
Dictionary of Computer and Internet Terms

Tenth Edition

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All inquiries should be addressed to:

Barron's Educational Series, Inc.

250 Wireless Boulevard

Hauppauge, NY 11788

www.barronseduc.com

ISBN-13: 978-0-7641-4105-8

ISBN-10: 0-7641-4105-8

Library of Congress Catalog Card No. 2008044365

Library of Congress Cataloging-in-Publication Data

Downing, Douglas.

Dictionary of computer and Internet terms / Douglas A. Downing,
Michael A. Covington, Melody Mauldin Covington. — 10th ed.

p. cm.

ISBN 978-0-7641-4105-8

1. Computers—Dictionaries. 2. Internet—Dictionaries. I. Covington,
Michael A., 1957– II. Covington, Melody Mauldin. III. Title.

QA76.15.D667 2009

004.03—dc22

2008044365

PRINTED IN CHINA

9 8 7 6 5 4 3 2 1

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TO THE READER

Computers are no longer just for specialists. Today, computing is not just a profession and a hobby; it is also a tool used in virtually all human activities.

That's why we've compiled this book of background knowledge. Its purpose is to tell you the things other people think you already know.

We design this book to have a convenient size so it can be easily carried around. In compiling a book this size, we have had to be selective. The quickest way to identify a word that you can't find in a book is probably to do a web search (*see* SEARCH ENGINE). Also, some terms are almost always abbreviated, and in that case you should look for the abbreviation rather than the full term.

Much has changed since the first edition of this book was published more than twenty years ago. New terms are being invented every day. We regularly update the book, and this edition contains new entries on a variety of topics including Windows Vista and Mac OS X. We've also cut out material that was showing its age.

Terms are marked *slang* or *humorous* if they are seldom used in serious writing. They are marked as *jargon* if, in our estimation, they are somewhat pretentious new names for old concepts and are not likely to endure. We provide occasional *Usage notes* to explain grammar, spelling, and proper use of words, such as the exact difference between *disc* and *disk*.

Throughout, we use SMALL CAPITALS to mark important words that are defined elsewhere in this book. By following cross-references, you can quickly find many entries that pertain to whatever interests you. Here are some entries you may wish to start with to learn about particular topics:

- Internet culture: CHAT ROOM
- right and wrong: COMPUTER ETHICS
- safe computing: COMPUTER SECURITY
- solving exceptionally difficult problems: ARTIFICIAL INTELLIGENCE
- productively using computers in business and daily life: APPLICATION PROGRAM
- listening to music: DIGITAL MUSIC
- taking pictures: DIGITAL CAMERA
- creating web pages: HTML
- writing computer programs: PROGRAMMING LANGUAGE
- software that controls a computer: OPERATING SYSTEM
- how a computer works: COMPUTER ARCHITECTURE
- networking and the Internet: INTERNET
- connecting computers wirelessly: WIRELESS COMMUNICATION
- electronic components: TRANSISTOR

Be sure to notice the visual dictionary of symbols at the end of the book. If you don't know what Σ or $\approx$ or $\bullet$ is called, don't worry; you can look it up there.

All four of us want to thank The University of Georgia and Seattle Pacific University for access to facilities and for accommodating us as we worked on the project. We also want to thank Robert Downing for help with 1960s data processing terminology; Sharon Covington for help with current Internet culture; and Brantley Coile of Coraid, Inc., for permission to adapt material from Coraid's glossary of networking and data storage.

Many of the words used in this book are registered trademarks. We have made no attempt to determine or report their legal status. For further information about any product name, consult the manufacturer's literature.

composite video the kind of video signal used in an analog TV set. The whole signal is transmitted on one wire. By contrast, an RGB signal has separate wires for red, green, and blue. *See* MONITOR.

compositing the combining of bitmap images from different sources or different objects in a single image. The opacity, or ALPHA, of each object determines how it combines with objects behind it. *See also* CHROMA-KEYING.

compression *see* DATA COMPRESSION.

