

APPLICATION OF MPI TECHNOLOGY FOR ALLOCATED CALCULATIONS

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The number of NP-full problems has not decreased, but even increased recently. Now we have a lot of superchallenging problems, the of which decision demands great computing capacities and resources. Among these problems are weather forecasting, climate changes, global changes in atmosphere, cryptography, structural biology, superconductivity, astronomy, etc. It is possible to divide these problems into those dealing with processing considerable amounts of data (inquiries to databases) and the problems with a moderate, but a very complex calculation process (exact calculation of mathematical or physical constants, factorization of numbers). One of the basic approaches to the decision of these problems is connected with the creation of powerful computation resources using various architectures. There is no computing system which cannot be compared in peak productivity, volume of operative and disk memory to the total resources of the Internet. Now there exist in the world several projects which unite thousands and even hundreds of thousand computers via the Internet for the solution of some urgent problems, Distrubuted.net, Seti@home, Legion, etc. among them. The occurrence of several computing kernels on one computing platform has opened a new page in the development of parallel calculations. Now even trivial algorithms giving solution to daily problems can have allocated realization, raising thereby an overall performance as a whole.

Computing systems exchange data in the course of allocated calculations. From the point of view of a programmer there exists two paradigms of this process: through divided memory with the organization of synchronization of access and in the form of messages.

The first method is a base for the SMP-machines, the second - for networks of all types, but each of them has advantages and disadvantages.

The SHM models is the most perspective in our time because functions of work with SHM are a part of each multitask operational system. In one computer the means of interprocessor communications are realized through SHM and consequently obviously are faster.