



## 2008 SUN LABS OPEN HOUSE

**Onsite at  
MPK 16  
First Floor**

**Wednesday,  
April 9, 2008  
10 AM to 5 PM**

**Thursday,  
April 10, 2008  
10 AM to 5 PM**

**16 Network Circle  
Menlo Park, CA 94025**



<http://sunlabs.sfbay/openhouse>

# SUN TECHNOLOGY DEMOS QUICK REFERENCE



Room #	Demo Title	Room #	Demo Title
1280	Crossbow Network Virtualization and Resource Control	1431	Sun SPOT — eDAQ
1281	Bug and Security Vulnerability Checking with Parfait	1431	Project Squawk
1284	Project Live*: Software To Go	1830	Project Wonderland
1470	Project Caroline: Platform as a Service	1840	Project Aura
1410	Project Sedna: Next Generation Switch	1860	The Lively Kernel Project — Turning Web Programming Upside Down
1410	OpenSPARC™ on FPGA	1930	Workload Characterization
1431	Solarium — Sun™ SPOT Management System	1522	The Electric VLSI Design System
1431	Sun SPOT — Emulator	1690	OMS
1431	Sun SPOT — Yggdrasil	1672	Java™ Card

# TALKS QUICK REFERENCE: Wednesday, April 9



TIME Weds	Room 1577 MPK14 Sun BTV Studio	Room 1461 Palace of Fine Arts	Room 1547 MPK14 Sequoia	
1:00-1:45	<b>Sun Small Programmable Object Technology (SPOT)</b> <i>Roger Meike, Arshan Pourschi, Vipul Gupta, David Simmons, Pete St Pierre, Randy Smith, Eric Arseneau, Bob Alkire, Ron Goldman, Derek White</i>	Unsecuring the Internet: A New Government Policy? <i>Susan Landau</i>		
1:45-2:00		Break	Break	
2:00-2:45		Project Aura <i>Paul Lamere, Steve Green, Jeff Alexander</i>	Sun SPOTs Hands On Lab <i>David Simmons, Simon Ritter</i>	
2:45-3:00		Break	Break	
3:00-3:45		An Open Fortress <i>Guy Steele, Eric Allen</i>	Project Live* <i>Olaf Manczak, Eric Lalonde</i>	
3:45-4:00	Break	Break		
4:00-4:45	Rock's Transactional Memory and How to Exploit It <i>Mark Moir</i>	Project Squawk <i>Eric Arseneau, Derek White</i>		

# TALKS QUICK REFERENCE: Thursday, April 10



TIME Thurs	Room 1577 MPK14 Sun BTv Studio	Room 1461 Palace of Fine Arts	Room 1668 Grace Cathedral	Room 1547 MPK14 Sequoia
10:00-10:45	10-10:15 Welcome to the 2008 Sun Labs Open House <i>Greg Papadopoulos</i>	10-10:15 Welcome to the 2008 Open House (overflow room) <i>Greg Papadopoulos (on video only)</i>		10-10:15 Welcome to the 2008 Open House (overflow room) <i>Greg Papadopoulos (on video only)</i>
10:45-11:00	10:15-12:00 Project Caroline	Break	Break	Break
11:00-11:45	<i>Richard Zippel, Robert Scheifler, John McClain, Thomas Vinod Johnson</i>	The Lively Kernel Project — Turning Web Programming Upside Down <i>Dan Ingalls, Antero Taivalsaari</i>		
12:00-1:00	Lunch Break			
1:00-1:45	Project Darkstar	The Future of the Data Center <i>Subodh Bapat</i>	Securing Data At-Rest: Make the Best of Encryption and Key Management <i>Cynthia McGuire</i>	Sun SPOTs Hands On Lab <i>David Simmons, Simon Ritter</i>
1:45-2:00	<i>Karl Haberl, Tim Blackman, Seth Proctor, Jennifer Kotzen, Jonathan Kaplan</i>	Break	Break	
2:00-2:45		Truly User-Centric PKI <i>Radia Perlman</i>	Scalable Switch Architectures <i>Wladyslaw Olesinski</i>	
2:45-3:00	Break	Break	Break	Break
3:00-3:45	Media Technology Talks 3:00 #1 Conditional Access with Java Card and DReaM-CAS <i>Sebastian Hans</i>	Virtual Networks and Network in a Box <i>Sunay Tripathi, Kais Belgaied, Markus Flierl</i>	Growing the Fortress Programming Language by Example <i>Sukyong Ryu</i>	
3:45-4:00	3:30 #2 OMS — Overview <i>Gerard Fernando, Kelly Kishore</i>	Break	Break	Break
4:00-4:45	4:00 #3 OMS — Business Perspective <i>Rob Glidden</i>	MiRTLE: Using Wonderland to Create a Mixed Reality Teaching Environment <i>Bernard Horan</i>	Building a File System on the Celeste File Store <i>Glenn Skinner</i>	