CompuServe an online information service based in Columbus, Ohio, accessible by modem from anywhere in the United States. (*See* MODEM.) Since 1998, CompuServe has been a subsidiary of AOL. For further information, see www.compuserve.com.

computational linguistics the use of computers in the study of human language, and the study of how to make computers understand information expressed in human languages. *See* NATURAL LANGUAGE PROCESSING; PARSING.

computer a machine capable of executing instructions on data. The distinguishing feature of a computer is its ability to store its own instructions. This ability makes it possible for a computer to perform many operations without the need for a person to type in new instructions each time.

Computer a FOLDER on the DESKTOP of Microsoft Windows Vista that contains all the disk drives, the Control Panel, and other information about the system.

Ordinarily, folders are directories. The root directory of a disk drive is also a folder. “Computer” is a special folder that gives you access to the entire machine.

In previous versions of Windows, this folder was called “My Computer.”

computer architecture the design and internal structure of digital computers.

Fundamentally, a computer is a machine that can store instructions and execute them. Thus, it consists of two major parts, MEMORY and the central processing unit (CPU), which communicate through a set of parallel electrical connections called the BUS (Figure 64). The bus also connects to input-output devices such as a screen, a keyboard, and disk drives.

The CPU spends its time retrieving instructions from memory and doing whatever those instructions say. Each instruction is a pattern of bits (binary ones and zeroes, represented by electrical on and off signals). When the instruction reaches the CPU, the CPU must *decode* (recognize) it and activate the appropriate *functional unit* within the CPU in order to carry out the instruction. Functional units include adders, multipliers, circuits to compare bit patterns, etc., all of which are built from logic gates (for an example, *see* BINARY ADDITION).

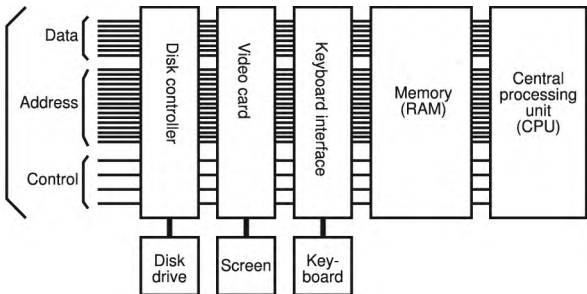


FIGURE 64. CPU communicates with memory and other devices via bus

The CPU contains REGISTERS to hold data that is being worked on. For example, in order to add two numbers, the CPU will typically retrieve the two numbers from memory into registers, perform the addition, place the result in another register, and finally store it back into memory. Figure 65 illustrates the parts of the CPU. In most present-day computers, the CPU is a single integrated circuit (IC) called a MICROPROCESSOR.

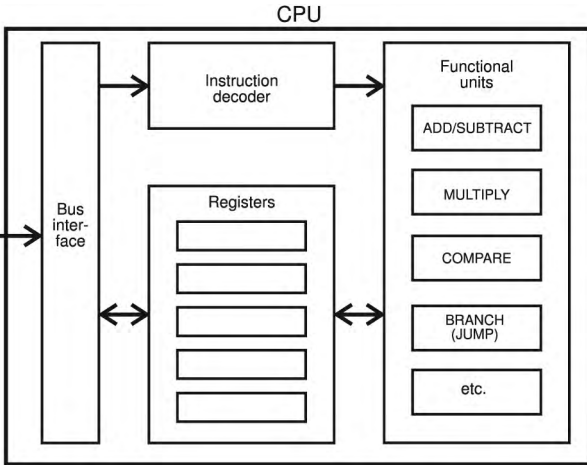


FIGURE 65. CPU (central processing unit) internal structure

Every location in memory has an ADDRESS (i.e., a bit pattern, binary number, that identifies the location). To retrieve the contents of memory location 011000011, the CPU places the bit pattern 011000011 on the

address portion of the bus, activates the “read memory” line, and waits a specified length of time. The memory places the contents of that location onto the data portion of the bus so that the CPU can read it. To put data into memory, the CPU puts both the address and the data onto the bus and activates the “write memory” line. Some computers also include “read port” and “write port” lines, which are like the lines used for accessing memory except that addresses are understood as applying to input and output devices (printer ports, etc.) rather than memory.

