A Multidatabase System Implementation on CORBA

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Abstract

METU INteroperable Database System (MIND) is a multidatabase system that achieves interoperability among heterogeneous, federated DBMSs. MIND architecture is based on OMG distributed object management model. It is implemented on top of a CORBA compliant ORB, namely, ObjectBroker. MIND provides users a single ODMG-93 compliant common data model, and a single global query language based on SQL. This makes it possible to incorporate both relational and Object oriented databases into the system. Currently Oracle7, Sybase and METU OODBMS (MOOD) has been integrated to MIND. The main components of MIND are a global query processor, a global transaction manager, a schema integrator, interfaces to supported database systems and a graphical interface.

All local databases are encapsulated in a generic database object with a well defined single interface. This approach hides the differences between local databases from the rest of the system. Global database interface of the MIND is also the same with generic database object. When a client application issues a global SQL query to access multiple databases, this global query is decomposed into local subqueries and these subqueries are sent to the ORB (CORBA's Object Request Broker) which transfers them to the relevant database servers on the network. On a server site, the local subquery is executed by using the corresponding call level interface routines and the result is returned back to the client again by the ORB. The results returned to the client from the related servers are processed by the client if necessary.

In MIND, the integration of export schemas is currently performed manually by using an object definition language (ODL) which is based on OMG's interface definition language. The DBA builds the integrated schema as a view over export schemas. The functionalities of ODL allow selection and restructuring of schema elements from existing local schemas.

MIND global query optimizer aims at maximizing the parallel execution of the subqueries. Through MIND global transaction manager, the serializable execution of the global transactions are provided.

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