eXtremeDB™
for Financial Applications

Financial Systems: The Database Challenge

A real-time database provides a reliable, zero-latency foundation for algorithmic trading and other time-sensitive financial systems.

Trading numbers and market data are skyrocketing. Financial software's success hinges on leveraging this data to act instantly on price changes, deliver up-to-the-second analytics, and perform other real-time tasks. These rely on the application's underlying approach to sorting, retrieving and storing information. But conventional relational database management systems (RDBMSs) often cannot deliver the speed, reliability and flexibility these applications demand.

That's why financial system developers are turning to McObject's *eXtreme*DB, a database system that acts as an accelerator, rather than a bottleneck, for application performance. *eXtreme*DB's unique architecture "designs out" database latency and maximizes responsiveness and predictability. And with a competitive feature set that includes SQL and transaction logging, as well as support for very large and scalable distributed databases, *eXtreme*DB is the ideal choice for fast, efficient and reliable database management in a variety of financial applications.

Designed to Eliminate Latency Spikes

System latency can spell the difference between a successful trade and a missed opportunity. *eXtreme*DB's design is based on a core in-memory database system that eliminates performance-inhibiting disk I/O, caching logic, data transfer, and other overhead. It's no surprise that *eXtreme*DB started out in applications such as telecom routing and industrial control, where latency and unpredictability are intolerable.

Many features—including SQL support and a 64-bit database version—now enhance *eXtreme*DB's use in non-embedded applications, leading to its wide use in real-time commodity exchange trading platforms, ticker plants, desktop trading systems, and other critical market functions. These applications benefit from the fact that *eXtreme*DB's underlying high-performance engine remains accessible, offering unique tools for optimization. *eXtreme*DB's safety features, which are critical to many financial systems, include ACID (Atomic, Consistent, Isolated and Durable) transactions' guarantee of data integrity, as well as database recoverability via transaction logging.
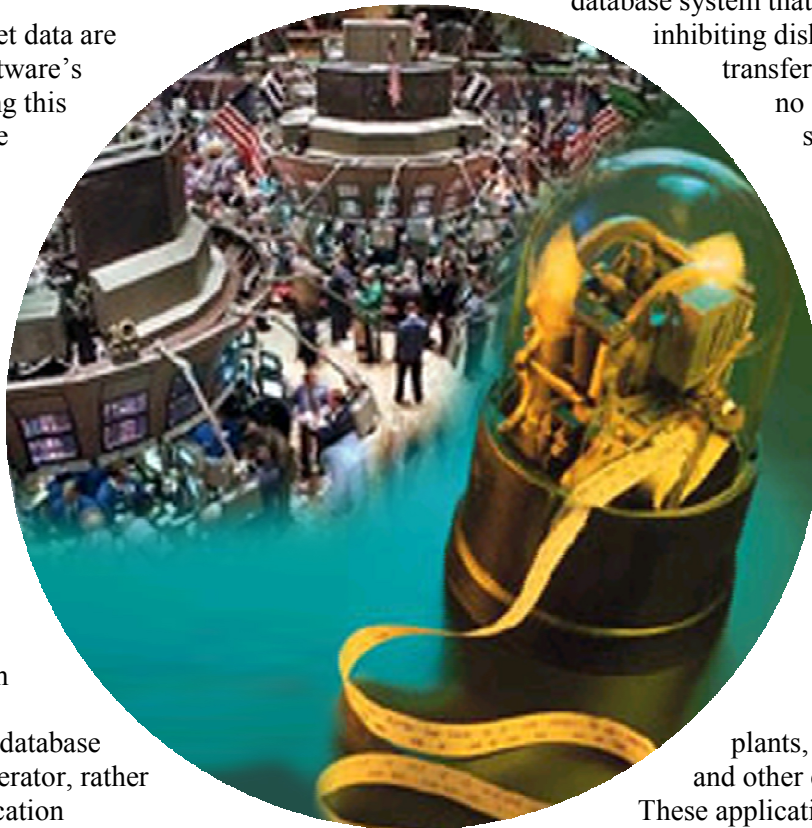
Tools for Developer Flexibility

*eXtreme*DB's ultra-fast native API is ideal for performance-critical code, yet is fully compatible with its SQL implementation. For storage on permanent media, the *eXtreme*DB Fusion edition lets the developer specify which tables will be saved to disk, while keeping the rest of the database in memory. Transaction logging is parameterized, to enable different levels of transaction durability and allow intelligent trade-offs between performance and risk for unrecoverable transactions.

*eXtreme*DB Features and Benefits

Distributed Database – The proven *eXtreme*DB High Availability edition offers maximum reliability. It puts a copy of the database on each node, eliminating network latency and resulting in ultra-fast queries.

Breakthrough performance. Sources of *eXtreme*DB's performance edge include an in-process architecture that eliminates client/server inter-process communication overhead, multiple APIs, and customized internal memory managers designed for multi-threaded, multi-core applications.

Interoperability. *eXtreme*DB's fast native API interoperates fully with its SQL API (*eXtreme*SQL). The native interface is ideal for time-sensitive operations, while *eXtreme*SQL (with its ODBC support) permits higher level access and interfacing with many external systems.

Support for large data stores. Exchange-wide trading typically requires large volumes of information to be available continuously. McObject leads in-memory database vendors in support for very large databases (VLDBs). Our benchmark white paper (available at www.mcobject.com) documents performance as high as 87.78 million query transactions per second in a 1.17 TB (15.54 billion row) database.

Industry-tested solution – Financial applications using *eXtreme*DB include ticker plant technology from Stockgroup Information Systems, the real-time trading platforms of major commodities exchanges, and desktop trading deployed by a leading Chicago-based private securities trading firm.

Developer efficiency – *eXtreme*DB's support for multiple data and index types, its advanced debugging capabilities and an intuitive, type-safe API boost developer productivity, for faster time-to-market and better, safer code.

Application Areas

Algorithmic, arbitrage and other trading systems, ticker plants, risk management, portfolio management, analytic libraries, fund management.

Technical Specs

- Code size from 50K to 250K, depending on the platform and features.
- Source code and object code licenses are available.
- Transaction performance measured in microseconds.
- In-memory and on-disk data storage co-exist within *eXtreme*DB Fusion database instances, via simple database schema declarations.
- Transaction Logging can be set to different levels of transaction durability, allowing intelligent trade offs between performance and risk for unrecoverable transactions.
- 64-bit edition offers real-time processing of very large databases (VLDBs); in tests managing databases larger than one terabyte, *eXtreme*DB-64 processed 87.78 million query transactions per second (benchmark report is available).
- Supports virtually all data types, including structures, arrays, vectors, BLOBs and Unicode.
- Querying methods include B-tree, R-tree, Patricia tries, hash table and custom indexes.
- Native C/C++ and SQL interfaces; supports varied data types and sophisticated debugging features.

Architectures Supported

32-bit, 64-bit, x86, x64, SPARC, PA-RISC, PowerPC and others.

Operating Systems Supported

HP-UX, Sun Solaris, Windows, Linux, AIX and others.

Precision Data Management