# The Study of Dynamic Scheduling Optimization in The Computing Grid


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**ABSTRACT**

The Grid computing is gaining more attentions in the computer society. This new technology offers more flexibility, compatibility, and computing power than the traditional distributive systems. It integrates heterogeneous computing devices and storages on the internet through middleware software. Since the jobs are submitted to the Grid continuously and in an unpredictable rate, scheduling the jobs to be processed by the Grid becomes an important problem. Conventional scheduling strategies, such as First Come First Serve (FCFS), Shortest Job First (SJF) and so on, fail to address the issue because that they try to reach an optimal plan with the tradeoff of high scheduling costs and with the assumption of knowing all jobs arrivals in advance. Other iterative algorithms, such as Genetic Algorithm, Ant System, and so on, are still not well-suited in the Grid environment since they tend to generate optimal solutions with an unacceptably high scheduling cost. In this research, we develop a dynamic scheduling technique that explores the parallelism of the sub-jobs and combines the advantages of the Highest Response Ratio Next algorithm to improve the performance of the Grid and enhance the utilization of its processing elements. Our scheduling algorithm assigns the sub-job with highest priority to the next processing element that will complete the sub-job in the shortest time. We also adapt the communication cost in our model to reflect the real situation in the internet environment. In terms of job completion time, job turnaround time, processing element utilization, the experimental results show that our strategy offer better outcomes than some traditional scheduling algorithms. We are optimistic that the proposed scheduling strategy will improve the overall Grid performance.



Keywords : Grid Computing ; Dynamic Scheduling ; Job Assignment ; Directed Acyclic Graph


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