

RTOS Evaluation Project Latest News

This is the first in a series of news flashes on the RTOS Evaluation Project, which was presented to you in the 98Q3 issue of Real-Time Magazine. Each upcoming Real-Time Magazine issue will contain the latest news from the RTOS Evaluations and insights in the results from our RTOS Market Survey.

FROM THE LAB

When you receive this issue, you will find a completely new section dedicated to Real-Time Operating Systems on our web site, the Real-Time Encyclopaedia (<http://www.realtime-info.be>). In this section, we introduce the RTOS Evaluation Project and present the Document Delivery Roadmap explaining which articles and reports can be downloaded right now and which ones are to be released in the near future.

Today you can download for free the articles published in our previous issue on the subject, together with the following documents:

- How to choose a RTOS? This paper explains how you should choose a correctly. It also explains what type of reports we make available and how you should use them
- Report Definition and Test Plan. This paper gives full details about the RTOS evaluation report, the conducted tests and the measurement method.

The document "What makes a good RTOS?", 30 pages long, can be downloaded for free when you order one of our RTOS Evaluation Reports. This document provides you extremely valuable information as it explains in detail the requirements for a RTOS. There are a lot of misconceptions on the topic of real-time. This paper reflects the opinion of Real-time Consult on what makes a good RTOS. We examine techniques that can be found in general purpose operating systems (GPOS) and explain why they can or cannot be used in real-time operating systems (RTOS).

First reports on Windows NT & RT Extensions

As announced in the previous issue, we launch the RTOS Evaluation Project with the evaluation reports of Windows NT and its Real-Time (RT) Extensions.

The evaluation report of Windows NT 4.0 Workstation has been released a week in advance of the other reports to show you what you may expect from a full RTOS Evaluation Report. The report can be downloaded for 29.95 USD, with the report you also receive for free the reference document "What makes a good RTOS?" You will find a preliminary executive summary of this report in the article "Can NT 4 be used as a RTOS?" on page 9 of this magazine.

In addition to the Windows NT 4.0 Evaluation Report, we have made available the Evaluation Reports of RTX from VenturCom, INTIME from Radisys Corp. and

Hyperkernel from Imagination Systems (Division of Nematron Corp.). A comparison report for all three products provides the decision critical information for the managers. All four reports can be ordered separately or in one single package. Price information and order forms are available on our web site.

RTX 4.2 semaphore handling enhanced!

When testing release 4.1 of RTX from VenturCom, Inc, we detected an important bug in the semaphore queue management, which declassified the product for hard real-time applications. VenturCom answered immediately with a new release 4.2 which improves the problematic semaphore queue management discovered in version 4.1 considerably.

To demonstrate how RTX 4.2 has improved over its predecessor, we executed a test that measures the time it takes to release a semaphore and schedule the thread that is thereby released for execution. The test was designed in such way that during one test cycles, the number of threads pending on the semaphore ramps up from 1 to 128.

By looking at Figure 1, which displays the results for RTX 4.1, it can be seen that the measured metric rises proportionally with the number of threads pending on the semaphore. The results for RTX 4.2 on the other hand (displayed in Figure 2) show that there is no such dependency any more. This proves that vast improvements have been made to semaphore queue management in RTX 4.2.

Executive summaries of the evaluation reports of RTX, INTIME, Hyperkernel and the comparison report will be published in one of the next issues of Real-Time Magazine.

