AN ANALYTICAL MODEL FOR EVALUATING DATABASE UPDATE SCHEMES

by

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Abstract

A methodology is presented for evaluating the performance of database update schemes. The methodology uses the M/Hr/1 queueing model as a basis for this analysis and makes use of the history of how data is used in the database. Parameters have been introduced which can be set based on the characteristics of a specific system. These include update to retrieval ratio, average file size, overhead, block size and the expected number of items in the database.

The analysis is specifically directed toward the support of derived data within the relational model. Three support methods are analyzed. These are first examined in a central database system. The analysis is then extended in order to measure performance in a distributed system. Because concurrency is a major problem in a distributive system, the support of derived data is analyzed with respect to three distributive concurrency control techniques -- master/slave, distributed and synchronized.

In addition to its use as a performance predictor, the development of the methodology serves to demonstrate how queueing theory may be used to investigate other related database problems. This is an important benefit due to the lack of fundamental results in the area of using queueing theory to analyze database performance.

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