Invited Talk

Breaking Through to Remote Data and Services

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Abstract

Most large-scale applications integrate remote services and/or transactional databases. Yet building software that efficiently invokes distributed service and accesses relational databases is still quite difficult. Existing approaches to these problems are based on the Remote Procedure Call (RPC) and Object-Relational Mapping (ORM). RPCs have been generalized to distributed object systems with remote proxies, a kind of remote object reference. ORM tools generally support a form of query sub-language for efficient object selection. The last 20 years have produced a long litany of technologies based on these concepts, including ODBC, CORBA, DCE, DCOM, RMI, DAO, OLEDB, SQLJ, JDBC, EJB, JDO, Hibernate, XML-RPC, Web Services and LINQ. Even with these technologies, complex design patterns for service facades and/or bulk data transfers must be followed to optimize communication between client and server or client and database, leading to programs that are difficult to modify and maintain. While significant progress has been made, there is no widely accepted solution or even agreement about what the solution should look like. In this talk I present a new unified approach to invocation of distributed services and data access. The solution involves a novel control flow construct that partitions a program block into remote and local computations, while efficiently managing the communication between them. The solution does not require proxies or an embedded query language. Although the result itself is elegant and useful, what is more significant is the realization that the original problems cannot be solved using existing programming language constructs and libraries. This work calls into question our assumption that general-purpose programming languages are truly general-purpose.

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Bio

William R. Cook is an Assistant Professor in the Department of Computer Sciences at the University of Texas at Austin. His research is focused on object-oriented programming, programming languages, modeling languages, and the interface between programming languages and databases. Prior to joining UT in 2003, Dr. Cook was Chief Technology Officer and cofounder of Allegis Corporation. He was chief architect for several award-winning products, including the eBusiness Suite at Allegis, the Writer's Solution for Prentice Hall, and the AppleScript language at Apple Computer. At HP Labs his research focused on the foundations of object-oriented languages, including formal models of mixins, inheritance, and typed models of object-oriented languages. He completed his Ph.D. in Computer Science at Brown University in 1989