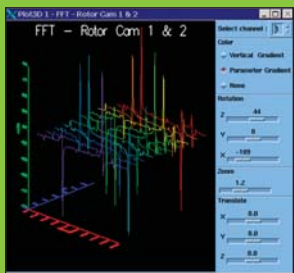


# Solutions

The Newsletter of the Integrated Solutions Division of Concurrent Computer Corporation®

.....Inside.....



Data Acquisition Solutions

PC-IG



Simulation



New  
South American  
Partner



2004 • Vol. 8 • No. 1

## Concurrent First to Deliver Real-Time Linux® on 64-Bit AMD Opteron™

Concurrent is the first global technology provider to deliver 64-bit real-time Linux features and performance on AMD Opteron™ processor-based systems. Concurrent recently delivered its RedHawk™ Linux real-time operating system to a prominent international Concurrent customer for the development of next-generation, 64-bit real-time applications.



*"Concurrent builds upon its tradition as a leading real-time technology innovator with the introduction of RedHawk Linux for the AMD Opteron processor family, offering a range of functionality and industry-leading performance to maximize customer value."*

**Ben Williams, Director of the Server/Workstation Business Segment at AMD**

Based on the 2.6.1 Linux kernel, RedHawk Linux is compatible with the popular Red Hat™ Inc. Enterprise Linux distribution. Concurrent's rich real-time Linux infrastructure delivers the highest levels of deterministic computing ranging from soft to hard real-time where strict timing is critical. Concurrent customers benefit from our extensive real-time features including real-time enhanced RedHawk Linux, application development tools, Real-Time Clock & Interrupt Module, integration services and real-time computing experience. Integrated partner solutions add value in the areas of high-performance graphics, modeling and simulation, test and measurement, data acquisition, vibration and shock test/analysis.

Concurrent systems are deployed in ballistic missile defense, flight and ground vehicle training systems, modeling and simulation, engine test and measurement, and medical applications to name just a few. RedHawk Linux Version 2.1, compatible with Red Hat Enterprise Linux 3, offers support for the AMD Opteron™ and Intel® Xeon™ processors.



**concurrent**

*"Concurrent's support for the AMD Opteron™ platform allows us to address more demanding business needs in our current markets, as well as new markets such as medical imaging, video encoding/decoding, and financial systems that require larger memory addressing and increased processing power."*

**Gary Beerman,  
Director of Marketing,  
Concurrent ISD**

# Executive Messages



Jack Bryant  
President and CEO

Concurrent has a 38-year history of providing complex integrated system solutions to a diverse high-technology customer base worldwide. Concurrent's iHawk servers, coupled with our proven RedHawk real-time Linux operating system, provide the most cost effective computation platform for deterministic computing. We continue to innovate and expand with a full suite of software development tools, our new off-the-shelf graphics and new integrated partner solutions designed to solve the most challenging simulation, data acquisition and process control requirements.

We take life-cycle support very seriously. As a leader in providing integrated deterministic system solutions, Concurrent supports all of your requirements with engineering and system design, integration and support services, professional training and global 24/7 field support services.

At Concurrent it's all about providing fully integrated solutions. We are always looking for new opportunities to solve complex engineering problems through proven, cost effective systems technology. Give us an opportunity to help you solve your challenges!

In these dynamic times, the only thing that remains constant is change! Our challenge is to retain our best elements while evolving to better serve our customers through technology innovation and integration with best-of-breed partner solutions.

During this evolution our employees remain an integral part of our business. For the last 12 years Rob Menzel was a key contributor to Concurrent's success. Rob recently retired and is now happily renovating his home in Stuart, Florida. I wish Rob all the best in his new leisure life.

As the new Vice President of World Wide Sales and Service, I will try my best to carry on the job Rob did so well as motivator, manager and customer advocate, while always wearing a smile. We have a strategy in place that retains the best elements of our past (real-time operating systems, development tools, compilers and long term support) while implementing the latest technology and solutions to ensure our customers the minimal amount of time and cost to implement their programs. I believe we are achieving our goal.



