

Today in high-tech society there is no decisive opinion about directions for the development of hardware components and computer systems architecture. Multicore concept encounters with problem of core access to common memory. Moreover, this concept may be futureless on the question of power consumption. In connection with this, there is a demand for principally new disruptive innovations. Multicellular processor (MultiClet) is an example of such breakthrough innovation.

New processor is a result of realization of new patented multicellular architecture. The main difference with traditional nuclear architecture is that multicellular architecture operates with statements consisting of commands. Realization of all operations within each statement without memory involvement provides processor power increase in 4-5 times and reduction of energy consumption in 10 times.

A cell of typical multicellular processor on a frequency of 5 GHz will reach 10 GFlops performance, 64-cell crystal, accordingly, will reach 640 Gflops performance with 7.7 W power consumption. Teraflops supercomputer with 1.2 Tflops performance and 15.4 W total energy consumption will be based on two 64-cell processors, 2000 crystals will provide 1.2 Pflops. And, finally, 1.2 Eflops computer system performance and 15.4 MW energy consumption will be reached by using 2 million 64-cell processors.

It is important to note that such performance is reached independent from class of problems. Modern computation models for supercomputers have high power consumption and can consume more than 1kilowatt of energy. So high energy costs necessitate to invent special-purpose all-powerful cooling systems. E.g. T-Platforms Inc. (Russia) is developing computing platform for supercomputers with 1 Pflops performance that will be cooled by water. But such decision opens issues of security, availability and and clearance value.

'Multicellular processor will make an epoch in computational technologies. Implementation of systems capable of performing more than quintillion operations per second is not science fiction today. Implementation of supercomputers is a really pressing problem in USA, Europe, Japan, China and Russia', Boris Zyryanov, CEO of MultiClet Corp. says.