

Dedicated Systems' News

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Wind River Advances Multicore Leadership With Introduction of Latest VxWorks Real-Time Operating System

WIND RIVER

Wind River has announced the immediate availability of VxWorks version 6.7 with significant enhancements that enable device manufacturers to address critical business issues by exploiting the capabilities of the latest multicore processors.

VxWorks 6.7 allows system designers to select the optimal multicore design configuration, asymmetric multiprocessing (AMP) or symmetric multiprocessing (SMP), to deliver next-generation devices with higher performance thresholds while maintaining or reducing power consumption. In addition, VxWorks 6.7 is designed to meet the demands of manufacturers looking to lower device materials costs, consolidate system components, increase legacy re-use, and lower operating expenses, while improving time-to-market for high-quality devices with rich functionality.

Wind River's breadth of support for processors from leading multicore partners such as Intel, Freescale, Cavium, and Raza Microelectronics provides customers the flexibility and choice to optimally design their devices on a range of hardware platforms.

VxWorks 6.7 is supported by a rich set of multicore-aware tools that allow customers to efficiently develop multicore-based devices, providing new capabilities for configuration, build, debug, and simulation. Wind River Workbench development suite is an Eclipse-based collection of tools for debugging, code analysis and testing designed to accelerate time-to-market for developers building devices. In addition, Workbench On-Chip Debugging Edition provides connectivity between the host development environment and the target device via the JTAG or on-chip debugging interface on the device.

Wasn't life simple?



Additional key features and benefits of VxWorks 6.7 include:

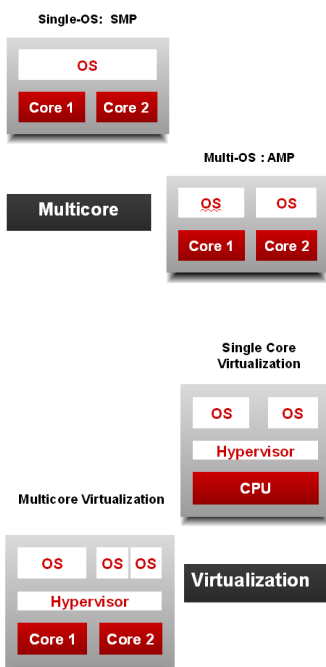
- Enhancements to SMP support for performance optimizations and CPU core affinity;
- Expanded development tools for debug and development of SMP and AMP systems on multicore processors;
- Network offload support, optimized for wire speed packet processing on multicore processors;
- Hardware optimizations for uncore and multicore processors;
- Enhanced capabilities for 4G networking for WiMAX and LTE (Long Term Evolution) applications.

Availability

VxWorks 6.7 is available in the following platforms:

- General Purpose Platform, 3.7;
- Platform for Automotive Devices, 3.7;
- Platform for Consumer Devices, 3.7;
- Platform for Industrial Devices, 3.7;
- Platform for Network Equipment, 3.7.

VxWorks 6.7 Multiprocessing Add-on, an optional package for multiprocessing for VxWorks 6.7, delivers both the symmetric and asymmetric multiprocessing capability in a single component.



RTI Eases Integration of Large-Scale Real-Time Applications with High-Capacity Networked Sensors



Real-Time Innovations (RTI), have announced scalability and performance enhancements to RTI Data Distribution Service, its real-time messaging middleware. These new features significantly ease the integration of large-scale real-time applications with high-capacity networked sensors that are often used in radar and imaging applications.

With these enhancements, systems can now efficiently scale to thousands of sensors and millions of data updates per second, both of which are one to three orders of magnitude higher than with traditional integration middleware. This allows real-time systems—including those designed for air-traffic management; combat management; and command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR)—to analyse more data from more sensors for increased situational awareness and improved tactical decision-making.

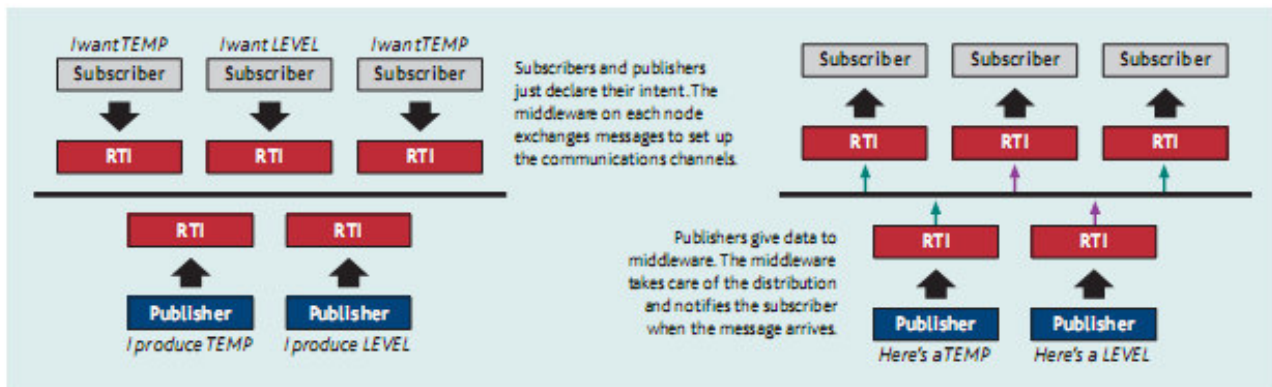
RTI Data Distribution Service eases sensor integration by decoupling the software embedded within sensors from the applications that consume sensor data. RTI Data Distribution Service automatically connects sensors and applications by discovering which sensors and data are available and then distributing data of interest to each application. Because individual software components are loosely coupled, sensors and applications can be added or updated without impacting any other system component, thus maximizing survivability and minimizing long-term software maintenance costs.

