

Solutions

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Concurrent iHawk™ On the Move Worldwide

Concurrent continues its tradition as a high performance real-time technology innovator, with its iHawk™ system is being chosen around the globe for an ever-increasing range of time-critical requirements.

Australian Synchrotron Project Embraces iHawk for Data Acquisition



Concurrent's Australian subsidiary announced that it has delivered the first of multiple iHawk™ systems to Major Projects Victoria for the Australian Synchrotron Project (ASP). iHawk powered by Concurrent's RedHawk real-time Linux®, was selected for its highly deterministic response and high performance capabilities to respond to ASP's data acquisition and I/O control (IOC) system requirements. These high performance and distributed IOCs will provide the foundation control system for the synchrotron light beam storage ring.

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Simotion... Driving Forward with iHawk!



Simotion is a system engineering services company based in Munich, Germany. It has been delivering hardware and software engineering in the automotive and radio network domain for almost 20 years. Latest projects include the development of an adaptive light control system, various driver assistance systems and other hardware-in-the-loop applications.

Recently Simotion purchased an iHawk 4-CPU realtime computer system to be used as the simulation host for a driving simulator of a major Bavarian automotive company. Mr. Franz Markus Reich, owner of the company commented, "The superior real-time performance and the compatibility of RedHawk Linux with open standards greatly influenced our purchase decision." In the future additional iHawk systems are planned to be used for simulation applications in the vehicle dynamics and vibration control domain. www.simotion.com

Executive Messages



Gary Brust
Vice President, Worldwide Sales & Marketing

Since joining Concurrent, I've had the pleasure of meeting many members of the company team for both the video-on-demand (VOD) and real-time product lines. In the time I've been on board, I've seen some exciting changes and technology developments that indicate continued growth and expansion across a wide spectrum of markets.

In North America, Concurrent was chosen by Lockheed Martin as the real-time simulation host in the development and build of a new fleet of presidential US101 helicopters. For customers served by the VOD product lines, we continue to strengthen relationships, providing customers with the experience and reliability for which Concurrent is known.

On the technology front, the iHawk Series 880 multiprocessing systems featuring Xeon blade technology are now available. Concurrent has also announced its RedHawk 2.3 release. The VOD product line introduced our MediaHawk IMS (Interactive Media Solution), enabling cable service providers to enhance the navigation experience and drive significant revenue opportunities with content-specific promotion. The company announced its LifeCycle Support Services, enabling support for customers across all product lines and industries.

Innovative developments and business expansions signify expanding opportunities and a vibrant future, and I'm excited to be a part of the Concurrent team.



Warren Neuburger
Chief Operating Officer

Welcome to our latest issue of the Solutions newsletter.

Within the last year, my role at Concurrent has expanded to Chief Operating Officer of the Company. One of the strategic initiatives undertaken was to further unite our company for continued service improvement to our customers and new Channel Partner community worldwide. I'm pleased to say that we have accomplished this goal by uniting our Video-On-Demand and Integrated Solutions divisions, creating product lines represented by a single business entity. This action offers more common technologies, processes, and organizational structures and this "one company" approach further fortifies Concurrent as a supplier for all your time-sensitive computing requirements.

On the international front, in all our products we are experiencing an exciting increase in activity, verifying our product strategy. In late March, Concurrent announced that our iHawk running on real-time RedHawk Linux was chosen by Major Projects Victoria for the Australian Synchrontron Project. This represents enormous potential for innovative advancements in biotechnology, pharmaceuticals, environmental sciences and advanced manufacturing for researchers since the synchrotron will be such a valuable tool in a wide arc of industries.

Our iHawk was also selected by Simotion in Germany for simulation applications in the vehicle dynamics and vibration control domain. Concurrent VOD is clearly the industry leader in Japan with J-Com representing 30% of the Japanese cable market and the choice of European telecommunications carriers.

Real-time high performance computing requirements are growing every day and as a result, Concurrent is expanding our time-critical solutions to meet these exciting opportunities.

Concurrent Introduces iHawk Series 880 Blade Solutions



iHawk Series 880 multiprocessing systems featuring Xeon blade technology are now available from Concurrent. Series 880 blades provide highly scalable, flexible and cost-effective configurations for applications requiring a large number of processors in a small space.

iHawk blades are an excellent choice for distributed data acquisition or simulation. Once a solution is developed using a blade platform, additional processing power can be added in the future without major re-engineering.

