

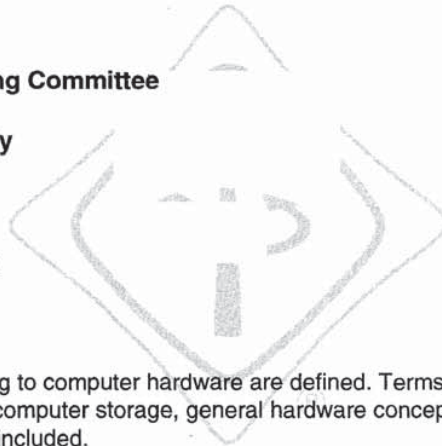
# IEEE Standard Glossary of Computer Hardware Terminology

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**Standards Coordinating Committee  
of the  
IEEE Computer Society**

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**Abstract:** Terms pertaining to computer hardware are defined. Terms falling under the categories of computer architecture, computer storage, general hardware concepts, peripherals, and processors and components are included.

**Keywords:** computer, hardware, definition, glossary, terminology

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## Introduction

(This introduction is not a part of IEEE Std 610.10-1994, IEEE Standard Glossary of Computer Hardware Terminology.)

As the computer field continues to expand, new terms are being generated and new meanings are being adopted for existing terms. The IEEE Computer Dictionary project (the 610 computer glossary series of documents) was undertaken to document this vocabulary. Its purpose is to identify terms currently in use in the computer field and to establish standard definitions for these terms. The dictionary is intended to serve as a useful reference for those in the computer field and for those who come into contact with computers, either through their work or in their everyday lives.

The completed dictionary will contain terms from each of the following areas: Computer Hardware, Software Engineering, Mathematics of Computing, Theory of Computation, Computer Applications, Artificial Intelligence, Data Management, Image Processing and Pattern Recognition, Modeling and Simulation, Computer Graphics, Computer Networking, Computer Languages, and Computer Security and Privacy. This glossary contains the terms related to Computer Hardware.

Every effort has been made to use definitions from established standards in this dictionary. When existing standards were found to be incomplete, unclear, or inconsistent with other entries in the dictionary, however, new, revised, or composite definitions have been developed.

At the time this glossary was approved, the following people formed the steering committee of the Computer Dictionary working group:

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# IEEE Standard Glossary of Computer Hardware Terminology

## 1. Overview

### 1.1 Scope

This glossary defines terms pertaining to computer hardware. It includes terms from the following areas:

- Computer storage
  - Storage media (nonspecific)
  - Storage media—card form
  - Storage media—optical
  - Storage media—paper form
  - Storage media—magnetic
  - Types of storage
  - General storage concepts
  - Storage functions
  - General memory concepts
  - Characters, words, bytes, and bits
  - Storage devices
  - Recording techniques
  - Virtual storage concepts
- Processors and components
  - General circuit concepts
  - Integrated circuits
  - Circuits elements
  - Types of circuits
  - Components—bus
  - Components—channels
  - Components—circuit boards
  - Components—registers
  - Components—processors
  - Components—uncategorized
  - Logic elements and concepts
  - Logic—operations
  - Mathematic elements
  - Timers, rates, clocks, and counters
- Peripherals
  - Display devices
  - Input devices
  - Keyboards and keys
  - Printers and plotters
  - Tape devices
  - Card readers
  - Fonts
- Computer architecture
  - Types of computers/machines
  - Types of systems/networks/environments
  - Computer architecture—types
  - Computer architecture—general
  - Instructions and addressing
  - Engines
  - Computer performance
  - Construction and packaging
- General hardware concepts
  - Analog computer concepts
  - Things that hardware can do
  - General terms—applications
  - General terms—electrical
  - Hardware errors
  - Languages
  - Hardware signalling
  - Standards and standard organizations

Some terms are the names of commercial products. Many times such products are developed by a particular group, then the product name is accepted as a generic description of all products performing similar functions. For this reason, this glossary does not, in most cases, attempt to identify the owner or developer of a product. The reader should exercise caution in drawing inferences concerning ownership, trademarks, and copyright of names.

Some technical terms that appear in the definitions are defined in other glossaries in the 610 series and are not included as entries here. For example, IEEE Std 610.12-1990, IEEE Glossary of Software Engineering Terminology, defines terms relating to computer programs, while IEEE Std 610.5-1990, IEEE Standard Glossary of Data Management Terminology, defines terminology relating to data management.

## 1.2 Glossary Structure

Entries in the glossary are arranged alphabetically. An entry may consist of a single word, such as “hardwired” or “processor,” or a phrase, such as “print head.” Phrases are given in their natural order, as in “printed circuit board,” rather than in reversed order, “circuit board, printed.”

Blanks and numerals precede all other characters in alphabetizing. Hyphens and slashes are treated as blanks.

The following distinction is made between acronyms and abbreviations: An acronym is a combination of the first one (or few) letters from two or more words in the term, put together to make a single term. An acronym does not have to be pronounceable. Generally, acronyms are capitalized. An abbreviation is a shortened version of a single word or anything that is not an acronym.

If a term has more than one definition, the definitions are numbered. The order of the definitions does not imply preference or frequency of use. In most cases, noun definitions are given first, followed by verb and adjective definitions as applicable. Examples and notes have been added to clarify selected definitions.

The following cross-references are used to show a term’s relationship to other terms in the glossary:

- *Contrast with:* refers to a term with an opposite or substantially different meaning.
- *Syn:* refers to a synonymous term.
- *See also:* refers to a related term.
- *See:* refers to a preferred term or to a term where the desired definition can be found.