## Room 1577 MPK14 - Sun BTV Studio

Time	Talk Title	Speaker
1:00	Sun Small Programmable Object Technology (SPOT)	Roger Meike, Arshan Poursohi, Vipul Gupta, David Simmons, Pete St Pierre, Randy Smith, Eric Arseneau, Bob Alkire, Ron Goldman, Derek White
	This set of talks presents an update on Project Sun SPOT ( <a href="http://www.sunspotworld.com">www.sunspotworld.com</a> ), a small, battery operated, wireless device running the Squawk Java Virtual Machine (VM) without an underlying OS. Completely open sourced, the Sun SPOT hardware and software research platform provides a unique opportunity to the embedded development community to apply and expand this technology in new and exciting ways.	
2:45	Break	
3:00	An Open Fortress	Guy Steele, Eric Allen
	Two years ago, the Fortress Project at Sun Labs was turned into an open source project: Daily revisions to the Fortress code base have been publicly visible, external developers have been granted commit privileges, and many technical discussions on the direction of the implementation have been conducted openly and with participation by external developers. This month, Fortress has taken its next leap forward with the release of Fortress 1.0: The first specification of the language that has been synchronized with the implementation. With this release, the Fortress community is better able to evaluate the design of new features, users are better able to use them, and developers are better able to contribute to the implementation, as they can now work off of a stable and well-specified code base. In this talk, we review the benefits and challenges we have had in working on Fortress in the open, and our plans for growing the language in the future.	
3:45	Break	
4:00	Rock's Transactional Memory and How to Exploit It	Mark Moir
	Overview of Rock's hardware transactional memory feature and presentation results of our preliminary exploration of how to exploit it; this work has been done using the Adaptive Transactional Memory Test Platform simulator we have built.	

## Room 1461 MPK16 - Palace of Fine Arts Conference Room

Time	Talk Title	Speaker
1:00	Unsecuring the Internet: A New Government Policy?	Susan Landau
	Surveillance and security: what are the real issues in this debate—and how does this lead us to a solution?	
1:45	Break	
2:00	Project Aura	Paul Lamere, Steve Green, Jeff Alexander
	Project Aura is an open recommendation system that makes good recommendation possible for everyone—for companies that don't have a user base the size of Amazon, Netflix or Google, and for products that don't have the popularity to make it out of the long tail. Aura is a hybrid recommender system that combines the best aspects of collaborative filtering with content-based recommendation technology to generate recommendations even without large amounts of user data.	
2:45	Break	
3:00	Project Live*	Olaf Manczak, Eric Lalonde
	Project Live* [live-star] explores a new approach to software distribution and configuration of enterprise systems. This new approach combines the simplicity and ease-of-use of the firmware model, ubiquitously used for single-vendor single-purpose software in consumer electronic devices, with the modularity and flexibility of customization necessary in the multi-purpose, multi-vendor enterprise world.	

Time	Talk Title—Room 1461 MPK16	Speaker
3:45	Break	
4:00	Project Squawk	Eric Arseneau, Derek White

Project Squawk is about extending the reach of Java technology into more and smaller things. Come find out how we intend to enable manufacturers to leverage the power of Java to build toys and physical things, beyond desktop and phone-based applications. This talk will go over the design ideology behind Squawk, progress made in the past year, and what we are planning for the coming year.

