ON SIMULATED PARALLELISM FOR SOLVING MATHEMATICAL PROBLEMS

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Problems of a real life that have to be solved by methods of numerical mathematis or linear algebra, usually are rather large and complicated. The best way to solve those problems by a computer is usually usage of parallel computers and parallel programming methods. Still, the ability to acquire a computer of enough power, size, or speed is sometimes impossible due to financial and technological limitations.

Recent developments of theory and practice of mobile-agents methodology and widespread interest in World Wide Web (WWW) and network-centered programming offered a possible solution to this problem. This new paradigm is giving a new approach to the architecture and implementation of distributed systems.

A mobile agent is a program that can move around a network if necessary, and communicate with its environment and other agents. We will try to show that mobile agents may be very well suited to simulate parallel processing.

Even though mobile-agents paradigm is relatively young and still highly under academic research, there is a fairly large group of available working mobile-agents systems, some of them commercial, while most still in a phase of scientific exploration. For a mobile-agent to be executed on the different host environments, each host must have specialized support software. If this software IS installed, mobile agents can be used to simulate parallelism. The "main" computer sends mobile-agents performing programs solving parts of a numerical problem, to a different computers. Those computers MUST be connected, but that connection is a simple intra or inter-net connection.

The main advantage of mobile agents in general theory is that they can bring a program closer to the information resources. Here, we will try to show that they can also perform some other tasks, help with some other types of problems, simulation of parallel processes, for example. The mobile-agent makes the use of the server's basic services in the way and quantity that its owner intends. Mobile-agents provide no new functionality that cannot be achieved with traditional client-server interaction, however, they make implementing any new functionality much easier. The main goal of my paper will be to discuss the possibility of simulating parallelism by using mobile agents.