Most computers use a VON NEUMANN ARCHITECTURE, which means that programs and data are stored in the same kind of memory. Some microcontrollers use a HARVARD ARCHITECTURE, with separate memories for program and data (mainly because programs are kept permanently recorded in ROM, but data must be changeable).

Programmers normally do not write CPU instructions. Instead, they write programs in a high-level language such as BASIC, C, or Pascal, and use a COMPILER to translate the programs into machine language. It is also possible to write programs in ASSEMBLY LANGUAGE, which translates into machine language more directly.

computer ethics the responsible use of computers and computer networks. Malicious misuse of computers is rare, but serious misjudgments by well-meaning people are unfortunately common. Some important points to remember are the following:

1. *People have the same legal and ethical responsibilities when using a computer as at any other time.*

Slander, deception, harassment, and the like are just as wrong when done via computer as when done any other way, and they incur the same legal penalties.

Using a computer without the owner’s permission is prosecutable as theft of services (just like using any other machine without the owner’s permission). Damaging property or data by releasing a computer virus is also prosecutable as a crime.

2. *Computers will not necessarily prevent all improper acts; users are responsible for what they do.* For example, if a computer is set up incorrectly so that it lets unauthorized people use it without a password, that does not justify the unauthorized usage, just as a defective door lock does not justify burglary.
3. *Some of the information stored in computers is private and confidential and should not be abused.* This applies particularly to credit records, educational records, and the like. Such information may also be incomplete or inaccurate because people did not correct errors that they considered inconsequential. If the information is later used for a completely different purpose, the errors can be damaging.
4. *Electronic communications are not guaranteed to be private.* You do not know what path your electronic mail follows or who may see it en route. Do not send credit card numbers or other confidential information through e-mail unless you have confirmed that it is traveling by a secure path.

D

DAC, D/A converter *see* DIGITAL-TO-ANALOG CONVERTER.

daemon (under UNIX) a program that runs continuously in the background, or is activated by a particular event. The word *daemon* is Greek for “spirit” or “soul.”

dagger the character †, sometimes used to mark footnotes. *See also* FOOTNOTE. Also called an OBELISK or LONG CROSS.

daisy-chain to connect devices together in sequence with cables. For example, if four devices A, B, C, and D are daisy-chained, there will be a cable from A to B, a cable from B to C, and a cable from C to D.

daisywheel printer a printer that uses a rotating plastic wheel as a type element. Daisywheel printers were often used with microcomputers in the early 1980s. They printed high-quality text, but they were relatively slow and could not print graphics.

DAS *see* DIRECT(LY) ATTACHED STORAGE.

dash (—) a punctuation mark similar to a hyphen, but longer. On a typewriter, a dash is typed as two hyphens.

Proportional-pitch type often includes one or more kinds of dashes, such as an em dash (—), which is as wide as the height of the font, and an en dash (—), which is two-thirds as wide as the em dash. Normally, the em dash joins sentences and the en dash joins numbers (as in “1995–98”).

data information. The word was originally the plural of *datum*, which means “a single fact,” but it is now used as a collective singular.

data bits a parameter of RS-232 serial communication. Either 7 or 8 bits are used for each character, preceded by a *start bit* and followed by a *parity bit* (optional) and a *stop bit*. *See also* RS-232; KERMIT.

data communication the transfer of information from one computer to another. In order for communication to take place, several aspects of the communication process must be standardized. The international OSI (Open Systems Interconnection) standard (ISO Standard 7498) defines seven layers at which decisions have to be made:

1. *Physical layer.* What kind of electrical signals are sent from machine to machine? For examples of standards on this level, *see* 10BASE-T; RS-232; MODEM.
2. *Link layer.* How do the two machines coordinate the physical sending and receiving of signals? For examples, *see* HANDSHAKING; PACKET.
3. *Network layer.* How does one machine establish a connection with the other? This covers such things as telephone dialing and the

LinkedIn a social networking site (www.linkedin.com) designed for business professionals to use for work contacts and communication.

linker a program that puts separately compiled routines together to make a complete, working program. *See* LINK (definition 5).

