

# Knowledge Base for Adaptive Decision Making in Autonomous Grid Monitoring Middleware

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## Abstract

As distributed systems become bigger and more widely distributed, making autonomous grid monitoring part of Grid middleware becomes very important. So Grid monitoring has been a focus for a long time. In this paper we focus on the architecture of an autonomous Grid monitoring middleware which constrains a knowledge base to develop for pro-active learning models from autonomous Grid monitoring. We have considered providing quality of service in a more general distributed system environment in which long-running applications may require long-term availability and performance of grid resources. The current implementation monitoring middleware in data grid and computing grids do not include knowledge base of history data used in prediction and decision making in job submission, data management, replica management etc. There are replica selection techniques but their scope is to select a replica among its local cache of replicas that is predicted to provide the best performance for the requesting client. In most cases replica selection is based on response time prediction to make decisions to reduce client response time. The scope of our work is to develop an autonomous Grid middleware architecture using knowledge base for prediction based adaptive decision making algorithms used to predict the grid resource behavior. The data will comprise of active monitoring based on processes, scheduling latency, bandwidth, latency, propagation delay, protocol overhead, buffer handling overhead, Storage, E2E performance monitoring etc. These decision based on the data in knowledge base will be used for consistency in quality of service, replica management and work load management by selecting reliable resources for job submission in computational grids and data management on data grid according to the priorities.