## Room 1547 MPK14 - Sequoia Conference Room

Time	Talk Title	Speaker
3:00 - 5:00	Sun SPOTs Hands On Lab (HOL) Registration Required	David Simmons, Simon Ritter

The Hands On Lab will be a chance for software developers (Java developers) to see how easy it can be to do hardware development for Wireless Sensor Networks. Participants will be led through attaching both sensors and actuators to a Sun SPOT and developing an application for them to communicate wirelessly such that the sensor input causes action remotely.

## Room 1577 MPK14 - Sun BTV Studio

Time	Talk Title	Speaker
10:00	Welcome to the 2008 Open House	Greg Papadopoulos
10:15	Project Caroline	Richard Zippel, Robert Scheifler, John McClain, Thomas Johnson
	<p>Project Caroline is a hosting platform for development and delivery of dynamically scalable Internet-based services. The platform comprises a programmatically configurable pool of virtualized compute, storage, and networking resources.</p> <p>Project Caroline helps software providers develop services rapidly, update in-production services frequently, and automatically flex their use of platform resources to match changing runtime demands.</p>	
12:00	Lunch Break	
1:00	Project Darkstar	Karl Haberl, Tim Blackman, Seth Proctor, Jennifer Kotzen, Jonathan Kaplan
	<p>Overview and current status of Project Darkstar, Sun's Gaming Server.</p>	
2:45	Break	
3:00-4:45	<b>THIS BEGINS A SET OF 3 MEDIA TECHNOLOGY TALKS</b>	
#1	Conditional Access with Java Card and DReaM-CAS	Sebastian Hans
	<p>To address the need for separable security of conditional access in the digital television industry, a combination of the next generation Java Card and DReaM-CAS is proposed.</p>	
3:30 #2	OMS—Overview	Gerard Fernando, Kelly Kishore
	<p>The importance of royalty-free technologies has become more apparent due to the recent IP litigations in the media technology industry. OMS addresses this need through a methodology which will be discussed. This is a collaborative effort with Sun Labs, Java CSG, VIS Engineering and Sun Legal to develop a software media stack that can be used by Sun under royalty-free terms.</p>	
4:00 #3	OMS—Business Perspective	Rob Glidden
	<p>Today's media players and content platforms often have little choice but to rely on either royalty-bearing or proprietary technologies, standards or codecs. "Royalty free" has many compelling benefits as a better foundation for an open media Web, and OMS offers key contributions to making a complete, open royalty-free media system a reality.</p>	

## Room 1461 MPK16 - Palace of Fine Arts Conference Room

Time	Talk Title	Speaker
10:00	Welcome to the 2008 Open House (overflow only, from Sun BTV Studio talk)	Greg Papadopoulos (on video only in this room)
10:45	Break	
11:00	The Lively Kernel Project—Turning Web Programming Upside Down	Dan Ingalls, Antero Taivalsaari
	<p>The Lively Kernel Project uses a dynamic language kernel to turn the world of web programming upside down, and bring the same kind of simplicity, generality and flexibility to web programming that we have known in desktop programming for thirty years.</p> <p>This new web programming environment, called the Lively Kernel, is based on the JavaScript™ programming language, a desktop-style graphics architecture (based on the Morphic graphics framework), and Ajax-style asynchronous networking support.</p>	
12:00	Lunch Break	
1:00	The Future of the Data Center	Subodh Bapat
	<p>Data centers are getting bigger, denser, and hotter. Data centers now run a critical part of the national infrastructure—critical data flows for commerce, banking and security all flow through data centers. This talk will explore the future of data centers, identifying the critical parameters that are important to data center growth, as well as the innovative techniques being considered for current and future data center design. This talk emphasizes the importance of considering server architecture, network topology, virtualization, power, and cooling together in a holistic way while designing the data center of the future.</p>	
1:45	Break	
2:00	Truly User-Centric PKI	Radia Perlman
	<p>Today's username/password scheme for authenticating on the web is horrible. Why can't we do straightforward authentication using public keys? This talk describes some approaches being advocated in the industry, including federations of service providers and identity providers, and suggests instead an approach that eliminates the necessity for extra parties such as identity providers. It also eliminates, in most cases, the necessity for CAs.</p>	
2:45	Break	
3:00	Virtual Networks and Network in a Box	Sunay Tripathi, Kais Belgaied, Markus Flierl
	<p>Using Crossbow Network Virtualization, users can create a real network comprising of switches, routers, firewalls and hosts on their laptop itself (network in a box). There is no simulation. Users can run real apps which will send real packets helping them learn/experiment with IP configuration and routing and debug real bottleneck and performance issues in a whole new manner without needing access to a physical network or devices. In addition, users can use the same technology to build virtual networks on their existing physical networks where the virtual networks will have full security and interference isolation from each other.</p>	
3:45	Break	
4:00	Project MiRTLE: Using Wonderland to Create a Mixed Reality Teaching Environment	Bernard Horan
	<p>Project MiRTLE is a collaborative project between Sun Labs and the Digital Lifestyles Center at the University of Essex (UK) to produce a Mixed Reality Teaching and Learning Environment for deployment at Shanghai Jiao Tong University. We will discuss project background, objectives and project plan, provide details of its current status and provide a demo of its use, either live or by video.</p>	

