

A Genetic Algorithm based Dynamic Scheduling Algorithm in Heterogeneous Grid Computing Environment

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Abstract

Grid computing can integrate the computing resources from different network and regional areas as a virtual high performance computational platform. With the use of this high performance platform, the time cost in processing complex computing-intensive problems can be shortened greatly. Scheduling is an important issue in grid computing environment. Because of the differences in computational capabilities and network status of computational resources, an efficient scheduling algorithm is necessary to assign jobs to the appropriate computing nodes. In this paper, we propose a genetic algorithm based dynamic scheduling algorithm (DSGA) to solve the scheduling problems in grid environments. The proposed algorithm uses the optimal searching technique of genetic algorithm and takes different computing capabilities of computing nodes and dynamic network status into consideration. So the near-optimal scheduling solution can be got. In order to prove the performance of DSGA, a simulation with randomly generated task sets was performed, and it was then compared with four other scheduling algorithms. The simulation results show that the proposed DSGA outperformed all other schedulers across a range of scenarios.

Keyword : heterogeneous environment, grid computing, genetic algorithm