

Real world system  
administration training

# LISA'08

22<sup>ND</sup> LARGE INSTALLATION SYSTEM  
ADMINISTRATION CONFERENCE

San Diego  
CALIFORNIA

November 9–14, 2008

## KEYNOTE ADDRESS

"Implementing Intellipedia Within a 'Need to Know' Culture" by Sean Dennehy, *Chief of Intellipedia Development, Directorate of Intelligence, U.S. Central Intelligence Agency*

## PLENARY SESSIONS

"Reconceptualizing Security," by Bruce Schneier, *Founder and CTO, BT Counterpane*

"The State of Electronic Voting, 2008," by David Wagner, *University of California, Berkeley*

## 6 DAYS OF TRAINING

- **New! Virtualization Track:** Xen Hypervisor, VMware ESX 3i, and security taught by Stephen Spector, John Arrasjid, Phil Cox, and more
- **New! Solaris Track:** Debugging, administration, and DTrace taught by James Mauro, Peter Baer Galvin, and Marc Staveley
- Plus classes on Cfengine 3 by Mark Burgess, RRDtool by Tobias Oetiker, and more . . .

## 3-DAY TECHNICAL PROGRAM

- 2 tracks of Invited Talks by industry leaders on timely topics—live streaming available!
- Refereed papers on topics such as configuration management, parallel systems deployment, virtualization, and security
- Workshops, Guru Is In sessions, Birds-of-a-Feather sessions, Work-in-Progress reports, posters, and more!
- Vendor Exhibition: A showcase of the latest commercial innovations

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Register by October 17 and save! [www.usenix.org/lisa2008](http://www.usenix.org/lisa2008)

## WHY I ATTEND LISA

"There is always one thing that I learn that makes me want to shout, 'That just paid for the entire conference!'"

Tom Limoncelli  
Google NYC

### LISA '08 AT A GLANCE

#### Saturday, November 8

5:00 p.m.–8:00 p.m. On-Site Registration

#### Sunday, November 9

7:30 a.m.–5:00 p.m. On-Site Registration  
9:00 a.m.–5:00 p.m. Training Program  
9:00 a.m.–5:00 p.m. Workshop: Fighting Spam  
9:00 a.m.–5:00 p.m. Workshop: MicroLISA  
9:00 a.m.–12:30 p.m. Workshop: Business-Driven IT Management  
1:30 p.m.–5:00 p.m. Workshop: Configuration Management

#### Monday, November 10

7:30 a.m.–5:00 p.m. On-Site Registration  
9:00 a.m.–5:00 p.m. Training Program  
9:00 a.m.–5:00 p.m. Workshop: University Issues  
9:00 a.m.–5:00 p.m. Workshop: ZFS  
9:00 a.m.–5:00 p.m. Workshop: Government and Military System Administration  
7:00 p.m.–11:00 p.m. Birds-of-a-Feather Sessions (BoFs)

#### Tuesday, November 11

7:30 a.m.–5:00 p.m. On-Site Registration  
9:00 a.m.–5:00 p.m. Training Program  
9:00 a.m.–5:00 p.m. Workshop: Advanced Topics  
9:00 a.m.–5:00 p.m. Workshop: Best Practices in the Server Room  
9:00 a.m.–5:00 p.m. Workshop: Virtual Infrastructures  
7:00 p.m.–11:00 p.m. Birds-of-a-Feather Sessions (BoFs)

#### Wednesday, November 12

7:30 a.m.–5:00 p.m. On-Site Registration  
8:45 a.m.–10:30 a.m. Opening Remarks, Awards, and Keynote  
9:00 a.m.–5:00 p.m. Training Program  
11:00 a.m.–5:30 p.m. Technical Sessions  
Noon–7:00 p.m. Vendor Exhibition  
5:30 p.m.–6:30 p.m. Exhibit Hall Happy Hour  
6:30 p.m.–7:30 p.m. Poster Session  
7:30 p.m.–11:30 p.m. Birds-of-a-Feather Sessions (BoFs)

#### Thursday, November 13

7:30 a.m.–5:00 p.m. On-Site Registration  
9:00 a.m.–5:00 p.m. Training Program  
9:00 a.m.–5:30 p.m. Technical Sessions  
10:00 a.m.–2:00 p.m. Vendor Exhibition  
5:30 p.m.–6:30 p.m. Poster Session  
6:30 p.m.–8:30 p.m. Reception  
8:30 p.m.–11:30 p.m. Birds-of-a-Feather Sessions (BoFs)

