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论文

允许多处理机故障的实时任务容错调度算法

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摘要
随着故障处理机个数增加，基于主/从版本技术的实时容错调度算法对处理机利用率迅速下降。论文提出了一种能够调度周期和非周期混合实时任务的容错调度算法，该算法允许多个处理机出现故障。把DS(Deferrable Server)算法扩展到多处理机系统，可在系统中设置多个DS服务器来处理非周期任务。当处理机出现故障时，通过在其他处理机上回卷执行故障任务，保证了系统的容错性能。实验结果表明，该算法能够使系统接收的所有实时任务满足截止期限并有效地减少了所需的处理机数。

关键词 实时容错调度 整体调度 混合任务 延时服务器 多处理机故障

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A Real-time Fault-tolerant Scheduling Algorithm for Multiple Processor Faults

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Abstract
The existing fault-tolerant scheduling algorithms are mainly based on primary/backup copies technology and the utilization of processor decreases greatly with the number of faults increases. In this paper, a real-time fault-tolerant scheduling algorithm is proposed to schedule periodic and aperiodic tasks jointly and tolerate multiple processor faults. The DS (Deferrable Server) algorithm is extended to the multiprocessors system, and several deferrable servers can be set to schedule aperiodic tasks. The faults can be tolerated by tasks' rollback executing on the other processors. The experimental results demonstrate that this algorithm can guarantee all accepted tasks' deadlines and decreases the number of required processor significantly.

Key words Real-time fault-tolerant scheduling Global scheduling Hybrid tasks Deferrable server Multiple processor faults

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