

Database workload management through CBR and fuzzy based characterization

ABSTRACT

Database Management System (DBMS) is used as a data source with financial, educational, web and other applications from last many years. Users are connected with the DBMS to update existing records and retrieving reports by executing workloads that consist of complex queries. In order to get the sufficient level of performance, arrangement of workloads is necessary. Rapid growth in data, maximum functionality and changing behavior tends the database workload to be more complex and tricky. Each DBMS experiences complex workloads that are difficult to manage by the humans; human experts take much time to manage database workload efficiently; even in some cases it may become impossible and leads toward malnourishment. This problem leads database practitioners, vendors and researchers toward new challenges. To achieve a satisfactory level of performance, either Database Administrator (DBA) or DBMSs must have the knowledge about the workload shifts. Efficient execution and resource allocation of workload is dependent on the workload type that may be either On Line Transaction Processing (OLTP) or Decision Support System (DSS). The research introduces a way to manage the workload in DBMSs on the basis of the workload type. The main goal of the research is to manage the workload in DBMSs through characterization, scheduler and idleness detection modules. The database workload management is performed by using the case based reasoning characterization; Fuzzy logic based scheduling and finally detection of CPU Idleness. Results are validated through experiments that are performed on real time and benchmark workload to reveal effectiveness and efficiency.

Keyword: Workload; Autonomic DBMS; Characterization; Scheduling; Idleness detection