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A Generative Approach for Building Database Federations

Uwe Hohenstein

Abstract

A comprehensive, specification-based approach for building database federations is introduced that supports an integrated ODMG2.0 conforming access to heterogeneous data sources seamlessly done in C++.

The approach is centered around several generators. A first set of generators produce ODMG adapters for local sources in order to homogenize them. Each adapter represents an ODMG view and supports the ODMG manipulation and querying. The adapters can be plugged into a federation framework. Another generator produces an homogeneous and uniform view by putting an ODMG conforming federation layer on top of the adapters.

Input to these generators are schema specifications. Schemata are defined in corresponding specification languages. There are languages to homogenize relational and object-oriented databases, as well as ordinary file systems. Any specification defines an ODMG schema and relates it to an existing data source. An integration language is then used to integrate the schemata and to build system-spanning federated views thereupon.

The generative nature provides flexibility with respect to schema modification of component databases. Any time a schema changes, only the specification has to be adopted; new adapters are generated automatically

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