

hardware 硬件

Wiki:

Computer hardware (or simply hardware in computing contexts) is the collection of physical elements that constitutes a computer system. Computer hardware is the physical parts or components of a computer, such as the monitor, keyboard, computer data storage, hard disk drive (HDD), graphic cards, sound cards, memory (RAM), motherboard, and so on, all of which are tangible physical objects.

Foundations of computer science:

Computer hardware today has four components under the von Neumann model, although we can have different types of memory, different types of input/output subsystems, and so on.

百度:

计算机硬件（Computer hardware）是指计算机系统中由电子，机械和光电元件等组成的各种物理装置的总称。

software 软件

Wiki:

Computer software, or simply software, is that part of a computer system that consists of encoded information or computer instructions, in contrast to the physical hardware from which the system is built. Computer software includes computer programs, libraries and related non-executable data, such as online documentation or digital media. Computer hardware and software require each other and neither can be realistically used on its own.

Foundations of computer science:

The main feature of the Turing or von Neumann models is the concept of the program. Although early computers did not store the program in the computer's memory, they did use the concept of programs. Programming those early computers meant changing the wiring systems or turning a set of switches, on or off. Programming was therefore a task done by an operator or engineer before the actual data processing began.

百度:

计算机软件(Software, 也称软件)是指计算机系统程序及其文档, 程序是计算任务的处理对象和处理规则的描述; 文档是为了便于了解程序所需的阐明性资料。

Chips 芯片

Wiki:

An integrated circuit or monolithic integrated circuit (also referred to as an IC, a chip, or a microchip) is a set of electronic circuits on one small plate ("chip") of semiconductor material, normally silicon. This can be made much smaller than a discrete circuit made from independent electronic components. ICs can be made very compact, having up to several billion transistors and other electronic components in an area the size of a human fingernail.

百度:

指内含集成电路的硅片，体积很小，常常是计算机或其他电子设备的一部分。

Transistors 晶体管

Wiki:

A transistor is a semiconductor device used to amplify or switch electronic signals and

electrical power. It is composed of semiconductor material usually with at least three terminals for connection to an external circuit. A voltage or current applied to one pair of the transistor's terminals changes the current through another pair of terminals. Because the controlled (output) power can be higher than the controlling (input) power, a transistor can amplify a signal.

百度:

晶体管 (**transistor**) 是一种固体半导体器件, 具有检波、整流、放大、开关、稳压、信号调制等多种功能。晶体管作为一种可变电流开关, 能够基于输入电压控制输出电流。与普通机械开关 (如 **Relay**、**switch**) 不同, 晶体管利用电讯号来控制自身的开合, 而且开关速度可以非常快, 实验室中的切换速度可达 100GHz 以上。

Moore's Law 摩尔定律

Wiki:

Moore's law is the observation that the number of transistors in a dense integrate circuit doubles approximately every two years. The observation is named after Gordon Moore, the co-founder of Intel and Fairchild Semiconductor, whose 1965 paper described a doubling every year in the number of components per integrated circuit and projected this rate of growth would continue for at least another decade. In 1975 looking forward to the next decade, he revised the forecast to doubling every two years. The period is often quoted as 18 months because of Intel executive David House, who predicted that chip performance would double every 18 months (being a combination of the effect of more transistors and the transistors being faster).

百度:

摩尔定律是由英特尔 (Intel) 创始人之一戈登·摩尔 (Gordon Moore) 提出来的。其内容为: 当价格不变时, 集成电路上可容纳的元器件的数目, 约每隔 18-24 个月便会增加一倍, 性能也将提升一倍。换言之, 每一美元所能买到的电脑性能, 将每隔 18-24 个月翻一倍以上。这一定律揭示了信息技术进步的速度。

Computer architecture 计算机系统结构

Wiki:

In computer engineering, computer architecture is a set of rules and methods that describe the functionality, organization, and implementation of computer systems. Some definitions of architecture define it as describing the capabilities and programming model of a computer but not a particular implementation. In other definitions computer architecture involves instruction set architecture design, microarchitecture design, logic design, and implementation.

