

Implementation

The *eXtremeDB/rt* kernel modifies the conventional *eXtremeDB* kernel by making sure that all database kernel components are time-cognizant. The *eXtremeDB/rt* transaction scheduler implements two algorithms: High Priority Earliest Deadline First (EDF) algorithm and Priority Inheritance. Developers choose the best algorithm for their system's execution pattern. Transaction deadlines are enforced through a time-cognizant rollback mechanism. The database kernel identifies transactions destined to be "late", interrupts them, and forces the rollback in time to satisfy the deadline. Transactions are allowed to modify or retrieve data only if they are able to complete within the set deadlines.

Supported Platforms

Real-time applications must run in the context of a real-time operating system, or be able to access hardware resources — interrupts, timers, memory management, etc. Therefore, *eXtremeDB/rt* is currently available for the following real-time operating systems on select hardware platforms (the list of platforms is constantly expanding).

OS	Vendor	Platform	Purpose
Deos™	DDC-I	NXP® iMX8QuadMax	Embedded
embOS	SEgger	STM32f769 (STMCube)	Embedded
FreeRTOS™	Amazon	ARM family including STM32F769, STM32F750N8, and NXP	Embedded
		iMX8QuadXPlus/QuadMax Cortex-M	Embedded
INTEGRITY®	Green Hills Software	ARM family	Embedded
Linux		ARM family	Embedded
		x86_64	Desktop evaluation
LynxOS-178®	Lynx Software Technologies	x86_64	Embedded
macOS	Apple	x86_64/ARM	Desktop evaluation
MICROSAR	Vector	NXP iMX8QuadXPlus Cortex-M	Embedded
Microsoft® Windows®	Microsoft	Visual Studio 2017, x64	Desktop evaluation
Nucleus®	Siemens	ARM family	Embedded
PetaLinux 2019.1	AMD Xilinx	Zynq™ UltraScale+™ MPSoC ZCU104 with ARM-A53	Embedded
QNX® 7.0/7.1	Blackberry®	ARM family including NXP iMX8QuadXPlus/QuadMax Cortex-A	Embedded
		x86_64	Desktop evaluation
ThreadX (AzureOS)	Microsoft	STM32f769	Embedded
		NXP RT1060	Embedded
VxWorks®	Wind River®	ARM family	Embedded

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