## Room 1668 MPK16 - Grace Cathedral Conference Room

Time	Talk Title	Speaker
1:00	Securing Data At-Rest: Make the Best of Encryption and Key Management	Cynthia McGuire
	A description of technologies to securely manage data throughout its lifecycle using existing encryption techniques and a unique key management system. We will explore how encryption and key management may be combined with storage product software and hardware to offer an end-to-end solution for managing, securing and assuredly deleting data at-rest.	
1:45	Break	
2:00	Scalable Switch Architectures	Wladyslaw Olesinski
	This will be a presentation of a novel switch architecture and scheduler suitable for large, single-stage switches with multi-terabit-per-second throughput and hundreds of ports.	
2:45	Break	
3:00	Growing the Fortress Programming Language by Example	Sukyoung Ryu
	We present examples which show the "Growing a Language" idea realized in the Fortress programming language.	
3:45	Break	
4:00	Building a File System on the Celeste File Store	Glenn Skinner
	This talk will describe experiences in building a conventional file system on top of the distributed, fault tolerant Celeste file store. Celeste is an unconventional substrate for a file system. This talk will focus on the challenges it presents to a file system implementor.	

## Room 1547 MPK14 - Sequoia Conference Room

Time	Talk Title	Speaker
10:00	Welcome to the 2008 Open House (overflow only, from Sun BTV Studio talk)	Greg Papadopoulos (on video only in this room)
1:00 - 3:00	Sun SPOTs Hands On Lab (HOL) Registration Required	David Simmons, Simon Ritter
	The Hands On Lab will be a chance for software developers (Java developers) to see how easy it can be to do hardware development for Wireless Sensor Networks. Participants will be led through attaching both sensors and actuators to a Sun SPOT and developing an application for them to communicate wirelessly such that the sensor input causes action remotely.	

