eXtremeDB 4.1 Extends Embedded Database Strengths in Key Areas

McObject announced it has released *eXtreme*DB 4.1, an upgrade to its real-time embedded database system, with new features that will benefit developers and end-users in diverse areas including reliability, performance, data security, ease-of-use and internationalization.

The improvements enhance *eXtreme*DB's competitiveness in its traditional embedded systems software market, as well as in the high-growth "real-time enterprise" field of high volume financial, social network and other performance-intensive Web-based systems. "Version 4.1 focuses on improvements in core things that *eXtreme*DB does: managing data with breakthrough efficiency, adding safety and durability, and streamlining software development and maintenance. As such, we expect widespread adoption among existing as well as many new eXtremeDB users," said Steve Graves, McObject Co-founder and CEO.

Already, a major European manufacturer is using *eXtreme*DB 4.1's new support for custom database collations to build the competitive advantage of supporting search in multiple languages into its digital television electronic program guides (EPGs). Newly-added encryption and additional new security features target applications ranging from large-scale defense and intelligence systems to digital rights management (DRM) in multimedia devices. Improvements in how *eXtreme*DB organizes data on disk and flash media will accelerate processing of very large databases, which is critical in many enterprise applications.

Enhancements included in *eXtreme*DB 4.1 include the following:

Support for custom collations. *eXtreme*DB 4.1 adds "hooks" that enable developers to provide a desired character sorting sequence (collation) for data stored as text, including collation that supports a particular language or combination of languages. Developers creating products with search and other text-processing functions for a global marketplace have already taken advantage of this feature, which moves *eXtreme*DB well beyond the default, single-fixed-collation capability of most embedded databases.

Binary schema evolution. This enables *eXtreme*DB to save a database as a binary image and then restore it with a changed schema, or layout of tables, fields, indexes and other elements. For example, a financial trading application could be more easily enhanced to accommodate a new type of futures contract or other investment; an older portable media player (PMP) design that does not display "album art" could be updated with firmware that supports that capability. With this new feature, database design changes are accomplished more quickly, using less memory and storage, than with the previous (and still available) *eXtreme*DB approach to schema evolution using XML import/export.

Faster on-disk storage and retrieval. Version 4.1 improves the Disk Manager process that manages interaction with persistent media (hard disk, flash, etc.) in *e*X*treme*DB Fusion, McObject's hybrid in-memory/on-disk embedded database. Improvements include enhanced "locality of reference" (related objects are stored closer to one another); improved ability to keep entire objects on the same page; reduced file fragmentation; and better statistical information, which is important for SQL optimization.

"The updated Disk Manager's benefits span the software development markets served by *e*X*treme*DB. For applications that use persistent storage, performance is improved transparently, without code changes or explicit developer action, with further improvement possible through minor application code changes. Examples range from flash-based embedded multimedia devices that must respond to the user's command by instantly finding and loading content, to large-scale analytics applications that must sift through millions of objects kept in RAID storage," Steve Graves said.

CRC and RC4 encryption. These new options detect tampering and secure the database from intruders, respectively. Cyclic Redundancy Check (CRC) on the database page level detects whether unauthorized modification to stored data has occurred, while RC4 encryption employs a user-provided cipher to prevent access or tampering. These new features have already generated interest from defense/aerospace companies seeking additional safety in equipment that stores sensitive information such as battle plans. Page-level CRC can also be used in devices such as portable audio players to ensure digital rights management code has not been circumvented.

CRC-checking on backup. Starting in version 4.1, Cyclic Redundancy Check is also employed to add reliability in the backup/restore feature of *e*X*treme*DB in-memory databases. CRC executes automatically when a file is loaded to ensure the databases has not been corrupted, and when it is saved, to verify that the file has been written in its entirety.

Improved transaction logging. *e*X*treme*DB version 4.1 adds the ability to restore a database from transactions logged up to a specific date/time or according to an "application-defined bookmark." In the case of an accidental mass deletion or change, this gives *e*X*treme*DB the ability to restore to the last backup, and then replay transactions up to, but not including, the error.

Using *e*X*treme*DB, organizations eliminate the need to create custom data management code, or to shoehorn a DBMS designed for slower business applications into a real-time system. This results in reduced development and support costs, faster applications and more satisfied users. For manufacturers, *e*X*treme*DB's frugal appetite for memory and CPU cycles lowers hardware costs, resulting in savings that drop to the bottom line, or can be used to reduce end-user price and gain market share. Whether handling critical data for a combat jet's navigation system or managing a real-time Web application for financial services, *e*X*treme*DB offers multiple features – from a type-safe programming interface to

optional High Availability and 64-bit editions – to build in rock-solid reliability, durability and data integrity.

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