Linspire a commercial distribution of Linux, based on Debian and later Ubuntu, that was marketed by Linspire, Inc. (www.linspire.com). In 2008, the company's name changed to Digital Cornerstone. *See* DEBIAN; LINUX; UBUNTU.

Linux (usually understood as “**Linus’ UNIX**”) a freely distributed UNIX-compatible operating system for PCs and a number of other processors.

Linux was developed by Linus Torvalds and others and is distributed under terms similar to those of Gnu’s “copyleft” (*see* GNU). Copies can be given away free provided they are complete and intact, but most users prefer to purchase commercially produced CD-ROMs containing Linux together with application software.

Linux is quite reliable and highly compatible with UNIX; as a result, it is very popular with universities, Internet service providers, and small businesses that need multi-user computing at minimum cost. More information can be found on the World Wide Web at www.linux.org. *See also* DEBIAN; LINSPIRE; RED HAT; UBUNTU.

Linux box (*slang*) a small computer running Linux.

Lion common misspelling of LI-ION.

liquid crystal display *see* LCD.

Lisp (List Processor) a programming language developed in the late 1950s at MIT under the direction of John McCarthy. Because of the ease with which it can handle complex data structures, Lisp is used for artificial intelligence research and for writing programs whose complexity would render them unmanageable in other languages.

A Lisp program is easy to recognize because of the accumulation of closing parentheses at the end of the program. All Lisp statements and most Lisp data structures are linked lists, written as lists of elements in parentheses (*see* LINKED LIST). Programmers build a complete program by defining their own statements (actually functions) in terms of those previously defined. For example, a function that computes the factorial of X is:

```
(DEFUN FACTORIAL (X)
  (IF (= X0)
    1
    (* FACTORIAL(-X 1))))
```

Translating into English: “This is the definition of a function called FACTORIAL whose parameter is X . If X is zero, its factorial is 1; otherwise, its factorial is equal to X times the factorial of $X - 1$.” The IF keyword works like a Pascal if-then-else statement. This function calls itself recursively; recursion is a normal way of expressing repetition in Lisp.

stepdown transformers and voltage regulators. *See also* SWITCHING POWER SUPPLY.

The watt and ampere ratings of a power supply represent the maximum that it can deliver; the actual power consumed will depend on the devices attached to it. Correct practice is to use a power supply with the *correct* voltages and *correct or higher* watt and ampere ratings.

PowerPC a family of high-performance 32- and 64-bit microprocessors developed jointly by IBM, Motorola, and Apple to compete with the Intel microprocessors and Microsoft software that were dominating the market. From 1994 to 2006, PowerPC CPUs were used in the Apple Macintosh. Despite the name, the PowerPC microprocessor has never been used in Windows-based PCs.

PowerPoint presentation software sold with Microsoft's Office suite. The user can create an outline version of a talk and then display it one page at a time or one line at a time, and graphics can be included as well. Speaker notes or handouts can also be printed. *See* PRESENTATION GRAPHICS.

PowerToys a set of small Windows utilities distributed free of charge by Microsoft to allow additional customization of the operating system.

PPM (pages **per** minute) a measure of the speed of a printer.

PPP (Point-to-Point Protocol) a communications protocol often used in DIAL-UP NETWORKING. *Compare* SLIP. *See* PROTOCOL.

PPPoE (Point to Point Protocol **over** Ethernet) a protocol allowing the use of PPP (as would be used in dial-up networking) when the user is connected to the network through an Ethernet port (as would be the case for a user connected to the Internet via a cable modem).

precedence the property of arithmetic operations that determines which operations are done first in a complex expression.