#### Friday, November 14

8:00 a.m.–noon On-Site Registration  
9:00 a.m.–5:00 p.m. Training Program  
9:00 a.m.–3:30 p.m. Technical Program  
4:00 p.m.–5:30 p.m. Closing Session

USENIX

LISA '08 is still the meeting place of choice for system, network, database, and other computer administrators and engineers from all over the world. Take advantage of 6 days of top-notch training and return with the skills you need to take your career to new heights.

# LISA'08

## Dear Colleague,

On behalf of all of the LISA '08 organizers, I'd like to invite you to join us in San Diego, CA, for the 22nd Large Installation System Administration Conference.

For the past 20 years LISA has been the focal point for the global community of system and network administrators. This year LISA continues that tradition, featuring innovative tools and techniques essential for your professional and technical development.

Take advantage of the popular 6 days of training. Select from over 50 tutorials taught by highly expert instructors, including:

- Mark Burgess on Integrating Cfengine into Organizational Service Management
- Tom Christiansen on Advanced Perl
- David N. Blank-Edelman on Over the Edge System Administration

Plus, new in 2008, we're offering tracks on virtualization and on Solaris. These two 6-day series include classes such as:

- Peter Baer Galvin on Solaris 10 Administration
- Jim Mauro on Solaris Dynamic Tracing (DTrace)
- Richard McDougall on VMware ESX Performance and Tuning

In addition to the training, 3 days of technical sessions include top-notch refereed papers, informative invited talks, expert Guru Is In sessions, and a poster session.

Our 20+ invited talks feature our most impressive slate of speakers to date. They include:

- Keynote Address: "Implementing Intellipedia Within a 'Need to Know' Culture," by Sean Dennehy, Chief of Intellipedia Development, Directorate of Intelligence, U.S. Central Intelligence Agency
- Plenary Session: "Reconceptualizing Security," by Bruce Schneier, Chief Security Technology Officer, BT
- Plenary Session: "The State of Electronic Voting, 2008," by David Wagner, University of California, Berkeley

LISA is the premier forum for presenting new research in system administration. We selected papers showcasing state-of-the-art work on topics including configuration management, parallel systems deployment, virtualization, and security.

Bring your perplexing technical questions to experts at LISA's Guru Is In sessions.

Explore the latest commercial innovations at the Vendor Exhibition.

Benefit from opportunities for peer interaction (a.k.a. the "Hallway Track").

Take advantage of the live streaming opportunities.

Early registration discounts for LISA '08, taking place November 9–14, 2008, in San Diego, are now available. Register by Friday, October 17, and save up to \$300!

We're pleased to bring LISA to San Diego and we look forward to seeing you there.

**Mario Obejas, *Raytheon***  
**LISA '08 Program Chair**

## Program Chair

Mario Obejas, *Raytheon*

## Program Committee

Paul Anderson, *University of Edinburgh*

Derek Balling, *Answers Corporation*

Travis Campbell, *AMD*

Narayan Desai, *Argonne National Laboratory*

Aileen Frisch, *Exponential Consulting*

Brent Hoon Kang, *University of North Carolina at Charlotte*

Chris McEniry, *Sony Computer Entertainment America*

Adam Moskowitz, *Permabit Technology Corporation*

David Parter, *University of Wisconsin*

David Plonka, *University of Wisconsin*

Kent Skaar, *BMC Software, Inc.*

## Invited Talks Coordinators

Rudi van Drunen, *Competa IT/Xlexit*

Philip Kizer, *Tekelec*

## Workshops Coordinator

Lee Damon, *University of Washington*

## Guru Is In Coordinator

John "Rowan" Littell, *California College of the Arts*

## Work-in-Progress Reports and Posters Coordinators

Brent Hoon Kang, *University of North Carolina at Charlotte*

Gautam Singaraju, *University of North Carolina at Charlotte*

## USENIX Board Liaison

Alva L. Couch, *Tufts University*

## The USENIX Association Staff



# TRAINING AT A GLANCE



## SUNDAY, NOVEMBER 9

FULL DAY: 9:00 A.M.–5:00 P.M.