This network-centric integration approach makes RTI Data Distribution Service well suited for deployment in dynamic environments such as defence systems. Applications can automatically discover and take advantage of newly connected sensors or adapt to sensors that are no longer accessible—without any software or configuration changes.

RTI Data Distribution Service complies with the Object Management Group (OMG) Data Distribution Service for Real-Time Systems (DDS) application programming interface and the DDS Wire Interoperability Protocol, which is the Real-Time Publish Subscribe (RTPS) protocol. DDS is widely used as an integration standard by major defence and infrastructure programs. It is a mandated standard for publish-subscribe messaging by the U.S. Department of Defence Information Technology Standards Registry (DISR).

The enhanced scalability and performance of RTI Data Distribution Service are derived from two major new capabilities: content-based routing using multicast and batching of small data updates into larger datagrams for more efficient transmission.

With content-based routing, data is partitioned across multicast groups based on its content. For example, a track-management or multi-sensor data-fusion application can group radar tracks by geographic region and assign a unique multicast address to each region. The network switch will then automatically route data updates to the appropriate processing servers based on the multicast addresses that correspond to each server's regions of interest. This enables massive scalability because any application



The publish-subscribe model takes care of channel configuration and data distribution for the application.

or network segment only needs to be able to accommodate data of interest; aggregate throughput is limited only by the switching fabric.

AdaCore Introduces Latest Version of GNAT Programming Studio

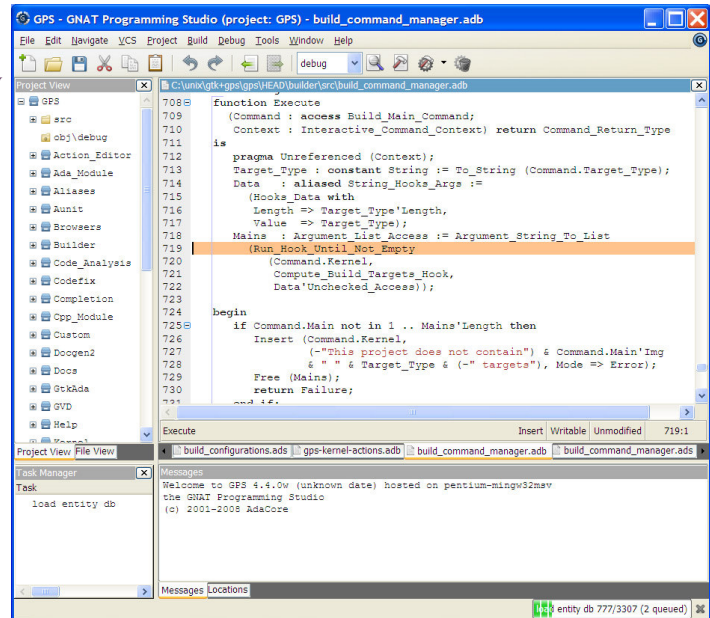


AdaCore has announced the release of GNAT Programming Studio (GPS) 4.3 - an advanced, powerful Ada-oriented Integrated Development Environment (IDE) that accompanies the AdaCore GNAT Pro toolset on most platforms. The new release lets developers simultaneously use multiple versions of the GNAT Pro toolset and features a redesigned builder module as well as an improved documentation generator. By configuring the development environment for several toolchains, a programmer can take advantage of the latest tool improvements while continuing to use a baselined previous version of the compiler.

Among other key features, GPS 4.3 allows upgrading the IDE independent of the base compiler, so that developers can use a single IDE across multiple projects for potentially different target platforms and compilers. The redesigned builder module enables full customization, aiding development flexibility, while the improved documentation generator includes support for predefined and user-defined tags.