Don Bauer  
Vice-President  
Worldwide Sales and  
Service



Eddy Marchant  
Vice-President  
Engineering

The computer industry continues to move at a phenomenal pace, despite the pressures being applied to Moore's Law<sup>†</sup>. Everyday, it seems to me, we are seeing announcements that continue to shape our industry.

Having recently attended the Intel Developer Forum and heard from the world's leading chip maker what they are planning for the future, it is quite exciting that Concurrent is delivering technology to our customers that is truly on the leading edge.

The announcement that the latest version of RedHawk supports both the Intel IA32 and the AMD Opteron architectures is only the beginning of many new products from Concurrent. Soon we will see PCI-Express improving I/O throughput, CPUs having larger caches, higher frequencies and dual cores meaning that true super-computing power is becoming available at a very competitive price point. All the while we continue to evolve our NightStar tools family with new features, all designed to make developing those time-critical applications even easier for the end user.

<sup>†</sup> Often quoted as a doubling of performance every 18 months, but originally observed as a doubling of the number of transistors per square inch on integrated circuits every year, until later redefined as a doubling of data density approximately every 18 months.

## Raytheon Australia

Raytheon Australia is contracted with the Australian Department Of Defence to produce hardware, software and design support for the Replacement Combat System (RCS) for Australia's Collins-class submarines – and Concurrent's iHawk™ and RedHawk platforms form part of the solution.

Raytheon will develop an interface between the new Combat Control Systems (CCS) MK-2 and the existing sensor suite onboard the submarines. Raytheon found they could guarantee the exacting response requirements between the interfaces only with RedHawk Linux running on an iHawk server.



Six quad-CPU iHawks have been ordered, each with twenty RS-422 ports and six Gigabit Ethernets, to build a complete simulation of the combat system interfaces. Raytheon is in the process of selecting VME single-board computers to implement the interfaces on the submarines.

## Point Magu Naval Air Warfare Center (NAWC)

The NAWC, a division of NAVAIR Weapons Division, is the steward of the ranges, test facilities, laboratories and aircraft necessary to support US Navy fleet requirements. The NAWC at Point Magu is a long-standing Concurrent ISD customer, initially purchasing and deploying Concurrent PowerMAXION™ systems for range testing. NAWC has recently purchased additional PowerMAXION systems in support of their long term range program. Concurrent's real-time expertise and Professional Services were key in responding to NAWC's need to interface the PowerMAXIONS to additional external I/O devices for more modern battlefield simulation.

### About PowerMAXION...

Concurrent's PowerMAXION was the world's first 6U VME, PowerPC™-based, real-time symmetric multiprocessing (SMP) computer system. It supports from one to eight PowerPC 604e processors and offers three levels of memory - cache, local and global. The PowerMAXION is also used by Lockheed Martin Naval Electronics & Surveillance Systems on the Aegis program, the U.S. Navy's most advanced weapons system.

## Alenia Aeronautica

Alenia Aeronautica, a leading Italian aerospace and defense engineering company, has purchased Concurrent's iHawk Intel Xeon graphics system powered by RedHawk Linux for their next generation COTS-based Unmanned Combat Aircraft Vehicle (UCAV) simulation platform.

Alenia Aeronautica plans to use the high-performance iHawk multiprocessor system as the real-time host as well as use the iHawk graphics system as the visual system for their next generation UCAV simulator. Initially designed and tested on a generic PC with standard Linux, Alenia found that the performance of RedHawk was a significant improvement due to its real-time deterministic enhancements.



To reduce engineering time and labor costs, Alenia will utilize Concurrent's NightStar™ tool kit, a standards-based set of real-time software development tools that enable systems builders to maximize productivity in real-time applications development. NightStar tools are specifically designed to allow integrators to find problems early in the project life cycle – and fix them faster.