Room #	Demo Title	Demo Team
1280	<b>Crossbow Network Virtualization and Resource Control</b>	<b>Kais Belgaied, Ventu Iyer, Sunay Tripathi, Markus Flierl, Michael Lim</b>
	A demo which takes a physical network and transforms it into virtual network using Crossbow and Zones.	
1281	<b>Bug and Security Vulnerability Checking with Parfait</b>	<b>Cristina Cifuentes</b>
	Parfait is a static program analysis tool that checks for implementation errors (bugs) in C source code. Parfait is designed for scalability (to analyze millions of lines of code in a runtime-efficient manner), accuracy (report on fewer false positives), and to provide support for security vulnerability analysis. The main focus of our analysis has been on buffer overflow and static taint analysis; we demo these areas using synthetic benchmarks created by the bug-checking community, as well as OpenSolaris™ utilities.	
1284	<b>Project Live*: Software To Go</b>	<b>Olaf Manczak, Eric Lalonde</b>
	<p>Project Live* [live-star] explores a new approach to software distribution and configuration of enterprise systems. This new approach combines the simplicity and ease-of-use of the firmware model, ubiquitously used for single-vendor single-purpose software in consumer electronic devices, with the modularity and flexibility of customization necessary in the multi-purpose, multi-vendor enterprise world.</p> <p>Live* pushes the traditional installation process back to the factory. Software is distributed in the form of pre-installed immutable file system images that contain major software components, for example, an operating system, a database or an application server. At boot time Live* dynamically composes a collection of such modules into a single virtual software environment. Using a simple file system virtualization technology, Live* makes this composition entirely transparent to all existing software.</p> <p>Also, similar to software in consumer electronics, Live* consolidates the system customization and configuration settings into a repository separate from the original software. To minimize changes to the existing software, Live* dynamically generates a virtual appearance of the conventional configuration files at boot time.</p> <p>The Live* technology extends the concept of software distribution in the form of ready-to-run images (e.g. LiveCDs or virtual appliances), with the true modularity and flexibility of customization. Live* software virtualization is even more advantageous when combined with hardware virtualization technologies such as VMware, xVM (Xen) or Virtual Box. It simplifies management while improving robustness and security, which results in customer installations that are reproducible and always up to date.</p>	
1470	<b>Project Caroline: Platform as a Service</b>	<b>Bob Scheifler, John McClain, Thomas Johnson, Brian Jeltema, Mark Hodapp</b>
	Project Caroline is a research project developing a platform for development and deployment of dynamically scalable Internet-based services. The platform comprises a programmatically configurable pool of virtualized compute, storage, and networking resources. Project Caroline helps software providers develop services rapidly, update in-production services frequently, and automatically flex their use of platform resources to match changing runtime demands.	
1410	<b>Project Sedna: Next Generation Switch</b>	<b>Hans Eberle, Wladyslaw Olesinski, Nils Gura</b>
	Project Sedna is showcasing the first prototype of a multi-chip module based on Proximity Communication. Applied to switched interconnects, Proximity Communication allows for a flat, monolithic switch element of unparalleled scale.	
1410	<b>OpenSPARC on FPGA</b>	<b>Durgam Vahia, Thomas Thatcher, Gopal Reddy</b>
	Multi-threaded OpenSPARC design mapped on Xilinx FPGA board booting OpenSolaris.	