New functions in GPS 4.3 include:

- Easy configurability for multiple toolchains
- Redesigned and fully customisable builder module
- Improved documentation generator, including support for predefined and user defined tags
- Enhanced support for gcov (code coverage), gnatcheck (coding standard checker) and compiler switches
- Code completion with new Dynamic Mode
- Improved automatic code fixing
- New plug-ins, including:
 - OS Shell
 - Enhanced SPARK plug-in
 - Show expanded code
 - Initial support for GIT version control system



As with all GNAT Pro components, GPS is distributed with full source code and is backed by AdaCore's rapid and expert online support.

AdaCore Announces GNAT Pro for the VxWorks SMP Capability



AdaCore has announced the availability of GNAT Pro for Wind River's VxWorks 6.6 SMP product. This powerful Ada development environment brings a language that was designed from the ground up to support multi-processing to an operating system that takes advantage of multi-core processors.

Multi-core technology is the next transformative technology for the Device Software Optimization (DSO) industry. With the SMP add-on product installed, VxWorks platforms are enhanced with symmetric multi-processing (SMP) capabilities within the operating system, network stack, and development tools to provide the easiest path to realize the benefits of multi-core technology.

The Ada language is uniquely positioned to take advantage of this new technology. Ada supports multi-processing via its tasking construct. Multi-threading, mutual exclusion, and inter-process communication are handled by the rendezvous mechanism and protected types/objects. The latter provides a reliable and efficient building block for defining semaphores and events for inter-task communication.



Artisan Studio helps Westinghouse Rail Systems reduce SIL4 validation effort by 70%



WRSL has developed equipment compatible with the European Rail Traffic Management System (ERTMS), under the Invensys Rail Group's FUTUR brand. A major element of the ERTMS Level 2 solution is the Radio Block Centre (RBC) which sends "proceed authorities" to trains based on their position and signalling status.

The first application of FUTUR at ERTMS Level 2 is being implemented on the Cordoba to Malaga high speed rail line in Spain. ERTMS Level 2 provides significant benefits in terms of capacity and performance improvements, enhanced safety beyond traditional Automatic Train Protection, and a reduction in operating costs over the railway lifecycle.

WRSL's RBC for ERTMS Level 2 is a SIL4 system implemented in Ada. For the front-end systems design, WRSL drew heavily on the model-driven capabilities of Artisan Studio, the collaborative modelling environment for complex, mission and safety-critical embedded systems and software from Artisan Software Tools. Artisan Studio was used to specify the system requirements of the RBC in a definitive UML model that would drive the software implementation. However, the all-important back-end SIL4 validation process remained a rather complex and somewhat time-consuming manual process.

"Early in the validation process it was clear that, although very thorough and efficient, the manual process would benefit significantly from automation," said Tony Smith, R&D Validation Manager for WRSL. "With four distinct activities in the validation process – flowchart diagram generation, flowchart path analysis, the generation of test cases and report production for test case runs – the manual approach naturally incurred a large time overhead. It also introduced potential risk from human error. The manual process lacked flexibility. It was effectively intolerant to changes made to the original model as even the most innocuous design change could impact any of the validation test cases resulting in a massive validation task."

In seeking to automate the SIL4 validation process for the RBC, WRSL looked to its positive experience with Artisan Studio in defining the original UML model. "Automation was all about using the UML model to its best effect from a validation perspective," continued Tony Smith. "With getting on for 100 Object Sequence and State Diagrams in the model, resulting in the need for around 450 test cases to validate close on 2000 potential paths, Artisan Studio's OLE interface was the key to automating the validation process."

Automatic production of flowchart information for validation use has not only eliminated human error but also the time overhead incurred in the previous manual process. Rather than validation engineers having to manually analyse data previ-



ously encapsulated in Excel spreadsheets, the validator is presented with the information in an easy-to-interpret visual format that provides graphical classification of paths and automatically detects incompatibilities, saving both time and money in development of validation tests. In addition, the use of Artisan Studio allows the Westinghouse Rail Systems team to enforce project wide development policy as the OLE interface allows a separate tool to interrogate the UML model for design errors by comparing diagrams to the design standard that exists for Object Sequence Diagrams.

"WRSL's decision to extend the use of Artisan Studio from requirements specification to system validation is a positive demonstration of our vision of enabling large and often geographically dispersed teams of analysts, systems and software engineers to Work as One™, modelling systems and software for the complete project lifecycle from conception to implementation and on-going support," said James B. Gambrell, CEO of Artisan Software Tools. "The use of Artisan Studio to drive the automated SIL4 validation process for the RBC has given WRSL the ability to better manage design changes and future product versions from the perspective of compliance. With automation, once the process is proven, validation is all about repetition. The automated process makes WRSL far more responsive to change and gives them the confidence that the impact of change is being fully tested. Now, even the subtlest of design changes to improve RBC performance can be handled with relative ease."