## Concurrent Locations

### US Offices

Arizona	480.283.1851
California	949.492.2272
Colorado	720.746.1303
Florida	407.384.6500
Michigan	248.355.3596
New Jersey	732.643.2640
New York	607.748.5970
Oregon	503.207.5528
Texas	281.338.6661

### Worldwide Offices

Australia	61.2.9497.1600
China	8610.6200.2526
France	33.1.39.30.52.00
Germany	49.89.856.030
Hong Kong	852.2880.0802
Japan	81.3.3864.5711
Spain	34.91.578.01.25
United Kingdom	44.1.628.513.900

### Integrated Solutions Division Headquarters

2881 Gateway Drive  
Pompano Beach, Florida 33069, USA  
Phone: 954.974.1700 or 800.666.4544

### Concurrent Federal Systems, Inc.

1750 Tysons Boulevard, Suite 405  
McLean, Virginia 22102, USA  
Phone: 703.744.1341

To receive this publication and more Concurrent ISD news and solution information, visit  
[www.ccur.com/subscribe](http://www.ccur.com/subscribe)



To request removal from the mail list, email  
[isd.info@ccur.com](mailto:isd.info@ccur.com)

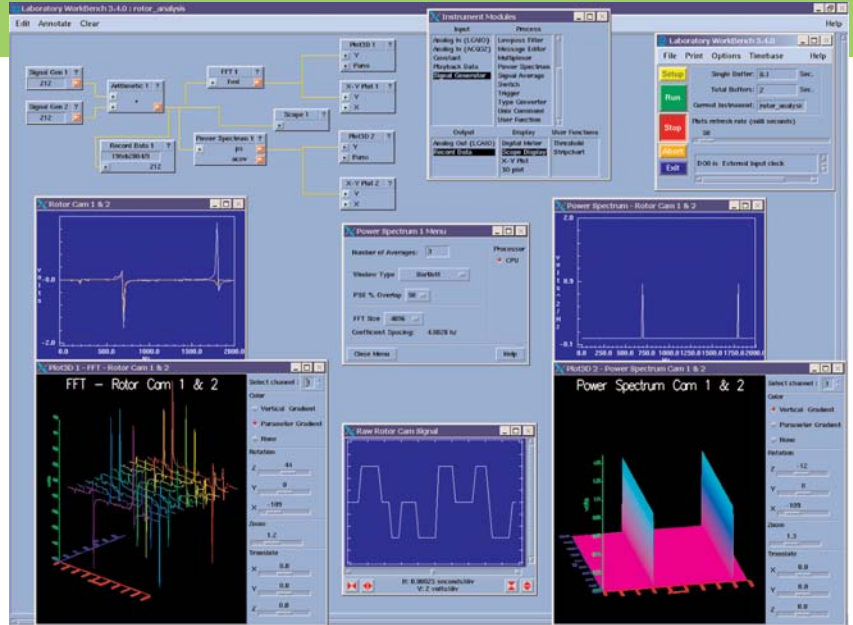
# Product News

## Laboratory Workbench Data Acquisition Without Programming

Laboratory Workbench™ (LWB) is a high-performance GUI data acquisition software package for Concurrent's iHawk Linux-based multiprocessing systems. LWB's easy-to-use, point-and-click interface allows users to acquire, process, display and record analog data without the need for programming.

LWB is an X/Motif-based application that runs under Concurrent's RedHawk Linux real-time operating system. A set of symbolic icons and graphic displays represent data acquisition devices, file operations, signal processing tasks, and display options. With LWB visual controls, users can configure an operational data acquisition and signal processing system on a screen in minutes.

LWB provides a complete data acquisition solution at your fingertips. LWB leaves scientists and engineers free to concentrate on the research experiment at hand by providing a time-saving, visually-oriented, menu-driven data acquisition and processing configuration environment.



## New Quad-CPU Power Hawk To Debut

Concurrent's Power Hawk™ Series 900 family of PowerPC-based VME computer systems will soon have a new member – the Model 940 quad-processor board based on the MPC7457 CPU chip. The new quad board debuts in August 2004 and will be offered at 1.0 and 1.3 GHz, more than double the speed of the previous generation Model 740 quad board. The Model 940 joins the currently available Model 920 dual-CPU and Model 910 single-CPU members of the Series 900 family.

