A Hybrid Algorithm to Solve Group Mutual Exclusion Problem in Message passing Distributed Systems

Abstract

In the present paper, we propose a hierarchical algorithm to solve the group mutual exclusion (GME) problem in cluster-based systems. We consider a two-level hierarchy in which the nodes are divided into clusters and a node in each cluster is designated as coordinator which is essentially the cluster head. The number of global messages per critical section entry in our algorithm depends upon the number of clusters in the system unlike most of the existing GME algorithms where it depends upon the total number of nodes in the system. Performance of the algorithm directly depends on the coherent behavior of nodes inside clusters. The results have been substantiated with extensive simulation. A fault tolerant extension of the algorithm has also been proposed in the present exposition.

References

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Index Terms

Computer Science

Algorithms

Keywords

Concurrency  Group Mutual Exclusion  Hybrid  Token.