

Integrating XML Documents within a CORBA-based Multidatabase System

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Abstract

One main advantage of implementing a multidatabase system on CORBA (CORBA-based multidatabase system) is the ability to include many objects of different kinds such as file systems, spreadsheets, and workflow systems with other different DBMSs participated to such multidatabase system. Recently, XML is fast emerging as the dominant standard for representing data in the World Wide Web. At the same time, the relational databases get more and more employed in order to store the content of a web site. Thus, the integration of XML with relational database systems has received a considerable research. In this paper, we first introduce our designed CORBA-based multidatabase system –Panorama* and then we investigate the ability to apply the integration of XML with relational database systems in a CORBA-based multidatabase system. This integration extends the ability of a CORBA-based multidatabase system to implement data sharing and interoperability.

1. Introduction

During the last decade, several multidatabase approaches have been proposed to address the issues of integrating heterogeneous data sources and to achieve the interoperability among them. In the earliest prototypes, multidatabase systems are able to provide interoperability only among DBMSs and cannot handle repositories, which do not have DBMS capabilities. Later, the use of CORBA as an infrastructure of multidatabase systems has made it possible to provide interoperability of these systems with other repositories that do not have DBMS capabilities [1].

On the other side, XML has recently become the standard for information interchange due to its flexibility, portability, and simplicity. Database and object environment vendors have

* Panorama: is a CORBA-based multidatabase system developed at HUST, Wuhan, P. R. of China.

already committed to supporting XML as one way outputting their data, particularly for publication purposes, but also for interoperability with other software [2]. Therefore, the modern integration in a multidatabase system requires seamless access to any kind of sources, whether they reside locally or on the Web, whether they have structured or semi-structured data, and whether they feature full-fledged query languages or limited sets of textual queries [3].

Further more, due to the new requirements emerging from several application areas such as e-commerce, the employment of databases to store the content of a web site is of great need [4] [5]. Therefore, an increasing importance of the integration of XML and database systems (DBS) with respect to storage, retrieval, and update has been motivated. Among the different kinds of DBSs (special-purpose, object-oriented, object-relational, and relational DBSs) could be used for the integration, the more promising alternative to store XML documents are relational database systems. Such integration would provide several advantages such as reusing a mature technology, seamlessly querying data represented in XML documents and relations, and the possibility to make legacy data already stored within an RDBS available for the web.

In this paper, we first introduce our designed CORBA-based multidatabase system –Panorama and briefly explain the registration method of its data source components to CORBA. Then, we discuss the mapping techniques of the XML documents to a relational database system. A generic approach for integrating XML with relational database system, called X-Ray, is also introduced. This approach could be further implemented in a CORBA-based multidatabase system for achieving the interoperability of XML with multidatabase systems. The implementation of this approach has been introduced in the last section. Finally, a conclusion and future work have been presented.