Abstract

This dissertation discusses the realization of object persistence, in a CORBA-based distributed system, through the integration of the Object Request Broker (ORB) with an Object Database Management Systems (ODBMS). Three approaches to persistence of CORBA objects are described. The first one, *pseudopersistence*, makes object references persistent, but not transparently storable. The others, *smart pointer-based persistence* and *virtual persistence*, provide transparent storability to object references, both in the case of references to local objects and in the case of references to remote objects. We stress the ORB and ODBMS features each approach depends upon, and point out the ones not fully standardized at the present time.

A software component, the Object Database Adapter (ODA), is responsible by the integration of an ORB with an ODBMS. We include a report on the use of an ODA in a real-world telemedicine application, a distributed, object-oriented, CORBA-based patient record system developed at the Los Alamos National Laboratory.

A performance evaluation of the aforementioned approaches to persistence of CORBA objects is presented. Our quantitative results reveal the good performance of pseudopersistence, the effectiveness of active object caching, the promising performance of smart pointer-based persistence, and the penalty paid for using virtual persistence with the single commercially available ODBMS to which this approach is applicable.