ATS
Advanced Technical Services

mpC Workshop

Integrated Parallel Programming System for Heterogeneous Networks of Personal Computers

Turn your network of PCs into a supercomputer

The mpC Workshop is an integrated development environment for the mpC parallel programming language. It is intended for unleashing all the power of an ordinary Windows-based network of desktops to perform computationally and communicationally intensive tasks that are usually performed on specialized parallel systems.

Tapping the power

A capability cluster is used as a collective computational power of several computational nodes for solution of a single problem as rapidly as possible.

The mpC Workshop makes a high-performance capability cluster from your office network.

Heterogeneity support

Office network has one principal difference from specialized parallel system. As a rule it consists of computers with different performances. Heterogeneity is the main obstacle to exploit the full performance potential of an office network. mpC programming environment is designed especially for those who face this problem in their work.

Product features

Efficiency

mpC relates to C+MPI in parallel programming in the same way as C relates to Assembly in sequential programming. C offers practically the same flexibility and efficiency as the Assembly language does and Assembly has very restricted area of application. Development of mpC-based parallel applications is much simpler as compared to C+MPI but provides practically the same performance.

Efficient portability

The main idea underlying mpC is that an mpC application explicitly defines an abstract network and distributes data, computations and communications over the network. The mpC programming system uses this information to map the abstract network to any real executing network in such a way that ensures efficient running of the application on this real network. This mapping is performed at run time and based on information about performances of processors and links of the real network, dynamically adapting the program to the executing network.

Load balancing for heterogeneous networks

mpC offers the facilities to operate with quantitative network characteristics such as relative performances of the processors. mpC programming environment allows estimating the performances of processors at run time by means of execution of the most appropriate benchmark.

Multi-paradigm parallel programming

mpC programming environment supports the writing both task parallel and data parallel applications.

Development of parallel applications is now easier than ever

mpC Workshop is an Integrated Environment for development of parallel applications. mpC Workshop uses the client-server model with GUI environment on the client side and mpC command-line environment on the server side. On the client side you create and edit mpC source files, specify settings for building executables and initiate building and debugging. Client sends commands to server and the server performs them. Executable is built on one of machines and broadcasted to other machines that will take part in execution of the parallel program.

mpC Workshop includes:

full-featured syntax-oriented editor

mpC compiler

run-time support system

Virtual Parallel Machine management tool

A Virtual Parallel Machine represents a network of computers on which an mpC program will be executed.

source-level parallel mpC debugger

The main advantage of the mpC parallel debugger is that it allows user to look at a parallel program as a whole not as a set of separate processors communicating with each other.

Debugger allows:

- seeing a lot of useful information without entering commands. The mpC parallel debugger displays all the important information about a single process, showing the source code, stack trace, and stack frame for the process.
- debugging remote programs over network, even over internet.
- handling executable so as to control execution of any group of processes and to keep track of values of variables in any process of the parallel program.

adviser

This tool provides additional semantic information making possible to find out some semantic bugs before program execution.

System requirements

mpC Workshop Server:

- Operating System: Windows 2000 SP2 (or later)
- C Compiler: Microsoft Visual C++ 6.0 SP4 (or later)
- MPI: MPI Pro 1.6.4
- Disk space: at least 25Mb

mpC Workshop Client:

- Operating System: Windows 2000 SP2 (or later)
- Disk space: at least 40Mb

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