The word “deprecated” indicates a term or definition whose use is discouraged because such use is obsolete, misleading, or ambiguous.

## 2. References

In those cases in which a definition is directly quoted from an existing dictionary or glossary, the following references apply:

ANSI X3.138-1988, Information Systems—Information Resource Dictionary System (IRDS).<sup>1</sup>

IEEE Std 1084-1986 (W1993), IEEE Standard Glossary of Mathematics of Computing Terminology.<sup>2</sup>

IEEE Std 610.2-1987, IEEE Standard Glossary of Computer Applications Terminology (ANSI).<sup>3</sup>

IEEE Std 610.3-1989, IEEE Standard Glossary of Modeling and Simulation Terminology (ANSI).

IEEE Std 610.4-1990, IEEE Standard Glossary of Image Processing and Pattern Recognition Terminology (ANSI).

IEEE Std 610.5-1990, IEEE Standard Glossary of Data Management Terminology (ANSI).

IEEE Std 610.6-1991, IEEE Standard Glossary of Computer Graphics Terminology (ANSI).

IEEE Std 610.7-1995, IEEE Standard Glossary of Computer Networking (ANSI).

IEEE Std 610.12-1990, IEEE Standard Glossary of Software Engineering Terminology (ANSI).

IEEE Std 610.13-1993, IEEE Standard Glossary of Computer Languages (ANSI).

NOTE—Numbers in brackets that follow a definition refer to the source document for the definition. A lowercase “a” after the number indicates that an editorial change was made in the definition for inclusion in this document.

<sup>1</sup>ANSI publications are available from the Sales Department, American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036, USA.

<sup>2</sup>IEEE Std 1084-1986 has been withdrawn; however, copies can be obtained from the IEEE Standards Department, IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, USA.

<sup>3</sup>IEEE publications are available from the Institute of Electrical and Electronics Engineers, Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, USA.

**3.236 bus.** One or more conductors that are used for the transmission of signals, data, or power. *See also:* address bus; bidirectional bus; control bus; data bus; data chain bus; memory bus; time-multiplexed bus.

**3.237 bus-based architecture.** A computer architecture in which the components such as processors, peripheral devices and memory are interconnected by one or more busses. *Contrast with:* non-bus architecture.

**3.238 bus driver.** (1) A device capable of providing sufficient current to drive all loads connected to a bus. *See also:* bus slave. (2) A device which controls access to a bus.

**3.239 bus master.** A device connected to a bus which controls all other devices connected to the same bus. *Note:* The bus master controls which slave devices may, and when they may, place data on the bus. *Contrast with:* bus slave.

**3.240 bus mouse.** A mouse that connects to the computer system using a bus, generally contained within a special expansion board. *Contrast with:* serial mouse.

**3.241 bus slave.** (1) A device which responds to signals on a bus. *Contrast with:* bus master. (2) A device connected to a bus which cannot put data onto the bus until given permission by the bus driver or bus master.

**3.242 button device.** *See:* choice device. [IEEE Std 610.6-1991]

**3.243 byte.** (1) A group of adjacent binary digits operated upon as a unit and is usually shorter than a computer word. *Note:* Although most people refer to a byte as having 8 bits used for data representation, hardware designers may add one or more parity bits to be used for error detection and correction. *See also:* doublet; gigabyte; gulp; kilobyte; megabyte; nibble; n-bit byte; octet; quintet; quartet; septet; sextet; triplet. [IEEE Std 610.12-1990a] (2) An element of computer storage that can hold a group of bits as in (1). *See also:* bit; word. [IEEE Std 610.12-1990]

**3.244 cache.** A small portion of high-speed memory used for temporary storage of frequently-used data, instructions, or operands. *See also:* cache architecture; cache memory; caching; data cache; disk cache; high-speed buffer; instruction cache.

**3.245 cache architecture.** (1) A computer architecture that employs an extremely high-speed memory block, called a cache, in which data is stored. (2) The organiza-

tion of cache memory; for example, direct mapped cache, two-way set associative cache.

**3.246 cache hit.** *See:* hit.

**3.247 caching.** The process of accessing a cache.

**3.248 cage.** *See:* card cage.

**3.249 calculating punch.** A calculator, with card reader and card punch, that reads data from a punch card, performs some arithmetic operations or logic operations on the data, and punches the results on the same or another punch card. *Syn:* multiplying punch.

**3.250 calculator.** A device that is suitable for performing logic and arithmetic digital operations, but that requires manual intervention to initiate each operation. *See also:* calculating punch.

**3.251 capacitor.** An element within a circuit consisting of two conductors, each with an extended surface exposed to that of the other, but separated by a layer of insulating material called the dielectric. *Note:* The dielectric is designed so the electric charge on one conductor is equal in value but opposite in polarity to that of the other conductor. *See also:* storage capacitor.

**3.252 capacitor storage.** A type of storage that uses the capacitive properties of certain materials.

**3.253 capstan.** A rotating shaft within a tape drive that pulls the tape across the read or write heads.

**3.254 card.** (1) A generic term used as an abbreviation for a circuit board. (2) An input medium made of paper-board, formed in a uniform size and shape such that it may be punched or marked and sensed electronically. *See also:* magnetic card; mark-sensing card; punch card.

**3.255 card cage.** A chassis in which a printed circuit board may be mounted.

**3.256 card code.** The set or combination of punched holes in a punch card that represent a character.

**3.257 card column.** A single vertical line of punch positions on a punch card. *Contrast with:* card row.

**3.258 card deck.** A group of punch cards.

**3.259 card duplicator.** *See:* card reproducing punch.



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