DISTRIBUTED & PARALLEL PROGRAMMING TOOL (DPPT)

ABSTRACT

DPPT is a GUI(Graphic User Interface) based distributed and parallel programming tool which supports the programmers to develop parallel applications on distributed systems. DPPT has two main modules: the first part is a visual environment and the second part is a communication library with a runtime system.

With the visual environment, DPPT allows the programmers to split a big problem into some smaller problems and these smaller problems are modeled as modules in DPPT. DPPT provides fully graphical means for the specification of inter-modules communication graphs. This specification can be showed in two ways: functional hierarchic relation and data relation of modules. After that DPPT supplies the programmers the means to edit the properties of modules as well as the source code for them. DPPT also provides the programmers the facilities to map, compile, run application, etc.

When a big problem is divided into several modules, these modules are required to communicate and to exchange data in the running time. DPPT provides an interprocess communication library for distributed and parallel programming. This library supports a mechanism for communication among processes in heterogeneous network computers using both message passing and shared memory model. The message passing interface supplies point-to-point communication mechanism between two processes based on TCP/IP protocols and implemented above BSD socket library. Besides, the processes can send and receive data through a distributed shared memory that is implemented based on CREW PRAM (concurrent read exclusive write parallel random access memory) model. Multithread techniques are used widely in this model for read/write synchronization, improving performance, etc. The library also supplies functions for converting data presentation among hosts in a heterogeneous network of Unix workstations based on XDR. One of its advantages is that it can be used with other tools as an individual package.

DPPT – Distributed and Parallel Programming Tool – is developed in a network of workstations of Unix Solaris System V operating system with C/C++ programming languages.