Each ultra-slim iHawk processor blade is itself a two or four-CPU Xeon SMP system running Concurrent's RedHawk Linux operating system. Up to fourteen processor or I/O blades can be configured in a single 7U rackmount chassis. iHawk processor blades can be interconnected using Gigabit Ethernet. Series 880 also features Concurrent's Real-time Clock & Interrupt Module (RCIM), ideal for time-critical applications requiring rapid response to external events.

iHawk processor blades offer on-board disk drives along with a range of add-on SCSI drive blade options. Each processor blade can also be configured with two 64-bit 100 MHz PCI-X slots, providing up to fourteen PCI slots per chassis. Series 880 blades are fully supported by RedHawk Linux and Concurrent's NightStar™ tool set.

Processor blades can also be interconnected using fabrics such as InfiniBand or Myrinet for high-speed, low-latency inter-blade communication. Fabric interfaces and supporting cluster protocol software are available via special quotation.

Announcing RedHawk Release 2.3



Concurrent's RedHawk Release 2.3, based on kernel.org version 2.6.9, is now available. It is based on Red Hat® Enterprise Linux® 3.0 Update 4. Highlights of this new release include:

- New iHawk™ platforms supporting new 64-bit Intel® Xeon™ processors MP (multi processor)
- New iHawk packaging options include Blade Servers
- Support for the RCIM II. This includes more real-time clocks, edge-triggered interrupts and programmable interrupts. The real-time clocks are now 32 bits wide. An optional GPS module allows the system's time to be synchronized to GPS time, allowing systems at different locations to have synchronized time
- Process Dispatch Latency (PDL) improvements when using PCIe graphics cards
- Determinism improvements for user-level program execution
- New kernel-level support allows NightTune™ to provide information about physical memory usage on both a system-wide and per-process level
- Inclusion of the latest NVIDIA driver (version 1.0-7167)
- New user-level priority inheritance
- New iHawk hardware guide for optimizing the interrupt priorities of peripherals and physical placement of PCI cards to maximize real-time performance

Customer Solutions



iHawk Selected for US Presidential Helicopter Simulation

Lockheed Martin, as part of the US101 Team, was chosen by the U.S. Navy to develop and build a new fleet of presidential US101 helicopters. Concurrent's high-performance iHawk multiprocessor systems will be used by Lockheed Martin and serve as the real-time simulation host in the building of the fleet.

Concurrent's ImaGen™ image generation (IG) servers will provide image generation services. iHawk multiprocessor systems and ImaGen are powered by Concurrent's real-time RedHawk™ Linux® operating system. The US101 medium-lift helicopter will provide a safe and secure "Oval Office in the Sky" for the President.

The Evolution of Hardware-in-the-Loop Simulation

The Migration to Automatic Code Generation

Hardware-in-the-loop simulation allows engineers to interactively design and test complex controllers in real-time. The heart of a HIL simulation system is the validated software model of the equipment that will be connected to the controller. In the automotive industry, the controller for a powertrain is called the Powertrain Control Module (PCM). In the aerospace industry, the controller for a jet engine is called the Full Authority Digital Electronic Computer (FADEC).

Both of these industries have a need to quickly and efficiently test their control algorithms for best time to market. Originally, controllers were tested on physical prototypes of the final equipment. This was a long, expensive and arduous process. The first step toward HIL simulation was the use of non-real-time software models. These would effectively test out the logical paths, but would not take any timing dynamics into consideration. Though this step was helpful, it still required a long prototype phase in the design cycle.

