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RTOS Evaluation Project Latest News

This is the latest installment in our series of news flashes from the RTOS evaluation program, which was launched by Real-Time Consult in 1998. In future issues of Real-Time Magazine, we intend to keep our readers informed of new developments in this project.

FROM THE LAB

It's been more than 6 months now since Real-Time Consult officially launched their RTOS evaluation program. It was decided at the outset that the main purpose of this program would be to provide readers with an independent and objective evaluation of the commercially available RTOSs. Furthermore, by defining and adhering to a framework that standardizes everything from the hardware specifications of the target platform to the implementation of the performance tests, this evaluation program is the only source of RTOS related information that provides the industry with the capabilities of making an educated and trustworthy comparison between different products.

The success and acceptance of the RTOS evaluation program to date, has confirmed the industry's need for such an initiative.

Before releasing the reports on the Windows NT real-time extensions, we decided to add another important subject to our framework, which we had overlooked: the "development methodology". After all, the ease and efficiency by which applications can be successfully developed is a compelling argument in the decision of whether or not to use a particular RTOS for a project.

In order to study the "development methodology" in the evaluations of RTX, INtime and Hyperkernel we focused on how efficiently the Windows NT environment can be used during the development of a real-time application. A high degree of synergy with Windows NT is, after all, one of the major incentives that could prompt a developer to choose a real-time extension to Windows NT over a more traditional RTOS.

As far as traditional RTOSs are concerned, the study of the development methodology makes a distinction between two different configurations found in today's commercial products: the host=target solution and the host ≠ target solution. Both configurations have their own set of perks and pitfalls, and require certain tools to be available to make the developer's life easier.

EVALUATION OF QNX 4.25, VXWORKS 5.3.1 AND PSOS 2.2.6 ARE NEXT

After having completed the evaluations of the three Windows NT real-time extensions, it is time for the next round of products to be studied. The following products are currently being evaluated:

- QNX 4.25 from QNX Software Systems Ltd.
- VxWorks 5.3.1 from WindRiver Systems, Inc.
- pSOS 2.2.6 from Integrated Systems, Inc.

Unlike the Windows NT real-time extensions, above products belong more to the category of traditional RTOSs, as they are standalone operating systems. All three products have been around for quite a while now and are among the best known and leading RTOSs in the dedicated systems industry. The evaluation reports of these products will allow people to take a fresh look at the old established RTOSs, and gain a clear perspective on what they may or may not have to offer over newcomers in the field.

