

SELECTING AN EMBEDDED RTOS



FEATURED INTERVIEW:

EXCERPTED FROM WWW.EG3.COM

Prepared by:

eg3.com

Jason McDonald, Senior Editor

eg3.com

tel : 510.713.2150

email : info@eg3.com

web : <http://www.eg3.com>



INTERVALZERO - RTOS PRODUCTS & SERVICES, 2009

IntervalZero: RTOS Products & Services, 2009

INTERVIEWEE. BRIAN CARTER
 TEL. 781.996.4481
 EMAIL. Brian.Carter@IntervalZero.com
 COMPANY. INTERVALZERO
 WEB. <http://www.intervalzero.com/>

Q. First of all, tell us a little bit about yourself and your responsibilities at IntervalZero.

A. I'm IntervalZero's Vice-President of Marketing and Strategic Communications. My responsibilities include the development of the positioning and selling strategies and the messaging for our two software products – *RTX* and *ETS*. Additionally, I'm responsible for all inbound and outbound communications with our customers, partners and the media

Q. If you would, please give us a very brief, bulleted outline of your products. What sorts of real-time operating systems (RTOSes), tools, and/or services does your company offer?

A. We offer two deterministic, hard real-time software products – *RTX* and *ETS*.

RTX

IntervalZero's *RTX* software allows embedded systems developers to take advantage of the Windows® environment and form factor, and also solve the scheduling, prioritization and control challenges that are beyond the capabilities of a general-purpose operating system like Windows.

RTX extends the capabilities of Windows' general-purposed operating system. It is self-contained real-time subsystem that bypasses the Windows scheduler to provide deterministic control of the system hardware and deliver the required hard real-time response.

ETS

ETS is the smallest-footprint, stand-alone, RTOS that supports the Win32 API.

It is a high-performance micro-kernel real-time operating system with an optimal operational footprint of 88K. Developers can install, configure and start developing on *ETS* quickly. The *ETS* software development kit (SDK) provides a suite of tools that integrate into the standard Visual Studio IDE. The *ETS* Visual System Builder enables system developers to selectively choose the kernel components, and build the system from the bottom up.

Because *ETS* is Win32 API compliant, all the standard Windows conventions are maintained – APIs, memory management, mutexes and semaphore.

Q. What is IntervalZero's "unique value proposition" for the embedded systems engineer or programmer who is considering an embedded RTOS? What do you and your products do to help him get his product to market faster, cheaper, better?

- A. Where there is a need for very precise control of system hardware and/or where hard real-time performance is required, IntervalZero's *RTX* is uniquely positioned to help developers capitalize on Microsoft innovations that are changing the economics for embedded systems development.

The Windows Aeroglass platform and the Expression Blend Designer both position Microsoft to become the operating system of choice for embedded systems that require significant human/machine interaction, such as medical systems and in industrial automation. In both of these vertical markets there is significant demand for *RTX*'s determinism, and hard real-time capabilities.

With millions of developers already trained on Visual Studio, companies do not have to hire or engage with embedded developers who have specialized training in a complex, proprietary RTOS development environment. They can use Windows and *RTX* in combination. Fewer developers means less cost and streamlined development speeds time to market

An MRI medical system is a good example of the kind of deployment where IntervalZero *RTX* and Windows deliver that better product.

An MRI's human-machine interface is complex and Windows' well-understood, intuitive user interface simplifies the training of MRI technicians. However, there are several points of intersection on an MRI that demand a real-time componentry and precision that Windows cannot provide. Magnets must polarize cells and at precise moments image data must be captured and then moved to storage.

Previously, these precision tasks were handed off to microcontrollers or to other RTOSes, but more and more OEMs want to have a single unified environment and the RTOS-like tasks are being handled by *RTX* as an extension to Windows.

It is true that not all embedded applications have a complex human-machine interface. Some systems have little or no interface at all. In those situations, customers still want to develop the applications in the Windows environment using Visual Studio, but when the customer goes to actual deployment, they may want a low-cost, Win32 API compliant RTOS. *ETS* is a complete RTOS and its tool chain is integrated into Visual Studio for small footprint, low cost deployments.

Q. How are you different as a company from competitors? What sets your products apart from those of other RTOS companies?

- A. Again, the complementary nature of our products and the added value they deliver in the Windows environment sets IntervalZero's hard real-time products apart from RTOS companies.

The familiar Windows environment, its adaptability and longevity are all pluses for embedded developers. The Windows form factor and user interface are universally known and understood, making OEMs' introduction of any new system very smooth. However Windows is a general-purpose operating system and cannot deliver the control or hard real-time required for certain types of embedded systems.

RTX is very strong in industries where Windows' level of usability is a priority – where there is a substantial human interaction with a complex embedded system and a need for hard real-time. Windows is selected first, as the way to lower training barriers for the

technicians or operators. *RTX* is then added to deliver the required deterministic control and hard real-time.

Convergence is also a factor that helps set us apart. Embedded applications no longer perform single functions. Today, multiple independent tasks are being consolidated in a single integrated environment. Rather than dozens of DSPs or FPGAs performing individual real-time tasks, customers are selecting multi-core Intel x86 chips, running Windows with *RTX* to combine functions in a unified environment.

The movement to COTS solutions for lower hardware and development costs plays to our strength. Again, we see customers moving away from proprietary boards, DSPs and FPGAs, and microcontrollers and running these real-time tasks on an x86 multicore with *RTX*. Cost of hardware is reduced, along with costs for developers, tool suites, and field maintenance.

Q. What embedded architectures do you support - e.g., Intel architecture, MIPS, ARM, PowerPC, etc.?

A. Our products are designed to work exclusively with X86 chip architectures. This includes both *RTX*, our real-time extension for Windows, as well as *ETS*, our small yet powerful real-time operating system.

Q. What additional software do you offer such as networking, file systems, TCP/IP, security, IDE, GUIs etc.? What about development tools? Are there particular partnerships with other software companies that are especially helpful?

A. Our main software partner is Microsoft. Our *RTX* product serves as a real-time add-on to the Windows product line, with plug-ins for the Visual Studio development suite. As *RTX* is Win32 API compliant, this provides developers the advantage of being able to develop and deploy all within the Windows environment, consolidating costs and minimizing time-to-market. *RTX* also has a product SDK to develop real-time processes. Additional *RTX* tools are available to measure system performance, real-time latencies, platform compatibility, and event tracing.

Q. How are your products sold? What is a typical fee arrangement? Is it royalty free? Per unit royalty?

A. We have a one-time charge for an *RTX* or *ETS* Software Development Kit, maintenance to get support and upgrades, and then a runtime fee for deployed systems. These prices are standard worldwide but variable based on volume of purchase.

Q. Finally, what sort of “try before buy” experiences does your company offer? Are there free demo downloads, webinars, seminars? What web URL’s can you point us to for more information?

A. We offer free evaluation versions of both *RTX* and *ETS* directly from our Web site (<http://www.intervalzero.com/>). We are in the process of developing an *RTX* QuickStart Video, which will be distributed with each evaluation version, to make it easier for developers to get up and running and successful. The *RTX* QuickStart will be available shortly and we have an *ETS* QuickStart Video in the planning stages.

Q. Thank you for this product interview.