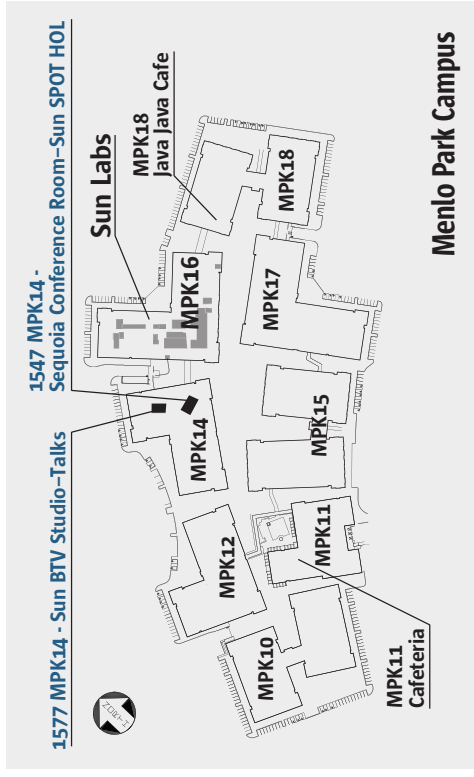
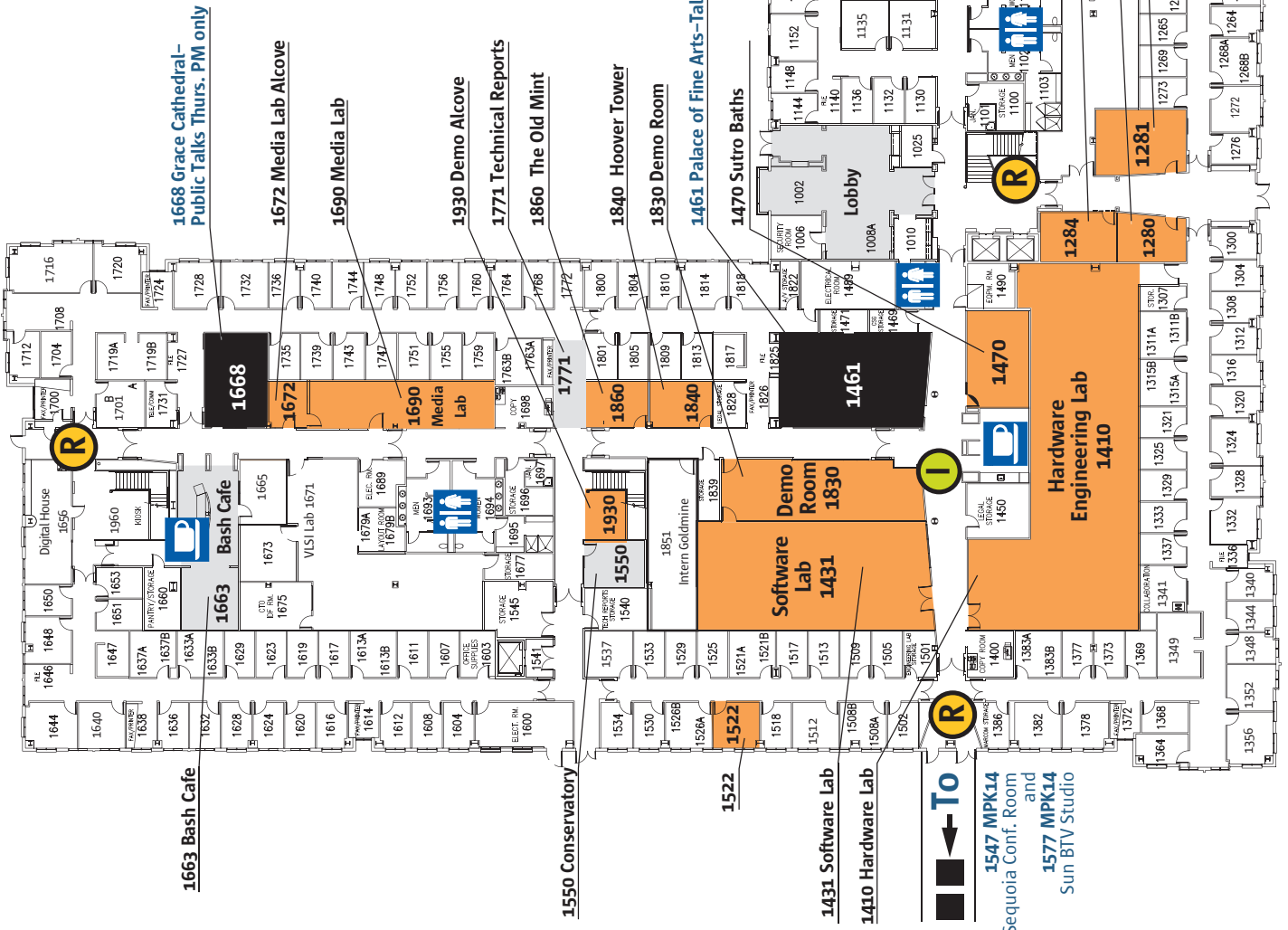
Room #	Demo Title	Demo Team
1431	<b>Solarium—Sun SPOT Management System</b>	<b>Randy Smith</b>
	Solarium is a system for collecting information about local Sun SPOTs so you can monitor and manage a deployment. It includes a GUI for programming, inspecting, and reconfiguring individual SPOTs.	
1431	<b>Sun SPOT—Emulator</b>	<b>Ron Goldman, Vipul Gupta</b>
	Use the Solarium interface to expose an emulation environment for the Sun SPOT platform. Solarium enables the use of SPOT API's without the need to buy any hardware.	
1431	<b>Sun SPOT—Yggdrasil</b>	<b>Lachlan Gregor, Arshan Poursohi</b>
	An application framework designed to facilitate the use of Sun SPOTs for deeply embedded environmental data collection. Supports the use of SPOTs from the embedded node to the database and finally to simple visualization.	
1431	<b>Sun SPOT—eDAQ</b>	<b>Tennessee Carmel-Veilleux, Robert Alkire</b>
	A new Sun SPOT daughter card designed for analog to digital capture at high quality and high sampling rates.	
1431	<b>Project Squawk</b>	<b>Eric Arseneau</b>
	Come talk with the core developers of Squawk.	
1431	<b>Dynamic Optimization of JVM Garbage Collection Policies</b>	<b>David Vengerov</b>
	An analytical expression was derived for the application's throughput (fraction of time spent on useful work rather than on garbage collection) in terms of the following key parameters: the sizes of the Young (Eden and survivor spaces) and Old (Tenured) memory spaces and the value of the tenuring threshold. Based on the derived expression, a practical algorithm THRUMAX is proposed for tuning the GC parameters so as to maximize the application's throughput. Performance of THRUMAX was evaluated for various settings of the SPECjbb2005 workload, and a consistent improvement in throughput was demonstrated relative to the throughput achievable with the current JVM.	
1830	<b>Project Wonderland</b>	<b>Nicole Yankelovich, Jonathan Kaplan, Paul Byrne, Joe Provino, Nigel Simpson, Deron Johnson, Douglas Twilleager, Bernard Horan</b>
	Project Wonderland is an open source toolkit for building 3D virtual worlds for business and education collaboration. Within a Wonderland virtual world, people can conduct business, interact with team members, and have chance encounters with colleagues, all using natural voice interaction. Most importantly, real work can be accomplished with Wonderland's support of X and Java applications. With application sharing as the default, people can create, edit, and share documents within the virtual world. Wonderland is built on top of the Project Darkstar game server platform, which provides enterprise-grade scalability, reliability, and flexible integration with other enterprise systems.	
1840	<b>Project Aura</b>	<b>Jeff Alexander, Steve Green, Paul Lamere</b>
	Project Aura is a web-scale, open, hybrid recommendation system. It combines similarity based on the information "aura" around the items added to it with the social data commonly used to generate recommendations. By doing so, the project aims to solve the "cold start" problem associated with adding new items that are as yet unseen by the users. Aura is an open system—any web site can contribute data and any web site can use Aura for recommendations. Users have the right to retrieve all of their data and to remove it from the system. As an initial application, we will be showing a blog recommender built on top of Aura.	