百度:

计算机系统结构是计算机的机器语言程序员或编译程序编写者所看到的外特性。所谓外特性, 就是计算机的概念性结构和功能特性, 主要研究计算机系统的基本工作原理, 以及在硬件、软件界面划分的权衡策略, 建立完整的、系统的计算机软硬件整体概念。

CPU 中央处理器

Wiki:

A central processing unit (CPU) is the electronic circuitry within a computer that carries out the instructions of a computer program by performing the basic arithmetic, logical, control and input/output (I/O) operations specified by the instructions. The term has been used in

the computer industry at least since the early 1960s. Traditionally, the term "CPU" refers to a processor, more specifically to its processing unit and control unit (CU), distinguishing these core elements of a computer from external components such as main memory and I/O circuitry.

计算机科学导论:

中央处理单元(CPU)用于数据的运算。在大多数体系结构中，它有三个组成部分：算术逻辑单元(ALU)、控制单元、寄存器组（快速存储单元）。

RAM 随机存取存储器

Wiki:

Random-access memory is a form of computer data storage. A random-access memory device allows data items to be read or written in almost the same amount of time irrespective of the physical location of data inside the memory. In contrast, with other direct-access data storage media such as hard disks, CD-RWs, DVD-RWs and the older drum memory, the time required to read and write data items varies significantly depending on their physical locations on the recording medium, due to mechanical limitations such as media rotation speeds and arm movement.

Foundations of computer science:

Random access memory (RAM) makes up most of the main memory in a computer. In a random access device, a data item can be accessed randomly — using the address of the memory location — without the need to access all data items located before it. All information in RAM is erased if you turn off the computer or if there is a power outage.

计算机科学导论:

随机存取存储器(RAM)是计算机中主存的主要组成部分。在随机存取设备中，可以使用存储单元地址来随机存取一个数据项，而不需要存取位于它前面的所有数据项。该术语有时因为ROM也能随机存取而与ROM混淆，RAM和ROM的区别在于，用户可读写RAM，即用户可以在RAM中写信息，之后可以方便地通过覆盖来擦除原有信息。RAM的另一个特点是易失性。当系统断电后信息（程序或数据）将丢失。换句话说，当计算机断电后，储存在RAM中的信息将被删除。RAM技术又可以分为两大类：SRAM和DRAM。

Hard Drive

Wiki:

A hard disk drive (HDD), hard disk, hard drive or fixed disk[b] is a data storage device used for storing and retrieving digital information using one or more rigid rapidly rotating disks (platters) coated with magnetic material. The platters are paired with magnetic heads arranged on a moving actuator arm, which read and write data to the platter surfaces. Data is accessed in a random-access manner, meaning that individual blocks of data can be stored or retrieved in any order and not only sequentially. HDDs are a type of non-volatile memory, retaining stored data even when powered off.

硬盘（英语：Hard Disk Drive，简称HDD）是电脑上使用坚硬的旋转盘片为基础的非挥发性存储设备，它在平整的磁性表面存储和检索数字数据，信息通过离磁性表面很近的磁头，由电磁流来改变极性方式被电磁流写到磁盘上，信息可以通过相反的方式读取，例如读头经过纪录数据的上方时磁场导致线圈中电气信号的改变。硬盘的读写是采用随机存取的方式，因此可以以任意顺序读取硬盘中的数据[2]。硬盘包括一至数片高速转动的磁盘以及放在执行

器悬臂上的磁头。

Flash Drive

Wiki:

A flash drive is a drive using flash memory.

Flash memory is an electronic (solid-state) non-volatile computer storage medium that can be electrically erased and reprogrammed.

File System 文件系统

Wiki:

In computing, a file system (or filesystem) is used to control how data is stored and retrieved. Without a file system, information placed in a storage medium would be one large body of data with no way to tell where one piece of information stops and the next begins. By separating the data into pieces and giving each piece a name, the information is easily isolated and identified. Taking its name from the way paper-based information systems are named, each group of data is called a "file". The structure and logic rules used to manage the groups of information and their names is called a "file system".

计算机科学导论:

文件是作为一个单元看待的外部相关数据的集合。文件的主要作用是存储数据。因为当计算机关闭时，主存中的内容将丢失，因此需要用文件这种更持久的方式来存储数据。另外，数据的集合经常很大而不能一次全部导入主存中。因此，必须能够在一部分数据留在文件中的情况下读写部分数据。

文件存储在辅助存储设备或二级存储设备中。两种最常见的二级存储设备是磁盘和磁带。文件在二级存储设备是可读写的。文件也可以以计算机只能写不能读的形式存在。例如，在系统监视器上显示的信息，就是一种类似于发送到打印机的数据形式的文件。广义上，键盘也是文件，虽然它并不能存储数据。