

学术探讨

利用作业可塑性改进结合回填FCFS策略的性能

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摘要 结合回填的FCFS策略是超级计算机上使用最为普遍的调度策略, 针对该策略在响应时间和系统利用率等方面的不足, 提出了改进其性能的DGA方法。该方法利用并行作业的可塑性, 通过调度时对作业平均响应时间的预测来选择适合的作业请求规模, 并利用遗传算法来解决最优作业资源请求的搜索问题。模拟器上实际作业流的模拟结果表明: 该方法可以显著地改进结合回填的FCFS策略的调度效果, 也优于已有的可塑性作业调度策略。

关键词 [并行作业调度](#) [FCFS](#) [作业可塑性](#) [遗传算法](#)

分类号

Improve performance of FCFS combined with backfill based on moldability of parallel jobs

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Abstract

One of the most popular scheduling algorithms is FCFS (First-Come-First-Served) combined with backfilling in the batch system for supercomputer, but it has some insufficiencies in the turnaround time and the utilization because of lacking flexibility. In this paper, presents a DGA (Dynamic Genetic Algorithm) method which dynamically decides resource allocation based on moldability of the parallel jobs. When determining a processor number for a job, DGA attempts to balance this job with all other jobs in the waiting queue by predicting the mean turnaround time and to choose an optimized processor number by genetic algorithm. The experiment results on the simulator with the realistic workload show that DGA method both outperforms the conventional backfilled FCFS strategies such as EASY approach and outperforms other moldable job scheduling strategies such as Cirne-Berman approach.

Key words [parallel job scheduling](#) [First-Come-First-Served \(FCFS\)](#) [moldability](#) [genetic algorithm](#)

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