Series 900 is Concurrent's high-performance VME platform for data acquisition and simulation applications. Series 900 systems offer leading-edge PowerPC packaging technology. Dual and quad-CPU Series 900 processor boards are true symmetric multiprocessors (SMP) that run a single copy of Concurrent's PowerMAX™ OS real-time enhanced operating system. CPUs are linked by a high-speed PowerPC processor bus and have direct, cache-coherent access to all on-board main memory. Power Hawk systems include both VME and PMC/PCI I/O and offer optional ruggedized configurations.

The new Model 940 will support up to 2 GB of main memory compared to the 512 MB maximum memory on the older Model 740 quad board. The Model 940 board comes standard with dual integral Gigabit Ethernet, four serial ports and 2 MB of L3 cache per CPU.

Series 900 systems are fully application software compatible with previous generation Power Hawks and legacy PowerMAX OS platforms. User applications can be migrated to Series 900 without modification.



## iHawk Systems To Feature New Improved RCIM

Concurrent's Real-Time Clock & Interrupt Module (RCIM), included with all iHawk systems, is a multifunction PCI card especially designed for time-critical applications. A new enhanced version, called the RCIM II, will soon replace the original RCIM card. On the new RCIM II, the number of high-resolution real-time clocks increases from 4 to 8, the external input and output interrupt lines increase from 4 to 12, and the inter-CPU distributed interrupts increase from 8 to 12.

Concurrent's RCIM provides key functionality for deterministic applications running on a single iHawk system as well as multiple systems. Ideally suited for simulation, data acquisition and industrial control solutions, the RCIM mounts in any standard iHawk PCI slot and is fully supported by Concurrent's RedHawk Linux real-time operating system.

The RCIM provides event synchronization by allowing applications on multiple systems to send interrupts to other CPUs for fast event notification. RCIM



interrupts can be generated by clocks, hardware events or by user software. The RCIM's synchronized clock, now five times more accurate on the RCIM II, can be set by a designated master and read by other systems to provide a common, high-resolution time base for all application processes.

The RCIM II will also offer a new GPS option that allows multiple systems to be synchronized to a common time source without the need for a cable connection. The RCIM II is scheduled to be shipped with iHawk systems starting in June of 2004.



## RedHawk Linux Version 2.1

Concurrent's latest RedHawk Linux operating system, Version 2.1, was released for general availability on March 31, 2004. RedHawk 2.1 is compatible with Red Hat Professional Workstation/Red Hat Enterprise 3, and is the first RedHawk release that supports both AMD Opteron iHawks and Intel Xeon iHawks.

RedHawk 2.1 is based on kernel.org 2.6.1 and contains all of Concurrent's previous Kernel enhancements, plus:

- Priority inheritance on kernel locks
- More support for user-level drivers:
  - the PCI BAR file system – which allows a user to map the PCI registers of a device in a consistent way even when boards get swapped or have their PCI slot moved
  - shmbind() – Our PowerMAX OS interface to attach physical memory or I/O regions to a user-level program via the System V shared memory interfaces
  - shmdefine – Our PowerMAX OS program level interface for creating shared memory regions that are associated with a device and can then be attached via shmbind()
  - example device driver code for connecting an interrupt to a user-level signal handler
- Support for the PCI-to-VME adapter as a standard product

## NightTune for RedHawk Linux

NightTune™, the system and process monitor for PowerMAX OS, is now being ported to RedHawk Linux. NightTune cyclically samples system statistics including those related to processes, disk, network, and CPU usage and displays them using graphs and tables.

NightTune allows you to modify the scheduling attributes of individual processes (policy, priority, and CPU affinity). We've enhanced NightTune to provide CPU shielding control and interrupt CPU affinity control as well.

Look for this newest member of the NightStar tools suite in late June or early July.



# Division News

## Concurrent's Training Facility

Concurrent's Technical Education Center offers both introductory and advanced level courses for all Concurrent Computer Corporation's major software and hardware products.

Classes consist of lectures followed by laboratory exercises designed to augment the lecture material. Students have ample time for review and discussion with the instructor and other students.

