Abstract

In multiprocessor environment when processes content for system resources, Deadlocks may occur. Deadlock is highly undesirable as it degrades the system performance largely. This paper aims to present technique to facilitate the resource allocation decision. It also strives to reduce the time cost for making this decision. It presents a Total Need Based Resource Reservation (TNRR) that suggests reserving some resources so as to ensure that at least one process will complete after it. The motivational example illustrate that the proposed technique is capable of performing resource allocation without checking the safety sequence as proposed by existing Banker’s algorithm. The overhead for this decision for proposed TNRR is merely $O(m)$ as compared to Banker’s algorithm of the $O(mn^2)$. The simulation results indicate that the frequency of deadlocks has reduced by approximately 75% for higher load (above 80%) as compared to the Deadlock Recovery technique, while for lower load it tends to be zero. The turnaround time of the TNRR is approximately 9% better than the existing Banker’s algorithm.

Refer
A Total Need based Resource Reservation Technique for Effective Resource Management

A Total Need based Resource Reservation Technique for Effective Resource Management

- Wojciech Cellary, "A New Safety Test For Deadlock Avoidance," Information Processing Letters, Volume 8, number 8, March 1979

Index Terms

Computer Science Communications

Keywords

Banker’s Algorithm Deadlock Deadlock avoidance Deadlock Recovery Operating systems Scheduling Safety sequence