Introduction

The business of medium and large-sized enterprises is statically structured by branches settled in geographically distributed locations. Data replication in business services, such as remote database access where applications issue transactions, is a way to boost:

- **Information Availability.** By storing redundant information at different sites makes data more available.

- **Performance.** Applications need only to access their “closest” node for executing transactions. Hence, read-only transactions are specially benefitted by this approach as no interaction is needed with other nodes.

- **Failure Resilience.** If a node crashes then applications accessing that node will be redirected to the remaining alive nodes.

Two major obstacles need to be overcome when introducing replication:

- **Developing Replication Protocols.** They are in charge of maintaining data consistency. Their code development is error-prone and introduces additional overhead.

- **Application Specific Needs.** Each application has different degrees of information consistency and availability.

We propose a middleware database replication architecture (CONFIA) that tries to solve the previous drawbacks:

- **SQL Usage.** CONFIA uses standard SQL constructs and ready-made SQL functionality for meta data management. Thus, reducing their complexity and their overhead.

- **Switching among Replication Protocols.** CONFIA maintains meta data for several protocols. Replication strategy can be configured and re-configured seamlessly in order to satisfy the specific application needs or network conditions.

CONFIA Middleware Architecture

The three components of the architecture are:

- **User Application.** It accesses to the system by way of transactions.

- **Database Replication Middleware.** This is the core component of CONFIA.
  - Independent of the underlying DBMS.
  - A Java implementation exporting JDBC driver interface to clients.
  - Intercept and redirect user requests.
  - Communication with the rest of replicas.
  - Swapping of replication protocols.

- **DBMS.** It contains a physical copy of the replicated database.
  - Database extensions to support meta data management.
  - Triggers and stored procedures automatized the meta data management.

Conclusion

We have presented CONFIA, a database replication middleware architecture, that caters for high availability and different consistency degrees of data.

References