Replica Placement and Predictive Replica Selection Techniques to Improve the Performance of Data Grid

Dr. Kingsy Grace R*; Dr. Manimegalai R**

*Associate Professor,
Department of CSE,
Sri Ramakrishna Engineering College,
Coimbatore, Tamil Nadu, India.

**Professor & Director-Research,
Department of CSE,
Park College of Engineering and Technology,
Coimbatore, Tamil Nadu, India.

Abstract

Data grid is a hardware and software infrastructure built on top of Internet and provides sharing and management of distributed data resources. Dynamic data replication techniques are used in data grids to enhance data sharing with reduced access latency and bandwidth consumption. Creating and placing duplicate copies of popular files in data grid is replica placement, whereas, replica selection is selecting the best location to access data for executing job in data grid. Efficient techniques with load balancing and prediction based on SVM and AHL that improve and optimize the replica placement and selection are introduced in this paper. The proposed algorithms reduce the makespan i.e. total job execution time, storage consumption and effective network usage. The proposed techniques consist of two phases. In the first phase, all the nodes in the same region are grouped together and replica is placed in the highest degree and highest frequency node in the region. During second phase, SVM & AHL are used for predicting the behavior of user applications. The jobs are executed in the grid with predicted events. Simulation results reveal that the proposed methodologies perform better in terms of makespan, storage consumption and replication count.

Keywords: Data Grid; Makespan; Replica Placement; Replica Selection.
References