For price quotations for on-site and custom courses and further information, please call 1-800-245-6453 or register online.



William "Doc" Holliday  
Principal Instructor  
PowerMAX/Power Hawk products



Michael Duvall  
Principal Instructor  
RedHawk/iHawk products

Ask about the free training course offered with the purchase of Concurrent's NightStar Tools.

## Training Schedule

Apr – Dec 2004

PowerMAX OS System Administration (EW2100)	5/17, 8/30, 11/15
PowerMAX OS Real Time Programming (EW2400)	5/3, 7/12, 10/25
PowerMAX OS Closely-Coupled Systems (EW2500)	On Request
PowerMAX OS Real Time Tools (EW2800)	5/10, 7/19, 11/1
RedHawk OS System Administration (RH3000)	4/12, 8/2, 10/4
RedHawk OS Real-Time Programming (RH3200)	4/19, 8/9, 10/11
RedHawk OS Real Time Tools (RH3400)	4/26, 8/16, 10/18
RedHawk OS Device Drivers (RH3600)	On Request
PowerMAXION System Maintenance (N6400)	6/14, 9/20, 12/6
Power Hawk 600 Series System Maintenance (N4600)	6/7, 9/13, 11/29

Check complete course listings at [www.ccur.com/isd](http://www.ccur.com/isd)

## Events

### Solutions Linux

Concurrent exhibited at the Solutions Linux show in Paris during the week of February 3-5. The Solutions Linux show was manned by the sales and analyst team in France and by US marketing. Concurrent demonstrated solutions that focused on flight and HIL simulation, and included a specific demo that compared real-time performance of standard Red Hat Linux with Concurrent's RedHawk Linux. Concurrent's presence at the expo proved that Linux-based solutions are being utilized to solve mission and time critical needs today.

### PC Scene Generation Conference

In mid-February, Concurrent was invited to attend a PC Scene Generation Conference at Eglin Air Force Base. This conference brought together researchers and COTS systems providers, such as SGI, HP, IBM, NVIDIA, ATI and Quantum 3D, to discuss requirements for using clusters of PCs to perform physically accurate modeling of the physical phenomena associated with the National Missile Defense System.

Steve Brosky, Concurrent's Chief Scientist, gave a half-hour presentation to the group and was asked to stay over on the last day of the conference to give a two-hour tutorial on Linux and real-time. It was clear throughout the conference that RedHawk is considered the defacto standard for real-time Linux by those working in this area of PC scene generation.

### I/ITSEC

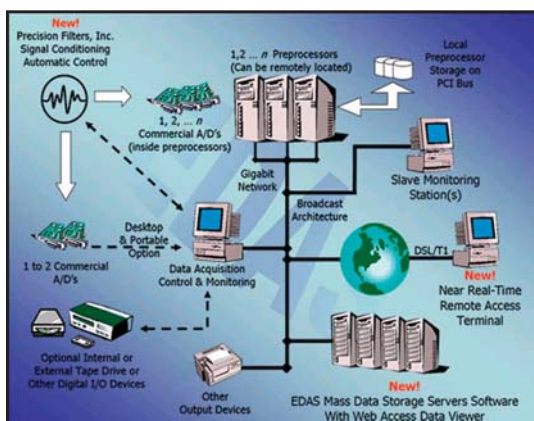
Concurrent soared through the I/ITSEC show with a hang glider demo that kept a steady stream of people at the booth. Using a partner's multichannel graphics cluster and an iHawk system, visitors were immersed



in a virtual world of hang gliding. Additional demos running at the booth focused on complete solutions in target market areas. With around 15,000 people attending this year's event, I/ITSEC is an event not to be missed.

## Concurrent Offers EDAS Rotational Vibration Testing and Analysis Software

EDAS software on iHawk systems provides a powerful solution for rotational machinery applications, specifically turbine engines. Companies like Boeing, Bosch, General Electric, NASA, Pratt & Whitney, Rolls-Royce, Siemens and Westinghouse are successfully using EDAS products and can now use them on RedHawk Linux platforms.