- S1 Virtualization! What's It Good For? ★NEW ●  
Æleen Frisch and Kyrre Begnum
- S2 Solaris 10 Performance, Observability, and Debugging ●  
James Mauro
- S3 Performance Tools, Metrics, and Tuning for Solaris/  
Linux ★NEW  
Adrian Cockcroft
- S4 Computer Forensics (Hands-on)  
Simson L. Garfinkel
- S5 Inside the Linux 2.6 Kernel  
Theodore Ts'o

HALF DAY MORNING: 9:00 A.M.–12:30 P.M.

- S6 Security Without Firewalls  
Abe Singer
- S7 Advanced Perl, Part 1: Strings, Unicode, and Pattern  
Matching ★NEW  
Tom Christiansen
- S8 Management 101: Effective Communication Tools for  
Sysadmins  
Geoff Halprin and Elizabeth Zwicky

HALF DAY AFTERNOON: 1:30 P.M.–5:00 P.M.

- S9 Building a Logging Infrastructure and Log Analysis for  
Security  
Abe Singer
- S10 Advanced Perl, Part 2: Packages, Modules, and  
Classes ★NEW  
Tom Christiansen
- S11 Management 201: Effective Team Management of System  
Administrators  
Geoff Halprin and Elizabeth Zwicky

**NEW! TRAINING SERIES ON VIRTUALIZATION AND SOLARIS**  
LISA now offers two 6-day series of classes, focusing on some of the most important topics you'll encounter: virtualization and Solaris. Follow the icons throughout the training section and complete the series. See p. 14 for more information about these special tracks.



## MONDAY, NOVEMBER 10

FULL DAY: 9:00 A.M.–5:00 P.M.

- M1 Introduction to the Open Source Xen Hypervisor ★NEW ●  
Stephen Spector, Wenjin Hu, and Zach Shepherd
- M2 System and Network Performance Tuning ●  
Marc Staveley
- M3 Computer Forensics: Disk Forensics and Lab (Hands-on) ★NEW  
Simson L. Garfinkel
- M4 Administering Linux in Production Environments  
Æleen Frisch
- M5 Seven Habits of the Highly Effective System Administrator:  
Hints, Tricks, Techniques, and Tools of the Trade  
Lee Damon and Mike Ciavarella
- M6 Effective Change Management: Making System Integrity Easy  
Geoff Halprin

HALF DAY MORNING: 9:00 A.M.–12:30 P.M.

- M7 Advanced Perl, Part 3: Multitasking via Processes and  
Threads ★NEW  
Tom Christiansen
- M8 Working with SELinux ★NEW  
Rik Farrow
- M9 RRDtool as a Communication Tool  
Tobias Oetiker

HALF DAY AFTERNOON: 1:30 P.M.–5:00 P.M.

- M10 Performance Tracking with Cacti  
John Sellens
- M11 Wireshark (Ethereal) and the Art of Debugging Networks  
Gerald Carter
- M12 The Joy of Running Diskless Linux  
Tobias Oetiker

## TUESDAY, NOVEMBER 11

FULL DAY: 9:00 A.M.–5:00 P.M.

- T1 Virtualization with VMware ESX 3i for UNIX Administrators:  
The Fundamentals ●  
John Arrasjid and Shridhar Deuskar
- T2 Solaris Dynamic Tracing (DTrace) ★NEW ●  
James Mauro

HALF DAY MORNING: 9:00 A.M.–12:30 P.M.

- T3 Databases: What You Need to Know  
John Sellens
- T4 RRDtool by Example ★NEW  
Tobias Oetiker
- T5 Advanced Shell Programming  
Mike Ciavarella

Want more info? Please see [www.usenix.org/lisa08/training](http://www.usenix.org/lisa08/training) for comprehensive tutorial descriptions, including full topics lists and prerequisites.