Room #	Demo Title	Demo Team
1860	<b>The Lively Kernel Project — Turning Web Programming Upside Down</b>	<b>Dan Ingalls, Tommi Mikkonen, Krzysztof Palacz, Antero Taivalsaari</b>
	<p>The Sun Labs Lively Kernel is a new web programming environment developed at Sun Labs. The Lively Kernel supports desktop-style applications with rich graphics and direct manipulation capabilities, but without the installation or upgrade hassles that conventional desktop applications have. The system is written entirely in the JavaScript programming language—a language supported by all the web browsers—with the intent that the system can run in commercial web browsers without installation or any plug-in components. The system leverages the dynamic aspects of the JavaScript language to make it possible to create, modify and deploy applications on the fly, using tools built into the system itself.</p> <p>In addition to its application execution capabilities, the Lively Kernel system can also function as an integrated development environment (IDE), making the whole system self-sustaining and able to improve and extend itself dynamically. In doing so, the system demonstrates an entirely new way to develop web applications and to develop software in general.</p>	
1930	<b>Workload Characterization</b>	<b>Lodewijk Bonebakker</b>
	<p>This set of posters will present the need for representative workloads to guide the design process for modern computer systems.</p>	
1522	<b>The Electric VLSI Design System</b>	<b>Steven Rubin, Gilda Garreton, Dmitry Nadezhin, Russell Kao</b>
	<p>Electric is an open-source EDA system for integrated-circuit design, written in Java. It supports IC layout, schematics, and textual hardware-description languages. It also contains many synthesis and analysis tools.</p> <p>Recent experiments with Electric attempt to solve the problem of very large designs by implementing a client/server facility in which the server holds the entire chip while a thin-client displays and edits only a portion of the design. Other experiments are exploring multithreaded CAD tools (such as DRC and Routing).</p>	
1690	<b>OMS</b>	<b>Kelly Kishore, Peter Farkas</b>
	<p>Display of varying video codecs, tools, etc.</p>	
1672	<b>Java Card</b>	<b>Sebastian Hans, Kelly Kishore</b>
	<p>Next-generation Java Card with DReAM-CAS.</p>	



# 2008 Sun Labs Open House Menlo Park 16, Floor 1

Legend:



Menlo Park Campus



1547 MPK14  
Sequoia Conf. Room  
and  
1577 MPK14  
Sun BTV Studio