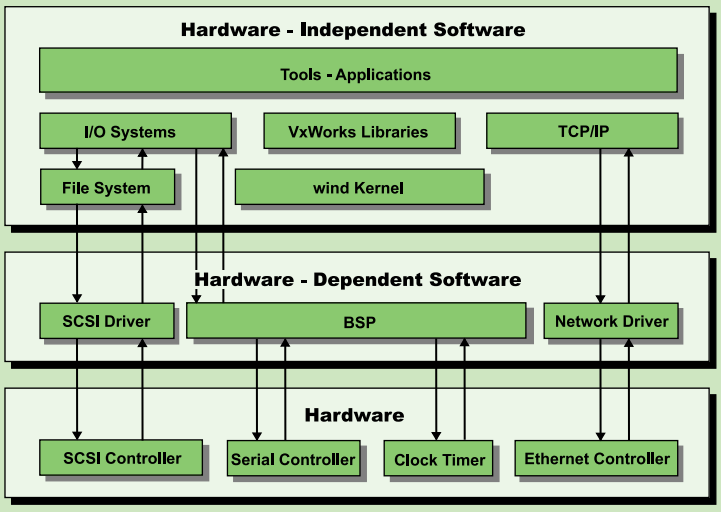

Figure 1. VxWorks 5.3 system architecture

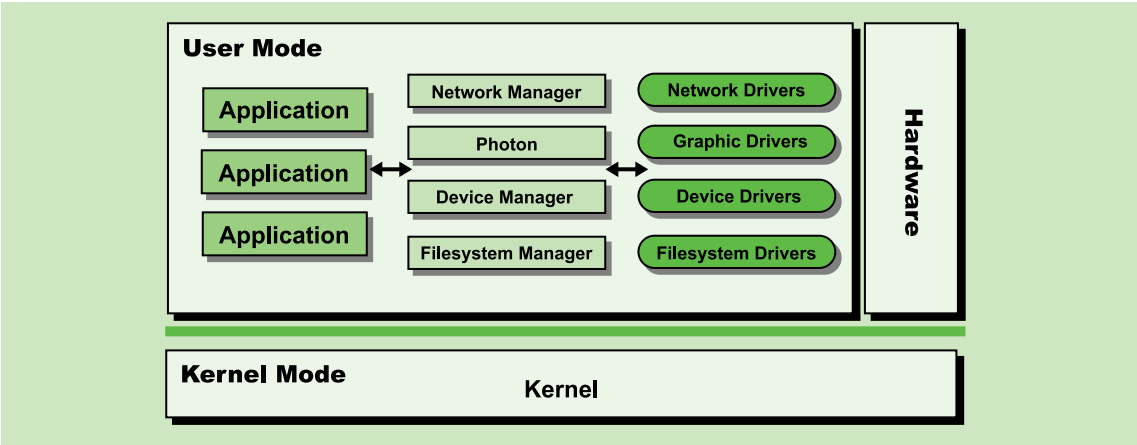

Figure 2. QNX 4.25 system overview

The main difference between the RTOSs currently being evaluated is the fact that QNX is an operating system where host and target are one and the same machine. The development environment and the real-time application run on a QNX machine. On the other hand, with pSOS and VxWorks the host and target are obliged to be two different machines. The development environment runs on a machine with a general-purpose operating system (Windows NT or UNIX), while the real-time application is downloaded for execution to a machine running the dedicated RTOS.

The evaluations of these products are well under way and the reports will be available near the end of March. A comparison report for QNX, VxWorks and pSOS highlighting the decision critical information will also be made available. Pricing information and order forms will be available on our web site (http://www.realtime-info.be).

TARGET PLATFORMS

As mentioned earlier, for all our RTOS evaluations, the same target platform hardware is used. For now, we are using Intel based targets with a Pentium 200 MHz MMX processor.

However, by sticking to one platform, some RTOSs have an unfair advantage over others. For example, QNX is only available for Intel based PCs (and has been for more than 15 years), while both pSOS and VxWorks support a variety of other targets. Moreover, Intel based targets have never been the priority for ISI and Wind River Systems (support for Intel based targets has only been added during the last few years), as their focus is on PowerPC now. This makes that both VxWorks and pSOS have better implementations for 68K and PowerPC than they do for Intel based platforms.

This leaves QNX with somewhat of an unfair advantage over pSOS and VxWorks in our evaluation reports. To level the playing field, we are considering repeating some of the tests on a PowerPC based platform. ■

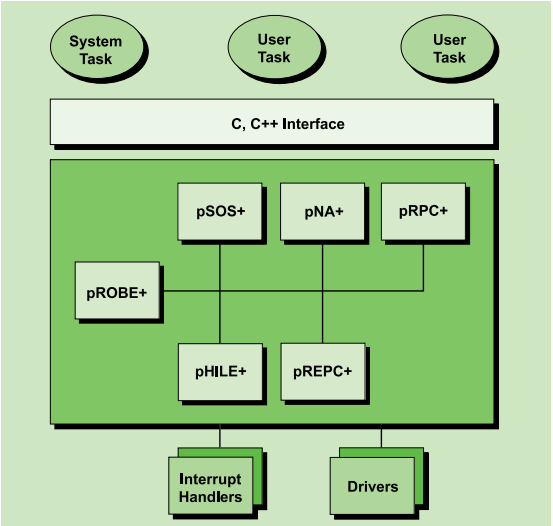

Figure 3. pSOSystem environment

Dr. Martin Timmerman has a degree in Telecommunications Engineering from the Royal Military Academy (RMA) Brussels and received a Doctorate in Applied Science from the Gent State University (1982) in Belgium. In 1983 he transferred to Computer Engineering and set up the System Development Centre (SDC) at RMA. He gives general courses on Computer Platforms and more specific courses on System Development Methodologies. He is a consultant to the Joint Staff of the Belgian Armed Forces in areas concerning Information System Methodologies and CASE tools and he is the Belgian representative in some NATO technical commissions. Outside the RMA, Martin is known for his audits, reviews and seminars, and for his two companies Real-Time Consult and R.T.U.S.I., where he makes use of his considerable knowledge of the Real-Time world. Real-Time Consult is the publishing house responsible for Real-Time Magazine, an International magazine about Real-Time system development. Real-Time User's Support International (R.T.U.S.I.) provides hardware and software support services and is involved in project engineering for real-time systems.

Bart Van Beneden has been with Real-Time Consult since 1998 where he is involved in the RTOS evaluation program of Real-Time Magazine as a project manager. He received his degree in computer science at the Free University of Brussels. Before joining Real-Time Consult, he designed multi-media applications with LaserMedia Inc.