

УДК 004.4

Settar Abliakimov¹, Valentina Kuzmenko²

¹student of group CST-118 ZNTU

²senior teacher ZNTU

IMPROVEMENT OF HARDWARE ARCHITECTURE

A computer is a multifunctional electronic device designed to accumulate, process and transmit information. The architecture of a personal computer is understood as its logical organization, structure, and resources, i.e., computing system tools that can be allocated to a data processing process for a specific time interval.

The construction of the most computers is based on the principles formulated by John von Neumann:

1. the principle of program management - the program consists of a set of commands that are executed by the processor automatically one after the other in a certain sequence;
2. the principle of uniformity of memory - programs and others are stored in the same memory; commands can perform the same actions as on the data;
3. the principle of targeting - the main memory is structurally composed of numbered cells.

Computers built on these principles have a classical architecture. The computer architecture defines the principle of operation, information links and the interconnection of the main logical nodes of the computer, which include:

1. central processor;
2. main memory;
3. external memory;
4. peripherals.

Structurally, personal computers are made in the form of a central system unit, to which other devices are connected through special connectors. The structure of the system unit includes all the main components of the computer: motherboard, power supply, hard disk drive, floppy disk drive, optical drive, connectors for additional devices. In turn, motherboard carries microprocessor, math coprocessor, clock generator, memory chips, external device controllers, sound and video cards, timer.

The architecture of modern personal computers is based on the trunk-modular principle. The modular principle allows the user to complete the computer configuration he needs himself and, if necessary, to upgrade it. The modular organization of the system is based on the main principle of information exchange. All device controllers communicate with the microprocessor and RAM through the system data bus, called the system bus. The system bus is implemented as a printed bridge on the motherboard.

A microprocessor is a central unit of a personal computer designed to control the operation of all units of a machine and to perform arithmetic and logical operations on information.

The system bus is the main interface system of the computer, which provides the interface and connection of all its devices among themselves. The system bus provides three directions of information transfer:

1. between the microprocessor and main memory;
2. between the microprocessor and the input / output ports of external devices;
3. between main memory and I / O ports of external devices.

The input-output ports of all devices are connected to the bus either directly or through special controllers (adapters) through the appropriate connectors (slots).

The main memory is designed to store and efficiently exchange information with other blocks of the computer. External memory is used for long-term storage of information that can be further used to solve problems.

The clock generator generates a sequence of electrical symbols, the frequency of which sets the clock frequency of the computer. The time interval between adjacent pulses determines the tact of the machine.

A power source is a unit that contains systems for autonomous and networked computer power.

The timer is an in-car electronic clock that provides an automatic pick-up of the current point in time. The timer connects to an autonomous power source and continues to operate when the computer is disconnected from the network.

A modern computer essentially can no longer exist without all of the external devices. Some users cannot do without them, and therefore this sphere continues to evolve to this day.