

Quadros™ Convergent Processing OS for i.MX

Freescale's advanced i.MX family of applications processors helps you quickly harness the power of wireless, broadband, multimedia and the Internet. Designed for use in smartphones, wireless PDAs, mobile games, GPS systems and many other mobile wireless applications, Freescale's i.MX applications processors are a leading solution in today's smartphone environment. To maximize the efficiency of a developer's application when using distinctly different processing models in the portable multimedia space, the RTXC Quadros™ dual-mode RTOS (RTXC/dm) with its dual-scheduling model supports both synchronous dataflow processing and asynchronous control processing in a single-kernel architecture that maximizes real-time responsiveness and eases the development process for customers.



i.MX Applications Processors

Based on ARM™ core technology, the i.MX family of applications processors is designed to offer low power consumption with real-world power performance and a high degree of integration to reduce your design time significantly.

The i.MX Family supports a broad range of industry-leading platforms such as those based on the Microsoft® Windows® CE operating systems, Palm OS, Linux® OS, and Symbian™ operating systems.

Evolved from the best-selling DragonBall™ family of applications processors, the i.MX Family consists of the cutting-edge i.MX21, i.MX1 and i.MXL, tiered offerings for different types of handheld and smart devices. The i.MX portfolio is a central feature of Freescale's i.Smart smartphone reference design, providing powerful performance to our Innovative Convergence™ platforms.

Smart Speed

- > Efficient energy management
- > Application-specific acceleration

Multimedia

- > Hardware based acceleration
- > MPEG-4 encode and decode

Security

- > Includes security framework with hardware and software elements
- > Protects services and high value content
- > Provides trusted operating environment
- > Enables Digital Rights Management (DRM)

Optimizing Streaming Media Performance with Real-Time Control

The unique structure of the RTXC Quadros RTOS supports dataflow processing for multimedia applications such as audio and video streaming with a cooperative scheduling model for rapid context switching and, in the same kernel architecture, supports the hard, real-time and general processing needs of the application with a prioritized, preemptive, event-driven model. To complement the on-chip peripherals and application needs of the i.MX family, from MP3 players to smartphones, Quadros provides i.MX developers with a wide range of optional stacks and middleware integrated with the RTXC/dm RTOS. These include RTXC Quadnet TCP/IP (with Mobile IP option), IPsec/IKE security module, RTXCflashfile, IrDA, Bluetooth™, and USB host/device support, plus the PEG GUI development tools and libraries.

Learn More: For more information about Freescale products, please visit www.freescale.com.

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Integrated Software Solutions to Power Up Your i.MX Development



Real-Time Operating Systems

Quadros Systems solutions start with the flexible and configurable RTX C Quadros™ family of real-time operating systems. RTX C Quadros is a second-generation RTOS platform designed to deliver the flexibility, scalability and code preservation required by today's embedded systems. The RTX C Quadros RTOS family is comprised of four highly scalable real-time operating systems offering distinct performance advantages for each of the major processing models.

- **RTXC/ss** (single-stack) uses a cooperative scheduler to support high-data-rate and signal-processing applications.
- **RTXC/ms** (multistack) is optimized for control processing using an event-driven, prioritized, preemptive kernel.
- **RTXC/dm** (dual-mode) marries RTX C/ms and RTX C/ss and is ideal for convergent processing applications that combine high-speed dataflow and control processing in a single-core architecture.

Both RTX C/ms and RTX C/dm are brought together under RTX C/mp (multiprocessing) in various combinations to support multicore and multiprocessor implementations

Integrated Add-On Software

Speed your product to market with the confidence in using tested and integrated communications stacks and drivers for Freescale's i.MX on-chip peripherals, including communications, graphics/LCD and file systems.

- **RTXC Quadnet™ TCP/IP**—High-performance, zero-copy network-ing software, IPv4 and IPv6. Plus Web server, e-mail, security (IPsec/IKE, SSL) and more
- **RTXCusb™**—Host and device stacks and class drivers for USB
- **PEG+ and C/PEG**—Graphics development tools and libraries
- **RTXCfatfile™**—Windows®- and DOS-compatible file system for removable memory (e.g. SecureDigital card, MMC, hard drive)
- **RTXCflashfile™**—High-performance, fail-safe file system for resident Flash memory



Convergent Processing with RTX C/dm

The RTX C Quadros dual-mode real-time operating system (RTXC/dm) delivers the design flexibility of both a task-based and a thread-based architecture in a single RTOS. This allows the developer to take full advantage of the multimedia capabilities of Freescale's i.MX processors.

When a traditional RTOS is used to process audio and video streams, efficiency and overall data throughput can be adversely affected. The same is true when control system application code runs in an executive designed for dataflow processing.

RTXC/dm brings these two processing models together in a single RTOS. Combine control processing with high-speed algorithms. Run high-speed audio/video streams using the low-overhead threads while processes such as TCP/IP communications or user interface functions run as tasks.

RTXC Quadros RTOS Overview

Support for DSPs, Microcontrollers and Multiprocessing.

Versatile family supports needs of all embedded computing environments. Common API enables easy migration across architectures and applications while preserving your application code.

Flexible and Configurable. Choose the configuration that will deliver the performance, size and features for your applica-tion. The powerful configuration program, RTX Cgen™ allows easy selection of the kernel services you need.

Scalable. Easy to control your memory footprint; tailor RTOS resources to your application.

Easy to Use. Intuitive and well documented with a user-friendly manual.

Fast. Designed and coded to ensure low system overhead, low latency and responsive services.

Powerful. Offers a rich set of kernel objects and services, allowing you to manage thread/task execution, move data and manage time and other events and interrupts.

Development Tools Support. Support for popular development tools for ARM®-based architectures including ARM (ADS/RVD) IAR, and Metrowerks. Kernel awareness plug-ins are available for each of these tool families.

Integrated Stacks and Middleware. Communications stacks and middleware to support i.MX peripherals.

Contact and Ordering Information

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