

Weighted Data Replication Strategy for Data Grid Considering Economic Approach

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Abstract : Data Grid is a geographically distributed environment that deals with data intensive application in scientific and enterprise computing. Data replication is a common method used to achieve efficient and fault-tolerant data access in Grids. In this paper, a dynamic data replication strategy, called Enhanced Latest Access Largest Weight (ELALW) is proposed. This strategy is an enhanced version of Latest Access Largest Weight strategy. However, replication should be used wisely because the storage capacity of each Grid site is limited. Thus, it is important to design an effective strategy for the replication replacement task. ELALW replaces replicas based on the number of requests in future, the size of the replica, and the number of copies of the file. It also improves access latency by selecting the best replica when various sites hold replicas. The proposed replica selection selects the best replica location from among the many replicas based on response time that can be determined by considering the data transfer time, the storage access latency, the replica requests that waiting in the storage queue and the distance between nodes. Simulation results utilizing the OptorSim show our replication strategy achieve better performance overall than other strategies in terms of job execution time, effective network usage and storage resource usage.

Keywords : data grid, data replication, simulation, replica selection, replica placement

Conference Title : ICCSE 2014 : International Conference on Computer Science and Engineering

Conference Location : Kuala Lumpur, Malaysia

Conference Dates : August 25-26, 2014