# Architecture of modern computers - Computer Science

The architecture of a modern computer is a schematic representation of its structure structure with an indication of the principles of operation of the components included in its composition.

## The concept of computer architecture

The architecture of a computer is a set of certain rules for the production of an electronic computing system, as well as the basic abilities and distinctive features of its technologies.

The architecture of a personal computer is usually used as a tool for testing standards. In other words, it is realistic to implement a computer system according to such a standard on the basis of formed schematic solutions and technologies.

The term "computer architecture" also refers to the methodology of assembling computers and their components. Thus, the architecture developed by a certain company is its intellectual property and can only be applied by it, being an instrument of its competitiveness. But, despite this, various brands use a common concept that combines the basic basic characteristics of different computer models, which makes their components universal.

The use of a unified architecture of personal computers enables computer manufacturing firms to work closely with each other to create and improve various components and technologies used. Combining different concepts into one architectural solution makes it possible to distribute certain models of personal computers on the market, allows various companies to design software packages that are suitable for a personal computer in any case.

## The classic version of the computer architecture

The initial composition of the computer architecture was proposed by the scientist Neumann, who was a famous mathematician. He outlined the basic principles of designing personal computers, taking into account their logical structure. This methodology, which Neumann proposed, is taken as the basis for the classical architecture of a personal computer. It should include the following basic elements

* a logical-arithmetic unit;
* management unit;
* external memory device unit;
* RAM block;
* data input/output unit.

In accordance with this structure, a certain order of operation of computer elements must be observed. Initially, information is loaded into the computer's memory from the program that is being executed. External computer devices are used for data entry. After that, the control unit transfers this data from the memory block to the information processing unit. Processing takes place using various computer elements.

## A modern version of the computer architecture

The architecture of a modern computer, although different from the classical one, is based on its base. The defining distinguishing feature of a modern personal computer is the presence of a central processor, which in fact is the connection of a control unit and a logical-arithmetic blog into a single system.

Previously, such a connection was almost impossible due to the massive size of the chips. To date, the development has made it possible to increase the degree of integration of microcircuits. The previously impossible has become possible, that is, putting a wide range of functions into a small-sized part. The architecture of today's personal computer also provides for the use of controllers. The need to use them is caused by the fact that the role of the processor as the main device that performs the function of exchanging information with external devices has changed. The I/O function has been removed from the processor, thanks to new chips. Various information exchange channels were developed, as well as chipsets, later called controllers.

## IBM Architecture

The architecture of a personal computer, designed by IBM, is essentially a world standard. Its main distinguishing feature is its open structure. In other words, personal computers, in accordance with this standard, have ceased to be the final completed branded products.

Note 1 IBM is a company that is one of the first in the computer manufacturing market to develop a generally recognized architecture.

But it is not a monopolist at the same time, that is, firms and companies that produce computers and their constituent elements themselves determine the composition of the assembly of personal computers. At the same time, it is always possible to modernize your personal computer by replacing components with more advanced ones. The implementation of the open architecture technology of modern computers has become possible due to the rapid pace of progress.

## Software and its structure in computers based on the IBM architecture

The main feature by which it can be determined that a personal computer belongs to the IBM platform is its ability to work on various operating systems. This is possible due to the open structure of this architecture. Computers with IBM architecture use Linux and Windows operating systems in various configurations, as well as, in addition, different operating systems compatible with the hardware of a personal computer with such an architecture.

Note 2 The IBM platform allows you to install not only programs from well-known brands, but also programs from little-known compilers, and at the same time the system does not require coordination of these programs with manufacturers of hardware components.

The IBM platform uses a standard data input/output system, called BIOS, which is part of all personal computers. Its task is to ensure the execution of basic operations of personal computers, regardless of the type of operating system installed on them. This moment is also a property of the openness of the architecture on the IBM platform, the authors of the BIOS system are tolerant of manufacturers of other operating systems and products. The very phenomenon of the release of the BIOS system as part of various brands is a property of the openness of the IBM platform.