Abstract

Parallel processing is being used more and more to solve complex problems in the computing world. Common to all parallel processing is the exchange of data in between various processes of computing. One of the main paradigms used for this is message passing. Message passing can be a serious source of overheads for the efficiency of parallel algorithms. The topology, or layout, or the way computers are physically interconnected with each other, dramatically affects the overhead created by message passing.

It is believed that parallel algorithms designed with communication schemes of parallelization for specific network topologies, out perform the more general equivalents when performing on their network of predilection. To develop these algorithms, more research is required on the effects of topology on message passing overheads.

NTS – Network Topology Simulator is a tool designed to help study the effects of topology on parallel algorithms. NTS simulates a network topology and is able to run a standard PVM (Parallel Virtual Machine) program on this simulated network. A PVM parallel algorithm requires only minor changes to be able to run on NTS and experience the effects of the various simulated topologies.

Tools, such as EPPA (Experimental Parallel Performance Analysis) or the internal performance recording facilities of NTS, can then be used to investigate the effects of the simulated topology on the parallel algorithm.

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