Concurrent once offered similar software called Cranfield Data Systems SPAG on Series 7000 UNIX-based systems. EDAS software now provides an enhanced replacement product for existing SPAG customers and allows Concurrent to better serve this market area.

In addition to high-performance data acquisition software, EDAS offers GageMapII which interfaces to popular finite element packages such as ANSYS, ABAQUS and NASTRAN to visualize modal deformation, vibratory mode interactions, stresses, strains and even high-cycle fatigue margins. Another EDAS product called DatWizardII can quickly convert large amounts of vibration data into useful information by scanning data files and cataloging peak responses based on customer-tunable parameters and limits.

EDAS products are available now.



## BL Brasil Brings iHawk to South America



BL Brasil, an established technology provider in Brazil, has strategically partnered with Concurrent to bring RedHawk Linux on the iHawk platform to the Brazilian market.

BL was founded in 1995 and has since represented several hi-tech companies in the Brazilian and South American markets. Concurrent selected BL Brasil as its representative based on their strong customer base and an excellent professional relationship.

BL Brasil will market the complete range of solutions from the Integrated Solution Division. This alliance will allow Brazilian customers to benefit from leading-edge technology locally.

## Concurrent and ORAD Sign Agreement to Deliver PC-IG Linux Solutions for the Simulation Market

Concurrent and ORAD have partnered to provide solutions for demanding high-end image generation requirements. Concurrent's new PC Image Generation systems, being announced at the ITEC show in London April 20-22, already supports NVIDIA FX3000G graphics cards with genlock and frame lock capabilities for high performance IG. By partnering with ORAD, Concurrent can now solve the most demanding IG requirements by integrating the ORAD DVG. The DVG works in conjunction with select COTS graphics boards by controlling a board's clock. This allows the DVG to take the output of a single graphics board and combine it with a number of boards to increase the performance of the final output. The end result is dramatically improved 3D texturing and geometry performance for unprecedented levels of image realism.



# Before it's REAL, it's



**Real-Time, Real Fast, A Real Solution**

- Real-Time Linux® for determinism
- Optimized Linux for Intel® Xeon® & AMD Opteron™
- Linux/COTS-based IG for added value
- Integrated Linux solutions & services

iHawk™ systems powered by RedHawk™ Real-Time Linux®



Before the mission is real, leading Aerospace and Defense contractors choose Concurrent's iHawk as their platform for simulation and training. Contact us today to learn why!

**For an on-site iHawk™ demo system, visit [www.ccur.com/c3](http://www.ccur.com/c3)**

**iHAWK** customers include:

- Boeing • DaimlerChrysler • Ford
- General Dynamics • Lockheed Martin • Mitsubishi
- Raytheon • Saab • U.S. Marines • U.S. Navy and many more!


©2004 Concurrent Computer Corporation

AUSTRALIA • BRAZIL • CHINA • FRANCE • HONG KONG • JAPAN • KOREA • GERMANY • UK • USA  
[www.ccur.com/c3](http://www.ccur.com/c3) or e-mail [isd.info@ccur.com](mailto:isd.info@ccur.com)  
 See us at ITEC Booth 602




See our ad in *Military Simulation & Training* magazine

PRSR STD  
 US POSTAGE PAID  
 FT. LAUDERDALE  
 FLORIDA  
 PERMIT NO. 2358

Address Correction Requested  
 Return Postage Guaranteed  
 2881 Gateway Drive  
 Pompano Beach, Florida 33069, USA  


Concurrent Computer Corporation and its logo are registered trademarks and iHawk, RedHawk, NightStar, NightTune, PowerMAX and Power Hawk are trademarks of Concurrent Computer Corporation. All other trademarks are the property of their respective owners. RTLit-0018 0404 7000

 **Partner Highlighted**  
 South American

 **Data Acquisition**  
 Solutions

 **Opteron 64-bit**  
 Technology

The Newsletter of the Integrated Solutions Division of Concurrent Computer Corporation ©  
*Integrating high performance technology solutions worldwide*

# Inside Solutions