

# SELECTING AN EMBEDDED RTOS



## FEATURED INTERVIEW:

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## MICRIUM - RTOS PRODUCTS &amp; SERVICES, 2009

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- Q. First of all, tell us a little bit about yourself and your responsibilities at Micrium.**
- A. As a technical marketing engineer, I am responsible for showing embedded systems developers how Micrium's software can help them meet many of the challenges that their jobs present. Consequently, much of my time is spent writing about this software and creating demonstrations that highlight its capabilities. In addition to preparing newsletters, catalogs, and other material, I organize trade show appearances and set up training sessions that cover Micrium's solutions. Prior to taking on these marketing responsibilities, I spent several years as a software engineer at Micrium, so I have ample first-hand experience with the products that I currently promote.
- 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?**
- *μC/OS-II*, Micrium's world-renowned RTOS, has been a favorite of embedded systems developers for years.
  - Micrium's top-quality file system module, *μC/FS*, is full-featured and highly reliable.
  - *μC/GUI* is Micrium's graphical library. This module, which is written entirely in ANSI C, is a natural choice for engineers whose hardware platforms incorporate a graphical display.
  - Micrium offers bulletproof implementations of a variety of popular communication protocols, including TCP/IP, USB (Device, Host, and On-The-Go), Bluetooth, CAN, and Modbus.
  - *μC/Probe* is Micrium's award-winning visualization tool. Using this unique product, engineers can effortlessly interact with otherwise inscrutable embedded systems.
- Q. What is Micrium'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. By purchasing software modules from Micrium, rather than writing such modules from scratch or obtaining lesser software from a disreputable source, embedded systems

developers can save themselves countless hours of coding and debugging. Although a competent engineer or, more likely, a team of these engineers, could eventually implement the functionality that any one of Micrium's modules offers, such an effort would be a colossal waste of resources. Likewise, the time that a development team would need to set aside in order to master a poorly written or inadequately documented software module would likely be better spent on other tasks. With Micrium's easy-to-use, thoroughly documented software, embedded systems developers can avoid such wasteful efforts and can focus on writing first-rate application code.

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

- A. The hallmark of Micrium's products is impeccable source code. Micrium's engineers follow incredibly stringent coding standards, so the software that they produce is of incomparable quality. Micrium's commitment to well-written source code reflects the philosophies of company president Jean Labrosse, who firmly believes that clean code translates into efficient and dependable software components.

*μC/OS-II*, which is Micrium's popular RTOS, is an ideal example of the benefits of clean source code. Written according to the aforementioned standards, this module has now been certified by both the FAA and FDA for use in safety-critical systems. Although, clearly, such certification is not necessary for every application, *μC/OS-II*'s unique credentials stand as a testament to the operating system's unmatched reliability.

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

- A. *μC/OS-II* is an incredibly versatile module and has been ported to over 45 different CPU architectures. Micrium's other modules likewise support a wide array of hardware platforms. For up-to-date listings of the hardware platforms that these modules support, you can consult the Micrium Web site. There, you will also find a variety of helpful example projects that target these platforms.

**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. In addition to being the originator of a world-class RTOS (*μC/OS-II*), Micrium provides a variety of other high-quality software components, including a GUI library, a file system module, and a wide selection of protocol stacks (TCP/IP, USB Device, USB Host, USB On-The-Go, Bluetooth, CAN, and Modbus). *μC/Probe*, which is an award-winning visualization tool, is another of Micrium's top-notch offerings. Conveniently, any of these modules can be purchased alone or as part of a package that includes additional software. Thus, if, for example, your project requires USB functionality, but not a TCP/IP stack, you needn't purchase a bloated software package that incorporates the latter module.

Micrium's a-la-carte offerings are not limited to embedded software modules; development tools from IAR are also available. IAR, which is one of Micrium's closest partners, has a sterling reputation as a tools provider. IAR's flagship product is Embedded Workbench, a carefully crafted integrated development environment (IDE) that includes a *μC/OS-II*-aware debugger. Numerous example projects that were developed using this first-rate tool chain are available from Micrium's Web site.

While IAR is best known as a tool vendor, a number of Micrium's other close partners are actually consulting firms. Thus, for embedded systems developers who are using Micrium's products, there are plenty of organizations that can provide helpful design services. If your project necessitates such services, Micrium can put you in contact with a consulting firm that meets your needs.

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

A. Micrium's high-quality software modules are (and always have been) royalty-free. Thus, in order to embed one of these modules in a particular product, you would simply need to purchase a license from Micrium. This license would actually be tied to your product, and it would entitle you to make unlimited quantities of that product. If you chose to use one of Micrium's modules in a different product, you would need to purchase an additional license.

**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. Under Micrium's unique evaluation policy, embedded systems developers can actually download  $\mu C/OS-II$ 's source code free of charge. This policy also applies to Micrium's TCP/IP stack,  $\mu C/TCP-IP$ . If you are interested in these two modules or, for that matter, any of the high-quality products discussed in this interview, you should visit Micrium's Web site (<http://www.Micrium.com>), where you can download source code, example projects, and a plentitude of documentation.

**Q. Thank you for this product interview.**