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COMPUTER DICTIONARY



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INTRODUCTION

The *Microsoft Press Computer Dictionary* is designed to be a comprehensive and authoritative source of definitions for computer-related terms and acronyms. Written and reviewed by a distinguished team of experts from the computer industry and the business and academic communities, the dictionary includes terms drawn from a wide variety of disciplines:

Applications	History
Communications	Information Processing
Data and Data Storage	General Computing
Databases	Input/Output
Desktop Publishing	Memory and Memory Management
Electronics	Networks
Hardware	Output
Chips, Cards, and Boards	Print
Computers	Screen
Disks, Drives, and Other Media	Programming
Keyboards	Systems and Environments
Printers and Plotters	
Video	
Other Devices	

Although the book covers nearly every aspect of computing, it does not include entries on specific companies or on specific makes and models of computers, nor does it contain entries on most application software products, although some key products of universal importance are covered.

Order of Presentation

Entries are alphabetized letter by letter. Spaces are ignored, as are characters such as hyphens and slashes; for example, *Baudot code* falls between *baud* and *baud rate*, and *machine-independent* falls between *machine identification* and *machine instruction*. Numbers and symbols are located at the beginning of the book and are listed in ascending ASCII order. If an entry begins with a letter or letters but contains a number, it is listed alphabetically, according to the initial letter(s), and then according to ASCII order. Thus, *V20* precedes *V.2x*, and both precede *VAB*.

Format

Information in each entry is presented in a consistent format: entry name, abbreviation, pronunciation (if supplied), alternative name or names, definition, and cross-references (if any).

Phonetic pronunciations are given where appropriate or in cases where pronunciation might not be apparent. If an acronym is pronounced simply by saying the successive letters it contains, no pronunciation is given.

Cross-references are of three kinds: A *See* reference simply points to another entry that contains the information sought; a *See also* reference points to one or more entries that contain additional or supplemental information about the topic; and a *Compare* reference points to an entry or entries that offer contrast.

Illustrations are called out in the text. In most cases, illustrations appear on the same page as the entries to which they apply. In some instances, however, page-layout requirements have forced them to a subsequent page. In any event, the caption of each illustration identifies the entry to which it belongs.

Future Printings and Editions

Every effort has been made to ensure the accuracy and completeness of this book. If you find an error, think that an entry does not contain enough information, or seek an entry that does not appear in this edition, please let us know. Address your letter to: Microsoft Press, One Microsoft Way, Redmond, WA 98052, *Attention: Dictionary Editor*.



In some graphics-based applications, a special type of mouse pointer.

graceful exit The termination of a process that allows the operating system or parent process to regain normal control. A program that shuts itself down methodically and leaves the system in a state of equilibrium is said to make a graceful exit. This is expected behavior. *See also* fail-soft system.

grade In communications, the range of frequencies available for transmission on a single channel. Voice-grade telephone, for example, covers frequencies ranging from about 300 hertz (Hz) through 3400 Hz.

grade of service The traffic-handling ability of a shared communications network, such as the public telephone system. Grade of service is the reciprocal of a decimal value representing the probability that a user will receive an "all channels busy" signal. A grade of service of 0.002, for example, assumes that a connection can be made for 99.8 percent of all calls under normal conditions.

grafPort On the Apple Macintosh, a graphics environment such as a window with its own pen size, font, background pattern, and so on. Programmers can also create grafPorts for sending graphics to an off-screen window or to a printer.

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

grandfather *See* generation.

grandfather/father/son *See* generation.

grandparent *See* generation.

granularity A reference to the size of the standard meaningful unit with respect to a particular mode of operation. Granularity in reference to computer processes is analogous to granularity in measuring sugar, salt, or rocks: The larger the pieces, the coarser the granularity. The term is used in describing such topics as screen resolution, criteria used to search and sort a database, levels of manipulation applied to data, and amount of time given by the microprocessor to a particular operation, such as background printing.

graph In programming, a data structure consisting

of zero or more nodes linked together in an arbitrary fashion. Any two nodes in a graph may (or may not) be connected by an edge. Not all the nodes in a graph need to be connected, but if a path can be traced between any two nodes, the graph is a connected one. A subgraph is any subset of the nodes and edges within the graph. There are many types of graphs, including weighted graphs (in which each edge has a given weight or value) and directed graphs, or digraphs (in which each edge has a direction—that is, the edge connects node A to node B but not node B to node A). *See also* node, tree.

graphical interface *See* graphical user interface.