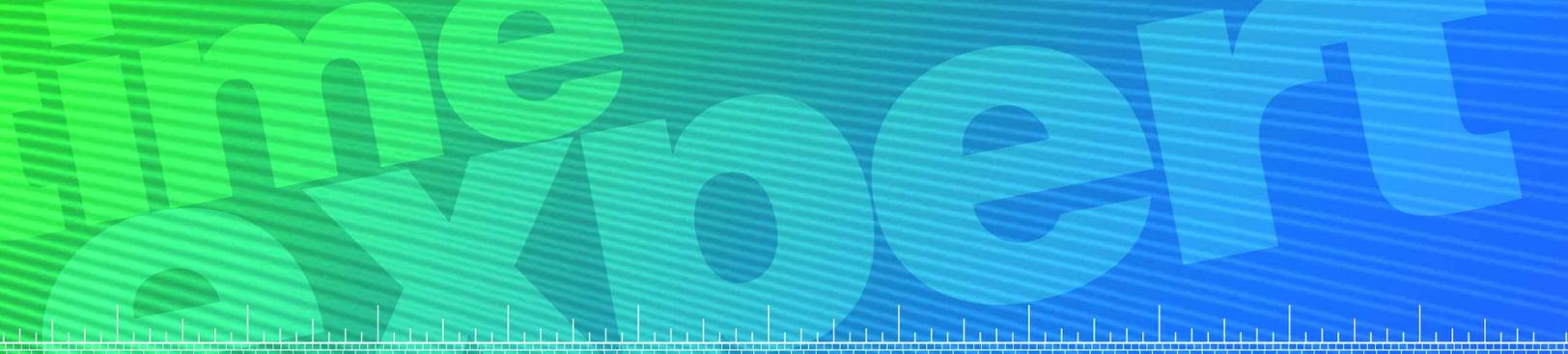
Transitioning the software model from a non-real-time system to a hard real-time system, such as a Concurrent iHawk, allows the engineer to test the controller against a validated software model in real-time, thereby minimizing or possibly eliminating the prototype phase.



The next evolution in HIL software modeling makes use of autocode generators such as The Mathworks' MATLAB®/ Simulink® products. Engineers can select icons that correlate to mathematical libraries and build a block diagram of an algorithm/model. When this has been simulated to their satisfaction, they can automatically generate the software.



Concurrent's RT-LAB RLX allows the running of autocode-generated software on an iHawk, fully synchronized and connected with the I/O required to support a controller such as, PCM or FADEC. Generated software can interact with legacy software modules through the use of Concurrent's Frequently Based Scheduler. Concurrent solutions address all HIL systems, whether based on legacy software or state-of-the-art autocode generators.



RedHawk Linux - Engineered and Tested For Maximized Real-Time Functionality and Reliability

Linux® kernel development happens at an extremely fast pace. To ensure that the latest Linux kernel updates are properly merged into a continually engineered and enhanced Linux kernel environment, Concurrent has developed a comprehensive automated testing framework.

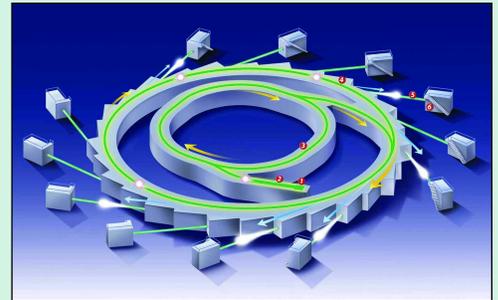


Concurrent generally merges all official kernel.org releases within one or two days of their public availability. Failure to keep up with the changes can result in missing key bug fixes. Even worse, locally developed features can get stranded in time, usable only with outdated kernel versions, requiring significant effort to bring the features up to date and working again with the most recent kernels. To better survive in this chaotic environment, Concurrent has developed a comprehensive testing framework called the “Automated Nightly Test System” or ANTS for short. Every night, ANTS builds the complete RedHawk product from source, performs a complete product installation and then runs component tests, system tests and benchmarks on the newly installed systems, providing concise test reports upon completion. This testing is fully automated and is done in parallel on each iHawk model that is sold and supported by Concurrent, including Intel® Xeon™ and 64-bit AMD Opteron™ based systems. To read the complete white paper, please visit: www.ccur.com/isddocs/ANTS.pdf



Concurrent iHawk™ On the Move Worldwide

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Synchrotron Lightscan Storage Ring

A synchrotron is a powerful machine (about the size of a football field), which uses beams of light a million times brighter than sunlight to probe the physical structure of materials down to the level of atoms and molecules. Synchrotrons are essential tools for research and development in many industries, including: biotechnology and drug design; advanced manufacturing; and medical research and diagnosis; as well as meeting requirements for the Australian Defense Force to extend the life of engine components and provide improved ceramic coatings in military jet engines. The Australian synchrotron will act as an essential new tool for groundbreaking scientific and industrial research.

