

Java and Relational Databases: SQLJ

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1. ABSTRACT

This Tutorial presents the latest developments in the area of Java and Relational Databases. The material is based on the SQLJ consortium effort whose goal is to leverage Java technology for SQL processing. The SQLJ effort is driven by major industry vendors such as Oracle, Sybase, Tandem, JavaSoft, IBM, Informix and others. The SQLJ specifications describe Embedded SQL in Java, Java Stored Procedures, Java UDFs and Java Data Types.

1.1 Keywords

SQL; Java; JDBC; SQLJ; ORDBMS; Java Relational.

2. Overview

The SQLJ specifications describe ways for Java to be used with SQL. SQLJ describes Java with Embedded SQL, Java Stored Procedures and UDFs and Java Data Types; SQLJ is well integrated with the JDBC API. The SQLJ approach to routines and data types is sometimes referred to as *Java Relational*.

3. JDBC

JDBC provides Java programmers with a Call Level Interface to perform dynamic SQL operations. JDBC 1.0 is now widely supported by database systems and tools. JDBC 2.0 is adding features that allows the application and the database to exchange structured data, including Java objects or SQL3 objects.

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4. Embedded SQL

SQLJ Embedded SQL allows Java programmers to include SQL clauses in their Java programs. The SQLJ Translator is then used to perform design time validation of the SQL statements and replace them with Java code. SQLJ Embedded SQL also specifies a vendor neutral runtime infrastructure and a vendor neutral representation of the preprocessed SQL statements. This allows compiled applications to be portable across different database systems. Finally, some databases will install the preprocessed SQL statements as statically optimized plans.

5. Java Stored Procedures and Java UDFs

SQLJ Stored Procedures and SQLJ User-Defined Functions allow the programmer to write these routines in Java and install them in the form of JAR files into the database. SQL operations are expressed by either coding Embedded SQL or raw JDBC calls. Client applications use JDBC, ODBC, etc. to invoke these procedures. By contrast, Java UDFs may be invoked from within SQL DML statements.

6. Java Data Types

With SQLJ Data Types programmers may use Java Classes to declare the types of columns, procedure parameters, etc. Java represents a very attractive choice for expressing complex types in a database, due to features like object-pass-by-value or the sandbox execution model. SQL DML statements are extended to permit the access to Java methods for relational operations such as project, filter, etc.

7. REFERENCES

- [1] SQLJ Specifications, Contact gclossma@us.oracle.com or Phil.Shaw@sybase.com.
- [2] JDBC Specification, <http://java.sun.com/products/jdbc>.