## TUESDAY, NOVEMBER 11 (CONTINUED)

### HALF DAY MORNING: 9:00 A.M.–12:30 P.M. (CONTINUED)

- T6 Disk-to-Disk Backup and Eliminating Backup System Bottlenecks ★UPDATED FOR 2008  
Jacob Farmer
- T7 Recovering from Linux Hard Drive Disasters  
Theodore Ts'o
- T8 Integrating Cfengine into Organizational Service Management ★NEW  
Mark Burgess
- T9 Reinventing Yourself ★NEW  
Marcus Ranum

### HALF DAY AFTERNOON: 1:30 P.M.–5:00 P.M.

- T10 Nagios: Advanced Topics  
John Sellens
- T11 Writing JavaScript Applications Running in the Browser with Qooxdoo ★NEW  
Tobias Oetiker
- T12 Documentation Techniques for Sysadmins  
Mike Ciavarella
- T13 Next-Generation Storage Networking ★UPDATED FOR 2008  
Jacob Farmer
- T14 An Introduction to SystemTap ★NEW  
Theodore Ts'o
- T15 Cfengine 3 ★NEW  
Mark Burgess
- T16 Incident Response ★NEW  
Abe Singer

## WEDNESDAY, NOVEMBER 12

### FULL DAY: 9:00 A.M.–5:00 P.M.

- W1 Virtualization with VMware ESX 3i for UNIX Administrators: Advanced Topics ●  
John Arrasjid and Shridhar Deuskar
- W2 Building Web Interfaces with PHP and SQL ★NEW  
Marcus Ranum

### HALF DAY MORNING: 9:00 A.M.–12:30 P.M.

- W3 Solaris 10 Administration Workshop 1: Administration (Hands-on) ★NEW ●  
Peter Baer Galvin and Marc Staveley
- W4 Achieving High Availability (in Your Lifetime)  
Evan Marcus
- W5 Beyond Shell Scripts: 21st-Century Automation Tools and Techniques  
Aleen Frisch

## WEDNESDAY, NOVEMBER 12 (CONTINUED)

### HALF DAY AFTERNOON: 1:30 P.M.–5:00 P.M.

- W6 Solaris 10 Administration Workshop 2: Virtualization (Hands-on) ★NEW ●  
Peter Baer Galvin and Marc Staveley
- W7 Disaster Preparedness (and Recovery): How to Keep Your Company (and Your Job) Alive  
Evan Marcus
- W8 DNS and DHCP Considerations When Migrating to IPv6 ★NEW  
Peter Loshier

## THURSDAY, NOVEMBER 13

### FULL DAY: 9:00 A.M.–5:00 P.M.

- R1 Securing Virtual Servers: XenServer and VMware ESX Server ★NEW ●  
Phil Cox
- R2 So You Have Active Directory: Now What? A Field Guide to AD Integration for UNIX Sysadmins  
Gerald Carter

### HALF DAY MORNING: 9:00 A.M.–12:30 P.M.

- R3 Solaris 10 Administration Workshop 3: File Systems (Hands-on) ★NEW ●  
Peter Baer Galvin and Marc Staveley
- R4 Over the Edge System Administration, Volume 1  
David N. Blank-Edelman

### HALF DAY AFTERNOON: 1:30 P.M.–5:00 P.M.

- R5 Solaris 10 Administration Workshop 4: Security (Hands-on) ★NEW ●  
Peter Baer Galvin and Marc Staveley
- R6 Over the Edge System Administration, Volume 2  
David N. Blank-Edelman

## FRIDAY, NOVEMBER 14

### FULL DAY: 9:00 A.M.–5:00 P.M.

- F1 VMware ESX Performance and Tuning ★NEW ●  
Richard McDougall
- F2 Resource Management with Solaris Containers ●  
Jeff Victor
- F3 Implementing [Open]LDAP Directories  
Gerald Carter
- F4 Practical Python for System Administrators ★NEW  
Steve Holden

# TRAINING PROGRAM



Full Day (9:00 a.m.–5:00 p.m.)

## S1 Virtualization! What's It Good



For? ★NEW

Æleen Frisch, *Exponential Consulting*;  
Kyrre Begnum, *Oslo University College*

**Who should attend:** Sysadmins who are curious about the benefits of virtualization or who need to deploy it in their environment.

**Take back to work:** The ability to begin deploying virtualization in your environment, along with an understanding of the many tradeoffs you will need to address.

**Topics include:**

- What virtualization is and what it can and cannot do for you
- Available software and management options
- Typical deployment scenarios and special-purpose solutions
- Administrative challenges of integrating virtualization into your existing environment
- Security issues with virtualization

## S2 Solaris 10 Performance, Observability, and Debugging



James Mauro, *Sun Microsystems*;  
Richard McDougall, *VMware*

**Who should attend:** Anyone who supports or may support Solaris 10 machines.

**Take back to work:** How to apply the tools and utilities available in Solaris 10 to resolve performance issues and pathological behavior and to understand the system and workload better.

