INTERNAL DEVICES OF THE COMPUTER AND THEIR WORKING PRINCIPLES.

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Annotation:
This article gives you a brief overview on computer hardware, its functions, and how it works.

Keywords: motherboard, router, processor, BIOS, cooler, SATA cable, random access memory (RAM), read-only memory (ROM), memory cache (permanent memory), hard disk, CD -ROM reader, network card, graphics card (video card), power supply.

Internal devices of the computer and their working principles. It is no exaggeration to say that the 21st century is the age of information technology. We cannot imagine our day without a computer. The computer will definitely help us to do our practical and theoretical work. We talk about how the information we enter and the information we receive from the computer actually reaches us. The actions we perform are performed by us using the external and internal devices of the computer. Some of the internal components of a modern computer are made by means of special devices, which means that they do not take up as much space as before. If you look at their structure, it looks like a normal layer, but there are a few chips in that layer. So, first of all, we need to understand the internal devices of the computer we are using.
Components of computer internal devices:
• She pays
• Router
• Processor
• BIOS
• Kuller
• SATA cable
• Random access memory (RAM)
• Read-only memory (ROM)
• Memory cache (permanent memory)
• Hard disk
• CD-ROM reader
• Network card
• Graphics card (video card)
• Power supply (power supply block)
Let's take a look at these internal devices from the beginning. The motherboard is the base board that contains all the circuits for connecting these devices and components. It is designed depending on the type of processor. It has all the basic components of a computer, including a hard drive, processor, memory, graphics card, and more. Most motherboards are expandable because they can be replaced to match the parts. For example, you can replace a hard drive with a larger memory capacity.
The router allows it to communicate with each other by transferring all the data between the internal parts. The width of the bus indicates the number of bits it sends to the processor at one time.
Processor. The brain of this computer controls its basic functions. It is responsible for reading and executing instructions from computer programs stored in computer memory. It also collects and stores the data that generates the data to be displayed after following the instructions. Processor speed is measured in MHz. This measurement shows how fast the processor can read electrical impulses. For example, a 100 MHz processor can read 100 million pulses per second. It has two main components, which are the control unit, whose function is to direct the system to execute instructions. The other component is the logic-arithmetic unit, whose

function is to perform all logical and arithmetic instructions. The principle of operation of the processor is the sequential processing of various operations.
They happen very quickly, the main ones are:
At the start of any process related to the execution of the program code, the CPU control unit receives all the necessary information and the set of operands required for execution. It is then loaded into the buffer or cache memory.
When exiting the cache, the entire information flow is divided into two categories - instructions and values. They are routed to appropriate memory locations called registers. The first is in command registers, the second is in data registers.
Data in memory registers is processed by an arithmetic logic unit. It is part of the processor needed to perform arithmetic and logic operations.
The calculation results are divided into two networks - completed and incomplete, which in turn are returned to the cache memory.
At the end of the calculation cycle, the final total RAM is written. This is necessary to free up buffer space for new computing operations. When the cache is full, all inactive processes are transferred to RAM or low level.
The main part of the CPU is called the core, which contains all the necessary blocks, as well as performs logical and arithmetic functions. If you look at the picture below, you can see what each functional block in the kernel looks like:
Download instruction module. The instructions here are recognized by the address specified on the command counter. The number of simultaneous readings of commands depends directly on the number of locks of passwords set, which helps to load each work cycle with the most commands.
The transition predictor is responsible for the optimal operation of the command receiver. It determines the sequence of commands that are executed when loading the core pipeline.
Decoding module. This part of the kernel is responsible for identifying certain processes to perform tasks. The decoding task itself is very difficult due to the variable instruction size. Most newer processors have several such blocks in a single core.
Data Selection Modules. They get the data from RAM or cache memory. They select exactly the information needed to execute the command.
Control block. The name itself already speaks to the importance of this component. The main thing is that it is the most important element, because it distributes energy between all the blocks and helps to perform each movement on time.
Results storage module. Designed for writing in RAM after processing. The storage address is specified in the running task.
Element of working with interruptions. The CPU is able to perform multiple tasks at the same time, which allows you to stop the development of a single program by switching to another program.
Registers. Here the temporary results of the instructions are stored, this component can be called small fast RAM. Often its size does not exceed a few hundred bytes.
Command counter. It stores the instruction address used in the next processor cycle.
The processor also includes a microprocessor, which performs the following functions: The microprocessor is the most functionally complex device in the PC. This device is powered by a code bus.
The command register is a memory register that stores the command code, ie the code of the operation and the addresses of the operands involved in the operation. Operation decoders are a logical block that selects one of the many output paths available from the command register in accordance with the operating code (OC). is a device that stores the control signals (pulses) required in the cell. located inside the interface section) - a device that calculates the full address of the memory (register) slot on the details coming from the command register and MPX registers.
In most cases, the BQ generates control signals designed to perform the following basic operations: select the location of the RAM storage device (RAM) slot in the next register of the program from the counter-register at the address of the MPX command; Select the code of the next team from the HTSQ slot and accept the compared team in the command register; decrypt operation codes and selected command characters; Comparison of firmware, which determines the order of execution of certain operations on all blocks present