Take Advantage of Concurrent Expertise Through Classroom and Customized On-Site Training

For the most up-to-date training schedule in PowerMAX™ UNIX® and RedHawk™ Linux®, please visit Concurrent's Training web page at:

www.ccur.com/isd_support_training.asp

Binghamton Simulator Company Expands Simulation Services With Concurrent

BSC is a leading provider of military and commercial flight simulation products and services worldwide. Leveraging BSC's executive team engineering experience dating back to the Link Flight Simulation Division of the Singer Company, BSC has relocated over 200 devices in the past six years for customers worldwide.

The complementary technologies of Concurrent and BSC will provide a highly deterministic simulation solution for the U.S. Air Force's T45 Undergraduate Navigation Training System (UNTS). The T45 UNTS consists of six T45 training complexes and a Trainer Software Support Center. The UNTS is intended to provide intermediate training for navigation and weapons systems operators.

BSC offers a range of simulation support services for all brands of simulation products including spares support, relocation, emergency call-out service, simulator maintenance technician training, facility evaluation and more.

BSC is a Concurrent Channel Partner and offers Concurrent's iHawk™ COTS multiprocessor powered by Concurrent's real-time RedHawk™ Linux® as key components in its simulation solutions development. For more information, please visit: www.bsc.com

Concurrent ImaGen™ Chosen for Aerospace Simulation by Diamond Visionics



GenesisRT (Worldwide Database) Imagery

Concurrent partnered with Diamond Visionics, a leader in innovative simulation technology, to deliver the highest levels of computer-generated image quality and fidelity to a top ten supplier to the U.S. Department of Defense. Diamond Visionics has expertise and products in the three elements of visual systems - Image Generators, Databases and Display Systems.

Diamond Visionics product line features GenesisRT (Worldwide Database) for visual simulation. Customers can rapidly produce high-quality databases directly from source data, thereby enabling changes to be instantly visualized. GenesisRT uses this data at runtime to dynamically generate the visual environment, which dramatically reduces the time, cost and effort of the database development process.

Diamond Visionics has also become an authorized reseller of Concurrent ImaGen Visual Servers and iHawk-related products through membership in Concurrent's Channel Partner Program. By joining the Channel Partner Program, Diamond Visionics offers its customers an integrated image generation solution using Concurrent's ImaGen Visual Server and Diamond Visionics' image generation software products. This integrated solution provides customers with a proven and reliable hardware platform using the latest in COTS graphics engines and dynamically generated image databases. For more information, please visit: www.diamondvisionics.com

News To Keep You Current

Concurrent Launches LifeCycle Support Services™



Concurrent recently announced its LifeCycle Support Services™ program that provides comprehensive, personalized support to customers. The new LifeCycle program sets a new standard for industry-wide service solutions, offering customers access to an expanded array of services to fulfill specific network and operational requirements. From occasional support to dedicated, full-time, on-site assistance and preventive maintenance, the new

program advances Concurrent's commitment to provide customers and partners with the highest possible level of performance.

- LifeCycle Support Services program provides personalized, more responsive support for customers
- Delivers expanded training services to increase reliability and improve productivity
- Offers customizable support tiers, allowing customers to match support programs to their specific network and system requirements
- Ensures maximum service value, empowering Concurrent customers and enabling them to focus on their core business and increase revenue

Concurrent recently combined its divisional Service and Support departments into one unified organization, leveraging nearly 40 years of mission-critical, world class expertise that serves a global customer base across a variety of markets.

Concurrent Introduces ImaGen at Solutions Linux Conference



Concurrent hit the streets of La Defense, Paris with the international introduction of its new visual image generation system called ImaGen at the Solutions Linux conference the week of February 1-3 2005. Concurrent was well positioned at the show as the primary open source real-time Linux provider. While other vendors highlighted technology, Concurrent highlighted solutions utilizing RedHawk Real-Time Linux as the deterministic Operating System for application development. Concurrent's low-latency real-time Linux differentiated our solution. Our team from France displayed interactive simulation flight programs and its real-time development and analysis toolset call NightStar. The SolutionsLinux show was very well attended with over 10,000 attendees interested in Linux.

low-latency



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