

A non-intrusive approach to distributed and parallel database query processing

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Abstract:

Read-only intensive applications, such as OLAP, demand high-performance from their underlying database systems in order to achieve low response time, which is crucial for decision making. They typically access huge amounts of data through high-cost read-intensive ad-hoc queries. High-performance processing in database systems has traditionally been achieved through parallel database systems running on multiprocessor servers. Data are typically partitioned and replicated between multiprocessor nodes for each of them to process queries in parallel over different data subsets. This approach is very efficient, but expensive in terms of hardware and software. Besides, the database management system must have full control over the database fragments, which makes it very expensive to migrate from a non-parallel environment. Database Clusters (DBC) are a very efficient low-cost alternative to tightly-coupled multiprocessor database systems. A DBC is defined as a cluster of PC each of them running an off-the-shelf sequential DBMS. These DBMS are orchestrated by a middleware that implements parallel query processing techniques. In DBC distributed data is seen as virtual partitions. Data partitioning techniques are going to be defined on the relational, object and XML models. Parallel query processing on virtual fragments are going to be presented and discussed. Parallel performance results will be shown. Finally some generic techniques on scientific data fragmentation in many task computing are going to be analyzed.

Biography:

Marta Mattoso is a Professor of the Department of Computer Science at the COPPE Institute from Federal University of Rio de Janeiro since 1994, where she leads the Distributed Database Research Group. Dr. Mattoso's current research interests include distributed and parallel databases and data management aspects of scientific workflows. She is the principal investigator in research projects in those areas, with funding from Brazilian agencies, including CNPq, CAPES, FAPERJ, FINEP and INRIA-France. She has published over 100 refereed international journal articles and conference papers. She has served in program committees and is a regular reviewer of international journals.