in the machine, as well as the order of transmission of control signals to these blocks, from the cells corresponding to the decrypted operating code of the HTSQ; compare individual components of addresses of operands (numbers) participating in calculations from command registers and MPX registers and form complete addresses of operands; select operands (by generated addresses) and perform certain operations on processing these operands; save the results of the operation performed; is to form an address that belongs to the next command of the program. The microprocessor's encryption device transfers the information from us to its own language, the binary number system, and transmits it back to us in a language we understand.

Also, if we look at its discharges, what is a discharge? We answer that a computer is an operating system that represents the amount of data that can be processed at one time. The bits are divided into 3 types: 16, 32, 64.86 bits. That is, most people understand that the larger the processor's charge, the faster it runs, but in fact, the more the charge, the more data is received and transmitted in seconds. This means that the larger the discharge, the more data the computer loads and transmits. As a result, we naturally save time.

The cooler is a fan that removes the hot air present inside the computer, preventing the heat from stagnating and overheating the main components by moving it away from the source that generates it. This is an important part of a computer cooling system. Computers run faster because of the heat sink. In this case, the computer runs the risk of overheating, which completely destroys it.

SATA cable means this is a “combination of serial advanced technology”. Its function is that the cable can be used to connect storage devices such as DVD-ROMs and hard drives. It is designed to reduce transmission noise and improve airflow in the system.

Random access memory (RAM) is a type of temporary or variable storage of computer data on a device. It deals with temporary information requests, such as keeping windows open on the desktop or simply viewing a file. When the computer shuts down, the RAM loses all data. The function of RAM is that when an application is opened, it is stored in RAM from the hard drive. Data from RAM is much faster.

Read-only memory (ROM) is a type of memory that this device cannot replace. Unlike RAM, which is turned off when the power runs out, the ROM remains unchanged. These chips cannot be replaced because the code is loaded when it is generated.

Memory cache (RAM) The function of this device is to send / receive data to / from the processor at a higher speed before going to RAM or ROM, as these memories run at a lower speed. This speeds up the overall performance by providing the data to the processor immediately.

Hard Disk / Hard Disk (HARD) Programs and files are permanently stored on this device. More traditional drives are called hard drives (HDDs). It consists of a series of magnetic disks that rotate quickly to store data. The newest ones are called hard disk drives (SSDs) and they use an electrical circuit to store data. They work much faster than traditional hard drives.

A CD-ROM reader is a unit designed to read CDs and DVDs. They use lasers to read the data on the disk. They are usually connected to the motherboard via SATA cables.

A network card is used to connect multiple computers to each other over a network, and also allows the computer to connect to the Internet.

Graphics card (Video card) This device is also called a video card. Its function is to create graphics and images to display on a monitor. Without this card, data will not be displayed and therefore computers will be useless. It also produces quality and faster online games and videos. This means that the number of pixels has been significantly improved and the video can be viewed better.

The power supply (Blockpitaniya) converts alternating current from external power sources to low-voltage direct current so that all internal parts of the computer operate without interruption. In addition, it regulates the heat of the device, preventing overheating.

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