

# eXtremeDB™ Fusion for Military and Aerospace Applications

For MilAero systems that demand high performance, simplified development, and the utmost in safety and reliability.

"eXtremeDB helped cut 18 programmer months from the development cycle."

-- Boeing

## Overview

Military and Aerospace (MilAero) systems have evolved into substantial computing platforms that are tightly integrated and continuously share information, both internally and with other systems. This growing volume of complex data presents multifaceted embedded database requirements, including high performance, concurrent access, high availability, and efficient searching.

Above all, defense and aerospace applications must be dependable and secure. Any component software part—including an embedded database engine—must be predictable, immune from crashes, and must not harm or interfere with other application processes.

eXtremeDB Fusion from McObject® is a small footprint Commercial Off-The-Shelf (COTS) database that meets the critical need for a real-time MilAero embedded database. eXtremeDB Fusion offers a tiny code footprint (as small as 50K) alongside advanced features including high availability, hybrid in-memory/on-disk data storage, and safety that is implemented at the programmatic level. Defense and aerospace manufacturers are enjoying its performance, reliability, and time-to-market benefits.

## Reliable and Secure by Design

When used as an in-memory database, the hybrid eXtremeDB Fusion operates near the speed of RAM access and eliminates unpredictable latency. With "eager, 2-safe" replication implemented via a time-cognizant protocol, the eXtremeDB High Availability edition provides unsurpassed uptime, with automatic failover. Developers can fine-tune an

application's persistence, using features such as eXtremeDB Fusion's optional on-disk storage capability, transaction logging and support for non-volatile RAM (NVRAM).

eXtremeDB Fusion reflects a development focus on safety and security, from the database system's features down to the implementation of its source code. The system avoids dynamic memory allocation, eliminating one potential hurdle in the certification process for airborne software. A type-safe application programming interface (API) prevents run-time bugs. Built-in database error handling provides diagnostics to help ensure that the software is being used properly.



## **eXtremeDB Fusion Features and Benefits**

**Hybrid data management** – eXtremeDB Fusion combines in-memory and on-disk data storage in one embedded database system, to optimize applications for persistence, speed, cost and form factor.

**Better, safer code** – Type-safe, intuitive C/C++ API shortens database learning curve, produces more easily maintained code, and eliminates costly run-time errors. Database design avoids dynamic memory allocation.

**High Availability** – With synchronous replication implemented via a time-cognizant, two-phase commit protocol, or ultra-fast asynchronous replication, eXtremeDB-HA delivers the highest degree of database reliability for applications that cannot afford to fail.

**Kernel mode database** – Integrating the database in software deployed as a kernel module delivers the ultimate in high-priority, zero-latency execution.

**Proven solution** – MilAero industry leaders including EADS, SAIC, Lockheed Martin, Northrop Grumman, IAI, Sandel Avionics and Boeing enjoy eXtremeDB Fusion’s technological and time-to-market benefits.

### **Application areas:**

Navigation and targeting; flight control; sensor data fusion; tactical data link integration; simulators and testing equipment; radio, telecom and netcom equipment; command and control systems; pilot assistance; training software; mission planning.

## **Technical Specs**

- Supports virtually all data types, including structures, arrays, vectors, BLOBs and Unicode.
- Querying methods include hash indexes for exact match searches; tree indexes for pattern match, range retrieval and sorting; “voluntary” indexes; object-identifiers for direct access; and more.
- Transaction performance measured in microseconds.
- APIs: Native, highly intuitive API is generated when DDL is compiled, thus reflecting application data model and purpose; high-performance SQL interface; XML interface for XML-based data exchange.
- Source code and object code licenses are available.
- 32K tables per database, 32K columns per table, 32K indexes per database, 32K columns per index. Max DB size 3GB (32-bit) or available memory (64-bit).

### **Architectures supported:**

32-bit, 64-bit, ARM, DSP, Embedded Intel® (Pentium, Embedded Intel® Architecture etc.), Freescale (Coldfire, MCore, HC08 etc), MIPS, Power Architecture™ (including PowerPC), x86, XScale

### **Operating systems supported:**

VxWorks, QNX Neutrino, Linux and embedded Linux distributions (Wind River, MontaVista, LynuxWorks etc.), Windows Embedded, Mentor Graphics/Nucleus, INTEGRITY, eCos, LynxOS, RTXC Quadros, uCLinux, µC/OS-II, HP-UX, Sun Solaris, Bare bones boards (no operating system required).