Typically, exponentiations are done first, then multiplications and divisions, and finally additions and subtractions. For example, the Excel expression

$$=5+4*3^2$$

means $5 + 4 \times 9 = 5 + 36 = 41$. You can use parentheses to change the order of the operations when you need to, since any operation in parentheses will be done first. For example,

$$=5+(4*3)^2$$

means $5 + 12^2 = 5 + 144 = 149$.

precision the exactness with which a quantity is specified. For numbers, the precision is the number of significant digits that the computer keeps track of when it carries out arithmetic operations. *See* ROUNDING ERROR. For examples in Java, *see* DOUBLE PRECISION; LONG.

series connection of two electronic components so that current flows through one and then the other (see Figure 236). *Contrast* PARALLEL.



FIGURE 236. Series circuit (two resistors)

serif the short finishing strokes of the letterforms in a roman typeface, present in I F A and absent in IFA (Figure 237). It is thought that the horizontal nature of serifs helps guide the reader's eye along the line of type. *Contrast* SANS-SERIF. *See also* TYPEFACE.



FIGURE 237. Serif (highlighted on two letters)

server a computer that provides services to another computer (called the *client*). On multitasking machines, a process that provides services to another process is sometimes called a server. For specific examples, see FILE SERVER; WEB SERVER; X SERVER.

server-side application a computer program that runs on a network server rather than on the client PC. For instance, Java servlets are server-side applications; when you view a web page that contains a servlet, the computation is done on the server rather than on your PC. *Contrast* CLIENT-SIDE APPLICATION.

service in Windows, a program that runs continuously, unseen by the user, such as a Web or FTP server, or a program with a more mundane function such as updating the system clock; the equivalent of a UNIX DAEMON.

service bureau a business that provides services to computer users, such as high-quality color printing, disk format conversions, or the like.

service pack a set of updates to a software package, delivered together or even delivered with the original software.

Usage note: The phrase *Windows XP Service Pack 2* can mean either “Service Pack 2 for Windows XP” or “Windows XP with Service Pack 2 included.”

service provider a company that provides computer or networking services to customers. *See also* ACCESS PROVIDER; INTERNET.

servlet a Java program that runs on a web server. By contrast, an applet is a Java program running on a web browser client.

VoIP (Voice over Internet Protocol) the transmission of voice telephone conversations through the Internet or through IP networks. Several protocols are used for this purpose. *See* INTERNET TELEPHONY; PROTOCOL; SKYPE.

voken (virtual token) an advertisement that appears over the contents of a browser window, but not in a window of its own. *Compare* POP-UP AD.

The voken can move around the screen, rotate, and blink to attract attention. A moving voken can trick you into clicking on it—thus going to the advertiser's site—when you meant to click on something else, but it got in the way.

volatile not permanent; erased when turned off. The memory (RAM) of a computer is volatile; that is, it goes blank when power is removed. Flash memory and disks are non-volatile. In some programming languages, a variable is declared *volatile* if it can be changed by something outside the program.

volt the unit of measure of electric potential. If a potential of 1 volt is applied to a resistance of 1 ohm, then a current of 1 ampere will flow through the resistance. (*See* OHM'S LAW.)

volume

1. an individual diskette, disk, or tape.
2. the perceived loudness of a sound. The volume control on a sound card may be a knob on the card itself, a setting made in software, or both.

volume serial number an identifying number assigned to a disk or tape by Windows or other operating systems. Volume serial numbers ensure that the computer will know when the disk or tape in a drive is changed.

Von Neumann architecture a type of computer design in which programs and data are stored in a single kind of memory. *Contrast* HARVARD ARCHITECTURE. *See* COMPUTER ARCHITECTURE.

Von Neumann, John (1903–1957) mathematician who worked on one of the earliest computers and developed the concept of storing programs in memory.

voxel (from *volume cell*) one of the cubes into which a three-dimensional space is divided, like a PIXEL but in three dimensions.

VPN (virtual private network) a network where data is transferred over the Internet using security features preventing unauthorized access.

VRAM (video random access memory) RAM that is specially designed for use in video cards. Commonly, it can be read and written simultaneously so that the generation of the display is not interrupted when the CPU needs to place data in it.

VRML (Virtual Reality Markup Language or Virtual Reality Modeling Language) a programming language developed by Mark Pesce and Tony Parisi to describe three-dimensional objects for graphical display. A