Graphical Kernel System Abbreviated GKS. An internationally accepted standard for computer graphics recognized by the American National Standards Institute (ANSI) and the International Organization for Standardization (ISO). GKS is an interface that provides programmers with standardized methods of describing, manipulating, storing, and transferring graphical images. GKS functions at the application (rather than hardware) level and deals with logical workstations—combinations of input and output devices (such as keyboard, mouse, and monitor)—rather than with individual devices. As a result, graphics can be input and output with various devices and can be transferred with little difficulty. GKS was developed in 1978, originally to handle two-dimensional graphics; a later modification, GKS-3D, extended the standard to three-dimensional graphics. *See also* ANSI, ISO.

graphical user interface Abbreviated GUI (pronounced "gooey"). A type of display format that enables the user to choose commands, start programs, and see lists of files and other options by pointing to pictorial representations (icons) and lists of menu items on the screen. Choices can generally be activated either with the keyboard or with a mouse. Graphical user interfaces are used on the Apple Macintosh and by such programs as Microsoft Windows and the OS/2 Presentation Manager.

For application developers, GUIs offer an environment that takes care of the direct interaction with the computer. This frees the developer to con-



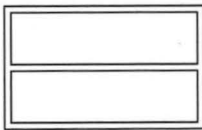
centrate on the application without getting bogged down in the details of screen display or mouse and keyboard input. It also enables programmers to create programs that always handle frequently performed tasks, such as saving a data file, in the same way because the interface provides standard controlling mechanisms such as windows and dialog boxes. Another benefit is that applications written for a GUI are device-independent: As the interface changes to support new input and output devices, such as a large-screen monitor or an optical storage device, the applications can, without modification, use those devices.

graphic character Any character that is represented by a visible symbol—for example, any ASCII character. A graphic character is not the same as a graphics character. *Compare* graphics character.

graphic limits On a computer screen, the boundary of a graphical image in a graphics software program, including all the area enclosed within the graphic. In some graphics environments, the limits of a graphic (the smallest rectangle that can completely enclose it) are often called its bounding rectangle or bounding box.

graphics adapter A video adapter capable of displaying graphics as well as alphanumeric data. Almost all video adapters in common use today are graphics adapters; the major exception is the IBM MDA (Monochrome Display Adapter).

graphics character A character that can be combined with others to create simple graphics, such as boxes:



and shaded or solid blocks:



The characters shown above are from the IBM extended character set. *Compare* graphic character.

Graphics Controller The part of the IBM EGA and

VGA video adapters that allows the computer access to the video buffer.

graphics coprocessor A specialized microprocessor, mounted on some video adapters, that can generate graphical images such as lines and filled areas in response to instructions from the computer, freeing the computer for other work.

graphics data structure A data structure that is designed specifically for representing one or more elements of a graphical image.

graphics interface *See* graphical user interface.

graphics mode On computers such as the IBM PC, the display mode in which lines and characters on the screen are drawn pixel by pixel. Because graphics mode creates images from individual dots on the screen, programs have more flexibility in creating images than they do in the opposite display mode, text (or character) mode. Thus, the computer is able to display a mouse pointer as an arrowhead or other shape rather than as a blinking square or rectangle, and it can display character attributes, such as boldface and italics, as they will appear in print rather than using conventions such as highlighting, underlining, or alternate colors. *Compare* text mode.

In relation to video hardware, graphics mode can also refer to the resolution of the image together with the number of colors a particular video system can display. For example, on the IBM PC, a Color/Graphics Adapter can display 4 colors at a resolution of 320 by 200 pixels, and an Enhanced Graphics Adapter can display 16 colors at a resolution of 640 by 350 pixels. Both of these (and other combinations of colors and resolutions displayed by these and other adapters) are considered different graphics modes. *See also* high resolution, low resolution, resolution.

graphics port *See* grafPort.

graphics primitive In computer graphics, a drawing element, such as a text character, an arc, or a polyline (a set of points connected by straight lines), that is combined with other primitives to create an image. A graphics primitive is drawn and manipulated as a single unit. In CAD programs, dots, lines, arcs, text, and similar simple structures are commonly called *entities*. Depending on the



perform adequately with other products that are expected to become widely used in the foreseeable future. The use of standards and conventions makes upward compatibility easier to achieve.

usability The ease and adaptability with which a product can be applied to the performance of the work for which it is designed. A high degree of usability implies ease of learning, flexibility, freedom from bugs, and good design that does not involve unnecessarily complicated procedures.

