عنوان مقاله:

A Data Replication Algorithm for Improving Server Efficiency in Cloud Computing Using PSO and Fuzzy Systems

محل انتشار:

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خلاصه مقاله:

In different scientific disciplines, large-scale data are generated with enormous storage requirements. Therefore, effective data management is a critical issue in distributed systems such as the cloud. As tasks can access a nearby site to access the required file, replicating the desired file to an appropriate location improves access time and reliability. Replicating the popular file to an appropriate site is a good choice, as tasks can get the necessary file from a nearby site. In this research, a novel data replication algorithm is proposed that is consisted of four main phases: ۱- determining ۲۰% of commonly used files, ۲- computing five conflicting objectives (i.e., average service time, load variance, energy consumption, average response time and cost) ۳- finding the near-optimal solution (i.e., suitable locations for new replica) by the PSO technique to acquire a trade-off among the desired objectives. ۴- replica replacement considering a fuzzy system with three inputs (i.e., Number of accesses, size of replica and the last access time). The experimental results denote that the proposed replication algorithm outperforms the Profit oriented Data Replication (PDR) and Bee colony-based approach for Data Replication (BCDR) strategies in terms of energy consumption, average response time, load variance, number of connections, Hit ratio, Storage usage, and cost.

کلمات کلیدی:

Cloud Computing, Data Replication, Meta-heuristic algorithms, Fuzzy Systems, Power consumption