RAM, pipeline burst static RAM.

synchronous communications *n.* Computer-to-computer communications in which transmissions are synchronized by timing between the sending and receiving machines.

Synchronous Data Link Control *n.* *See* SDLC.

Synchronous Digital Hierarchy *n.* An ITU recommendation implemented in Europe and similar in most respects to the SONET standard used in North America and Japan. *See also* SONET.

permits complex data structures to be transmitted, processed, and returned between different operating systems running in different environments.

XML Schema *n.* A specification providing a common base for data description and validation in XML environments. XML schema replaces Document Type Definition (DTD) by defining a greater set of data types with more explicit data descriptions. XML schema has been developed as an open, vendor-neutral format to enhance information exchange and e-commerce over the Internet. It is also a standard for the description and encoding of data.

XML Schema Description Language *n.* See XSDL.

XML stylesheet *n.* Contains formatting rules that are applied to an XML file referencing the stylesheet. The standard set of rules for XML stylesheets is the Extensible Stylesheet Language (XSL). See also XSL.

XML Web services *n.* Units of application logic providing data and services to other applications. Applications access XML Web services via standard Web protocols and data formats such as HTTP, XML, and SOAP, independent of how each XML Web service is implemented. XML Web services combine the best aspects of component-based development and the Web and are a cornerstone of the Microsoft .NET programming model.

Xmodem *n.* A file transfer protocol used in asynchronous communications that transfers information in blocks of 128 bytes.

Xmodem 1K *n.* A version of the Xmodem file transfer protocol designed for larger, longer-distance file transfers. Xmodem 1K transmits information in 1-kilobyte (1024-byte) blocks and uses a more reliable form of error checking. See also Xmodem.

Xmodem-CRC *n.* An enhanced version of the Xmodem file transfer protocol that incorporates a 2-byte cyclical redundancy check (CRC) to detect transmission errors. See also CRC.

XMS *n.* See extended memory specification.

XMT *n.* Short for transmit. A signal used in serial communications.

XNS *n.* Acronym for Xerox Network System. A set of protocols assigned to five numbered layers (0 through 4) that form a suite designed to handle packaging and delivery of network transmissions.

XON/XOFF *n.* An asynchronous communications protocol in which the receiving device or computer uses special characters to control the flow of data from the transmitting device or computer. When the receiving computer cannot continue to receive data, it transmits an XOFF control character that tells the sender to stop transmitting; when transmission can resume, the computer signals the sender with an XON character. Also called: software handshake. See also handshake.

XOR *n.* See exclusive OR.

XOR encryption *n.* Short for Exclusive-OR encryption. A simple encryption scheme using the "exclusive-or" concept, in which a decision is based on only one of two conditions being met. Using a provided key, XOR encryption performs an exclusive-or process on each byte of data to be encrypted. Because XOR encryption is not a strong security tool used alone, it is typically used as an additional level of security for Internet transmission of sensitive information.

XPath *n.* An XML language for addressing items in an XML document by specifying a path through the document structure. XPath is used by XPointer and XSLT to locate and identify XML document data. XPath is also considered a query language complement to XQuery. XPath is more supported than XQuery even though there is no approved standard yet for either. See also XPointer.

XPointer *n.* An XML language used to locate data within an XML document based on data property descriptions, such as attributes, location, and content. XPointer references the internal structure of a document, allowing links to be made to occurrences of a word, character set, content attribute, or other element, rather than to a specific point within the document. See also XPath.

XQuery *n.* Short for eXtensible Query Language. Designed to be a functional query language that is broadly applicable to a variety of XML data types derived from Quilt, XPath, and XQL. Both Ipedo and Software AG implement their own versions of the W3C's proposed specification for the XQuery language. Also called: XML Query, XQL.

XSD *n.* Acronym for eXtensible Schema Definition. A prefix used by convention to indicate a W3C schema namespace.