USENET A worldwide network of UNIX systems, with decentralized administration, used for electronic mail and transmission by special-interest discussion groups. It was originally implemented using UUCP (UNIX-to-UNIX Copy) software and telephone connections; that method of communication remains important, although more modern methods are also used. *See also* UUCP.

user-defined data type A data type defined in a program. User-defined data types are usually combinations of data types defined by the programming language being used and are often used to create data structures. *See also* data structure, data type.

user-defined function key *See* keyboard enhancer, programmable function key.

user-friendly An adjective meaning easy to learn and easy to use.

user group A group of people drawn together by interest in the same computer system or software. User groups, some of which are large and influential organizations, provide support for newcomers and a forum where members can exchange ideas and information.

user interface The portion of a program with which a user interacts. If the user enters commands at the keyboard and the program responds by operating in a specific manner, the program has a command-line interface. If commands to the program are typically given via menu selections, the program is said to have a menu-driven interface. Programs that graphically display information and require a pointing device for user interaction have graphical user interfaces.

User Interface Toolbox *See* Toolbox.

user name The name by which a person is known and addressed on a communications network. *See also* alias.

user profile A computer-based record maintained about an authorized user of a multiuser computer system. A user profile is needed for security and other reasons; it can contain such information as the person's access restrictions, mailbox location, type of terminal, and so on.

user state The least privileged of the modes in which a Motorola 680x0 microprocessor can operate. This is the mode in which application programs are run. *Compare* supervisor state.

USRT Acronym for universal synchronous receiver-transmitter. A module, usually composed of a single integrated circuit, that contains both the receiving and transmitting circuits required for synchronous serial communication. Synchronous serial communication differs from asynchronous communication in that the operations of the sending and receiving units are synchronized by a common clock line. Because of this synchrony, the receiving unit "knows" when the sending unit starts and stops a data packet; thus, start and stop information need not be encoded in the data stream. Synchronous communication requires two communication channels between sender and receiver. *Compare* UART.

utility A program, such as an editor or a debugger, designed to perform a particular function. The term *utility* usually refers to software that solves narrowly focused problems or those related to computer system management. *See also* application.

utility program A program designed to perform maintenance work on the system or on system components—for example, a storage backup program, a disk and file recovery program, or a resource editor.

UUCP Acronym for UNIX-to-UNIX Copy. A set of software programs that facilitate transmission of information between UNIX systems using serial data connections, primarily the public switched telephone network.

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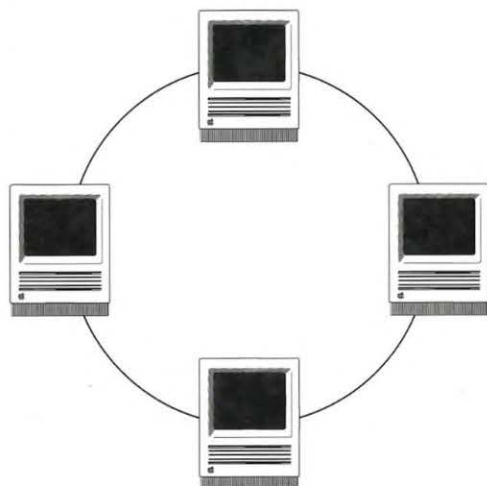
The Standard Microcomputer Dictionary for Business, School, Library, and Home

Here at last is a rich and comprehensive dictionary that meets the information needs of today's microcomputer user. This dictionary is ideal for the hundreds of thousands of people who work with microcomputers but who are not computer professionals. Wide-ranging in scope, it covers:

- memory management ■ applications ■ hardware ■ graphics ■ system software
- desktop publishing ■ programming ■ printing ■ electronics ■ communications
- computer-industry slang ■ data storage ■ networks

The MICROSOFT PRESS COMPUTER DICTIONARY was written, reviewed, and edited by a distinguished team of experts whose experience is drawn from the computer industry and the business and academic communities.

ring network A local area network in which devices (nodes) are connected in a closed loop, or ring. Messages in a ring network pass in one direction, from node to node. As a message travels around the ring, each node examines the destination address attached to the message. If the address is the same as the address assigned to the node, the node accepts the message; otherwise, it regenerates the signal and passes the message along to the next node in the circle. Such regeneration allows a ring network to cover larger distances than star and bus networks. It can also be designed to bypass any malfunctioning or failed node. Because of the closed loop, however, new nodes can be difficult to add. A ring network is diagrammed below:



Compare bus network, star network; see also token passing, token ring network.

Pronunciation Guides. Where appropriate, definitions include phonetic pronunciations that reflect industry usage—for example: GUI, pronounced “gooey.”

Definitions Plus. Each of the more than 5000 entries is written in clear, standard English, and most go beyond simple definition to provide additional detail. You'll find definitions for terms as basic to computing as *hard disk*, *boot*, *operating system*, and *batch file* as well as more advanced terms such as *object-oriented programming*, *fractal*, *expert system*, and *virtual memory*.

Illustrations. Drawings, diagrams, and other graphics enhance many definitions.

Cross-References. Entries are fully cross-referenced to provide supplementary information and invite further exploration.

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