

Exhibit 7

Dictionary of Computer and Internet Terms

Eleventh Edition

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The range of numbers that can be represented is different than before. Without the sign bit, 4 binary digits can hold numbers from 0 to 15; with the sign bit, the numbers range from -8 to 7. The table shows how.

Positive Numbers		Negative Numbers	
Decimal	Binary	Decimal	Binary
0	0000		
1	0001	-1	1111
2	0010	-2	1110
3	0011	-3	1101
4	0100	-4	1100
5	0101	-5	1011
6	0110	-6	1010
7	0111	-7	1001
		-8	1000

On real computers it is typical to use 16 bits (2 bytes) to store integer values. Since one of these bits is the sign bit, this means that the largest positive integer that can be represented is $2^{15} - 1 = 32,767$, and the most negative number that can be represented is $-(2^{15}) = -32,768$. Some programming languages also provide an "unsigned integer" data type that ranges from 0 to 65,535.

bind to associate symbols with data, or to associate one piece of data with another, in several different ways, among them.

1. to give a variable a value.
2. to allocate a specific address in memory to a variable or to the entry point of a procedure.
3. to associate a network protocol with a particular Ethernet port or the like. See PROTOCOL.
4. to map an XML document onto a set of variables or objects in Java or another programming language.
5. to put together the pages of a book.

binding see BIND (all definitions).

Bing search engine from Microsoft (web address: www.bing.com)

biometrics measurable physical characteristics of the human body, used to identify an individual for security purposes. They include fingerprints, the distinctive appearance of faces and eyes, and the distinctive sound quality of one's voice. There are computer input devices to read these characteristics.

BIOS (Basic Input Output System) a set of procedures stored on a ROM chip inside PC-compatible computers. These routines handle all input-output functions, including screen graphics, so that programs do not have to manipulate the hardware directly. This is important because if the hardware is changed (e.g., by installing a newer kind of video

BIOS enumerator

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adapter), the BIOS can be changed to match it, and there is no need to change the application programs.

The BIOS is not re-entrant and is therefore not easily usable by multitasking programs. Windows programs do not call the BIOS; instead, they use procedures provided by the operating system.

BIOS enumerator the BIOS routine that tells a PLUG AND PLAY system what hardware is installed.

bipolar transistor a semiconductor device formed by sandwiching a thin layer of P- or N-type semiconductor between two layers of the opposite type of semiconductor. (See TRANSISTOR.) The other general type of transistor is the field-effect transistor (FET).

bis Latin for "a second time," used to denote revised CCITT and ITU-T standards. See CCITT; ITU-T.

BIST (built-in self test) a feature included in newer integrated circuits and other electronic equipment. An electronic device that has BIST can test itself thoroughly whenever it is turned on. See INTEGRATED CIRCUIT.

bit a shorthand term for *binary digit*. There are only two possible binary digits: 0 and 1. (See BINARY NUMBER.) A computer memory is a collection of devices that can store bits.

A *byte* is the number of bits (usually 8) that stand for one character. Memory is usually measured in units of *megabytes*. See MEMORY; METRIC PREFIXES.

One important measure of the capability of a microprocessor is the number of bits that each internal register can contain. For example, the classic Z80 microprocessor had 8-bit registers. The Intel 8088, used in the original IBM PC, had 16-bit registers but only an 8-bit bus, leading to some confusion as to whether it should really have been called a 16-bit processor. Newer microprocessors have 32 or 64 bits per register. In general, a processor with a greater number of bits per instruction can process data more quickly (although there are other factors to consider that also determine a computer's speed). See also MICROPROCESSOR.

The number of colors that can be displayed is sometimes given by listing the number of bits used to represent a color. For example, a 24-bit color system uses 8 bits for red, 8 for green, and 8 for blue, so it can display $2^8 = 256$ different levels of each of the three primary colors, or $2^{24} = 16,777,216$ different mixtures of colors. See COLOR.

The term bit is also used to indicate the quality of digitized sound, as in 8 bit or 16 bit. See SAMPLING RATE.

bit bucket (slang) a place where data is lost. For example, under UNIX, the filename `/dev/null` can be used as a bit bucket; anything written to it will be ignored, but the program will think it is successfully writing to a file.

bit depth in graphics, the number of bits that are used to record the inten-

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