Abstract

Balancing the computational load over multiprocessor networks is an important problem in massively parallel systems. The key advantage of such systems is to allow concurrent execution of workload characterized by computation units known as processes or tasks. The scheduling problem is to maintain a balanced execution of all the tasks among the various available processors (nodes) in a multiprocessor network. This paper studies the scheduling of tasks on a pool of identical nodes which are connected through some interconnection network. A novel dynamic scheduling scheme named as Two Round Scheduling (TRS) scheme has been proposed and implemented for scheduling the load on various multiprocessor interconnection networks. In particular, the performance of the proposed scheme is evaluated for linearly extensible multiprocessor systems, however, a comparison is also made with other standard existing multiprocessor systems. The TRS operates in two steps to make the network fully balanced. The performance of this scheme is evaluated in terms of the performance index called Load Imbalance Factor (LIF), which represents the deviation of load among processors and the balancing time for different types of loads. The comparative simulation study shows that
the proposed TRS scheme gives better performance in terms of task scheduling on various linearly extensible multiprocessor networks for both uniform and non-uniform types of loads.

References


**Index Terms**

Computer Science

Parallel Systems

**Keywords**

Dynamic Scheduling  Multiprocessor  Interconnection Network  Tasks  Two Round Scheme