**Topics include:**

- Solaris 10 features overview
- Solaris 10 tools and utilities
- Understanding memory use and performance
- Understanding thread execution flow and profiling
- Understanding I/O flow and performance
- Looking at network traffic and performance

- Application and kernel interaction
- Putting it all together

## S3 Performance Tools, Metrics, and Tuning for Solaris/Linux ★NEW

Adrian Cockcroft, *Netflix, Inc.*

**Who should attend:** Capacity planning engineers and sysadmins with an interest in performance optimization and who work with Solaris or Linux.

**Take back to work:** A vendor- and OS-independent understanding of capacity planning techniques and tools, an understanding of the meaning and behavior of metrics, and knowledge of the common fallacies, misleading indicators, sources of measurement error, and other traps for the unwary.

**Topics include:**

- Computer system and network performance data collection, analysis, modeling, and capacity planning on any platform using bundled utilities and freely available tools such as Orca, BigBrother, Open-NMS, Nagios, Ganglia, SE Toolkit, R, Ethernet/Wireshark, Ntop, MySQL and PDQ
- TCP/IP measurement and tuning
- Complex storage subsystems
- Virtualization
- Advanced Solaris metrics

## S4 Computer Forensics (Hands-on)

Simson L. Garfinkel, *Naval Postgraduate School*

**Who should attend:** Anyone interested in recovering lost or deleted data, hunting for clues, and tracking information.

**Take back to work:** An in-depth understanding of why forensic tools are possible, what they can do, their limits, and the legal environment that governs U.S. forensics.

**Topics include:**

- Memory forensics and file carving
- Forensics and policy
- Disk, network, document, and Web forensics
- Anti-forensics

## S5 Inside the Linux 2.6 Kernel

Theodore Ts'o, *IBM Linux Technology Center*

**Who should attend:** Application programmers, sysadmins interested in performance tuning their Linux systems, and kernel developers.

**Take back to work:** An overview and roadmap of the kernel's design and functionality: its structure, the basic features it provides, and the most important algorithms it employs.

**Topics include:**

- How the kernel is organized
- Ground rules of kernel programming
- Implementation and properties of the most important algorithms
- Comparison between Linux and UNIX kernels, with emphasis on differences in algorithms
- Details of the Linux scheduler
- The virtual memory subsystem
- Linux's virtual file system layer
- A quick tour through Linux's networking stack

Half Day Morning (9:00 a.m.–12:30 p.m.)

## S6 Security Without Firewalls

Abe Singer, *San Diego Supercomputer Center*

**Who should attend:** Administrators who want or need to explore strong, low-cost, scalable security without firewalls.

**Take back to work:** How to build effective, scalable, host-based security without firewalls.

**Topics include:**

- The threat perspective from a data-centric point of view
- How to implement and maintain centralized configuration management using Cfengine and how to build reference systems for fast and consistent (re)installation of hosts
- Secure configuration and management of core network services such as NFS, DNS, and SSH

- Good system administration practices
- Implementing strong authentication and eliminating use of plaintext passwords for services such as POP/IMAP
- A sound patching strategy
- An overview of the compromise, how we recovered, and what we learned

**S7 Advanced Perl, Part 1: Strings, Unicode, and Pattern Matching** ★NEW  
Tom Christiansen, *Perl Consultant*

**Who should attend:** Perl programmers who handle international or legacy datasets or who need to output in UTF-8 (like most Web pages).

**Take back to work:** How to use the powerful new matching facilities in Perl 5.10 and how to write, debug, and maintain regexes even when the patterns grow ever more complex.

**Topics include:**

- Opening filehandles to in-memory strings
- Constant and/or read-only strings
- String functions from `Scalar::Util`
- Perl Unicode support
- Encodings and I/O layers
- Possessive quantifiers
- New backtracking control verbs
- New match variables and pattern switches
- Context and scoping issues
- Case-conversions and quoting
- Capture buffers (backreferences)
- Dynamic regexes using `qr//`
- New relative and named capture buffers
- New dynamic and recursive patterns
- Security concerns in pattern matching

**S8 Management 101: Effective Communication Tools for Sysadmins**  
Geoff Halprin and Elizabeth Zwicky, *Consultants*

**Who should attend:** Sysadmins who wish to become more proactive in managing their duties and to learn tools and tips that will assist them to communicate more effectively with their managers, users, and other important constituents of their services.