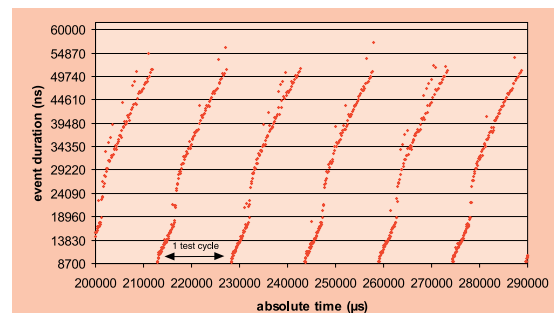


Figure 1. Release + rescheduling time for RTX 4.1

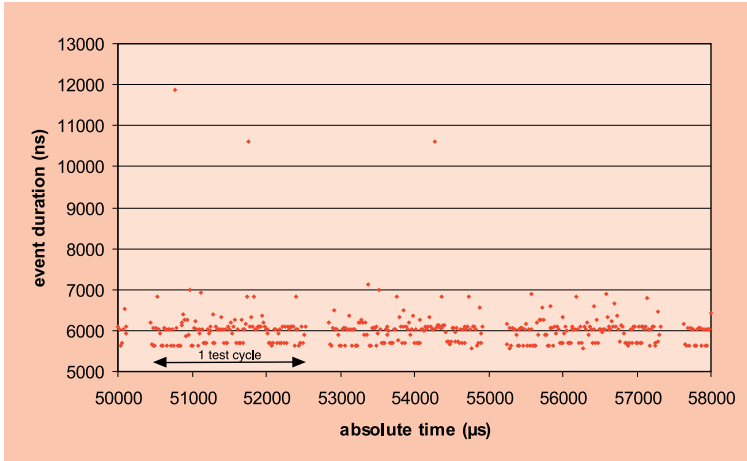


Figure 2: Release + rescheduling time for RTX 4.2

FROM THE MARKET

Our next issue (99Q1) will bring you an update of a market survey we have published three years ago. In 1995 we did ask to the Real-Time Magazine readers to fill in a questionnaire with some questions on RTOS usage. We have done a similar survey again through a questionnaire which, this time, was placed on our web site. Through the questionnaire, people could submit their top 3 of RTOS products to evaluate by us. The survey gave us valuable information on which RTOS products we had to work first.

As a sneak preview, we give you here some first results.

65% is not satisfied with their RTOS!

More than 90% of the participants were using a commercial RTOS.

From those, over 65% want to change their RTOS! This indicates that a majority of the end-users are not satisfied with their product and are looking for another product. As relevant is the fact that the satisfaction ratio has decreased since 1995. In our previous survey, only 50% had the intention to change to another RTOS product. This indicates that there is a clear need for being well informed about these type of products. Our RTOS Evaluation Project wants to answer these needs.

Diluted Market

When maintaining the RTOS Buyer Guide, we see the number of RTOS products growing every day. This means that the market is very diluted. This observation has been confirmed in our survey. Figure 4 shows the breakdown in percentages of RTOS products that the market

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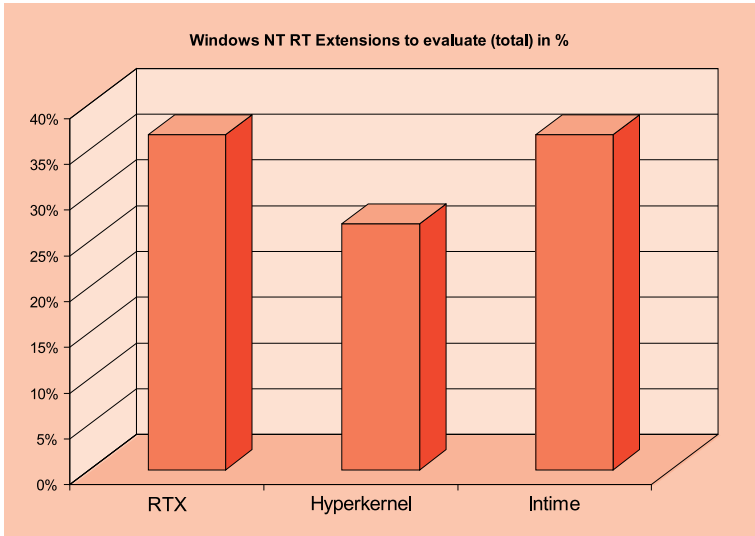


Figure 4: Market Shares of Windows NT RT Extension products in terms of RTOS products people want to see evaluated.

RTOS EVALUATIONS

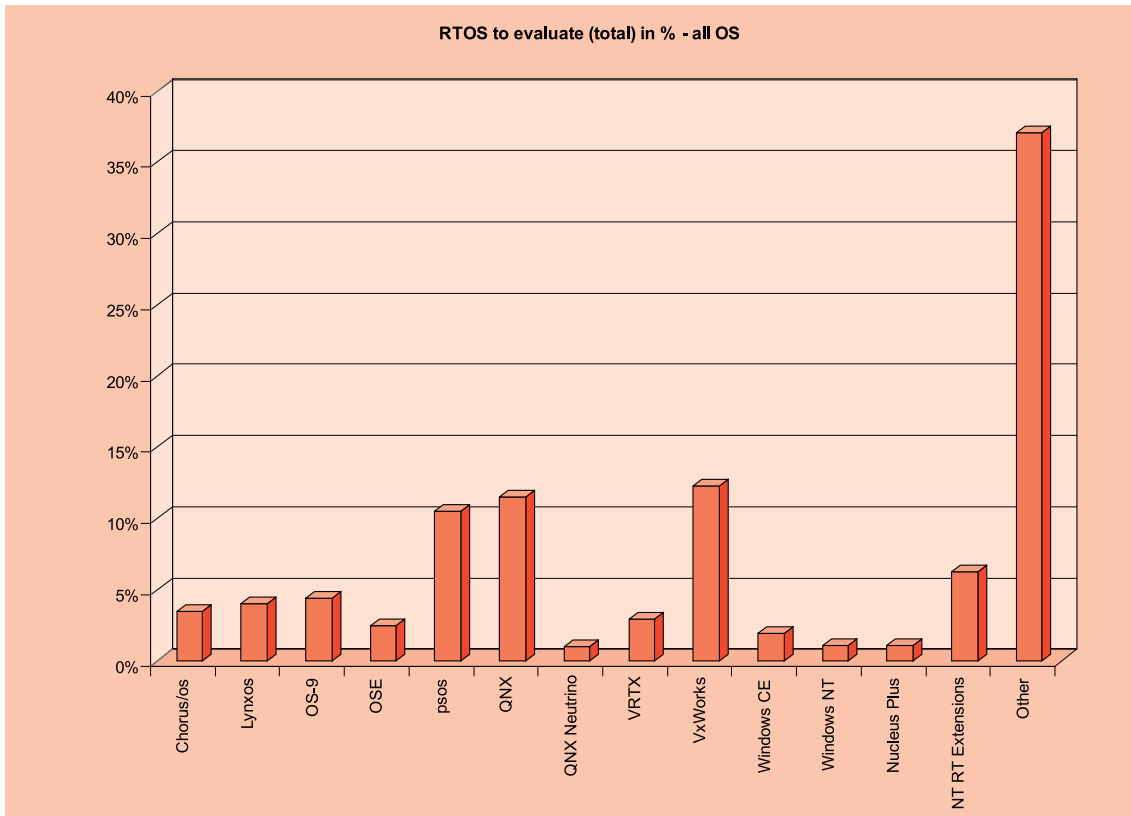


Figure 3: Market Shares of RTOS products in terms of RTOS products people want to see evaluated.

want to see evaluated. This graph gives an indication of the future market shares of those products. 37% of the RTOS market is taken by RTOSs which have each a very small market share. Three products stand out: Tomado/VxWorks (12%), QNX (11%) and pSOS (11%). Very important is the market share of Windows based products, they represent all together about 9% of the total RTOS market! Windows technology is the major new technology in this market. We are convinced that it will play a major role in the coming years.

When looking into the market shares for the Windows NT RT Extensions in Figure 3, we see an equivalent market share for RTX and INTIME, and a smaller market share for Hyperkernel.

For a more detailed analysis we refer to the complete market report, scheduled for the 99Q1 issue of Real-Time Magazine. We will go further into the breakdown by order of preference (which RTOS the market wants to be evaluated in the first, second and third place), giving very valuable market insights, and we will also compare the results with the previous survey conducted in 1995 and draw important tendencies. ■

Dr. Ir. Martin Timmerman graduated in Telecommunications Engineering from the Royal Military Academy (RMA) Brussels and received his Doctorate in Applied Science from the Gent State University (1982). He became the director of the System Development Center (SDC) at RMA, which he created in 1983, and converted himself to a Computer Science Engineer. Presently, he gives general courses on Computer Platforms and more specific courses on System Development

Methodologies at the RMA. Outside the RMA, Martin is known for his audits, reviews, seminars, evaluation reports and feasibility studies he performs with Real-Time Consult. Real-Time Consult is also known for Real-Time Magazine and the Real-Time Encyclopaedia web-site (<http://www.realtime-info.be>) His second company, Real-Time User Support International (RTUSI) 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 1997 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.

Alexander Teetaert graduated in economics at the EHSAL, Brussels in 1993 where he specialised in Marketing Management. He joined Real-Time Consult in 1994 as a Marcom Manager, being responsible for the sales and marketing of the company's consulting and publishing activities. Alexander is dealing with the commercial aspects of the RTOS Evaluation Program of Real-Time Magazine and maintains the relations with the manufacturers.

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