**Take back to work:** Improved communication skills that will make you a more effective system administrator.

**Topics include:**

- Oral and written communication
- Understanding others
- Time, risk, and project management

Half Day Afternoon (1:30 p.m.–5:00 p.m.)

**S9 Building a Logging Infrastructure and Log Analysis for Security**  
Abe Singer, *San Diego Supercomputer Center*

**Who should attend:** System, network, and security administrators who want to be able to separate the wheat of warning information from the chaff of normal activity in their log files.

**Take back to work:** How to get a handle on your log files, which can help you run your systems and networks more effectively and can provide forensic information for post-incident investigation.

**Topics include:**

- Problems, issues, and scale of handling log information
- Generating useful log information: improving the quality of your logs
- Collecting and storing log information
- Log analysis
- How to handle and preserve log files for human resources issues and legal matters

**S10 Advanced Perl, Part 2: Packages, Modules, and Classes** ★NEW  
Tom Christiansen, *Perl Consultant*

**Who should attend:** Perl programmers, those needing complex data structure or object facilities, and those interested in the higher-level object facilities of tying and overloading or in building their own lexical pragmas.

**Take back to work:** Knowledge of Perl's package mechanism, as well as the basis for modules and classes.

**Topics include:**

- Typeglobs
- Per-package symbol-table hashes
- Symbolic references
- Overriding built-in functions
- Saving complex data structures
- New and improved pragmas and modules
- Numbers as objects
- Conditional module loading
- New object facilities
- Overloading operations and constants
- Packaging up modules for distros

**S11 Management 201: Effective Team Management of System Administrators**

Geoff Halprin and Elizabeth Zwicky, *Consultants*

**Who should attend:** Sysadmins who have found themselves being given (or are hoping to be given, or are anticipating with apprehension) responsibilities for other people.

**Take back to work:** The techniques you need to be effective in your "organization-facing" duties.

**Topics include:**

- Sysadmin workflow
- Personal and workgroup productivity
- Progress reporting and journals
- Financial management

# TRAINING PROGRAM



Full Day (9:00 a.m.–5:00 p.m.)

## M1 Introduction to the Open Source Xen Hypervisor ★NEW



Stephen Spector, *Citrix*; Wenjin Hu and Zach Shepherd, *Clarkson University*

**Who should attend:** Sysadmins and architects who are interested in deploying the open source Xen hypervisor in a production environment.

**Take back to work:** How to build and deploy the Xen hypervisor.

**Topics include:**

- Xen architecture overview
- Building a Xen hypervisor from Xen.org
- Installation and configuration
- Virtual machine creation and operation
- Performance: tools and methodology
- Best practices using Xen

## M2 System and Network Performance Tuning



Marc Staveley, *Soma Networks*

**Who should attend:** Novice and advanced UNIX system and network administrators, and UNIX developers concerned about network performance impacts. A basic understanding of UNIX system facilities and network environments is assumed.

**Take back to work:** Procedures and techniques for tuning your systems, networks, and application code, along with guidelines for capacity planning and customized monitoring.

**Topics include:**

- Performance tuning strategies
- Server tuning
- NFS performance tuning
- Network performance, design, and capacity planning
- Application tuning

## M3 Computer Forensics: Disk Forensics and Lab (Hands-on) ★NEW

Simson L. Garfinkel, *Naval Postgraduate School*

**Who should attend:** Anyone interested in forensics or data recovery. Note: S3 is *not* a prerequisite to this class. Please see the Web site for what hardware and software are required.

**Take back to work:** A deeper understanding of modern disk forensic tools, including both open source and commercial; drill-down familiarity with disk forensics, including specific tools and techniques; enough information about operating systems to understand why forensic tools are possible, what they can do, and their limits.

**Topics include:**

- Searches of hard drives and recovery of deleted files with commercial and open source tools: Sleuth Kit, EnCase, and FTK
- File carving
- Anti-forensics

## M4 Administering Linux in Production Environments

Æleen Frisch, *Exponential Consulting*

**Who should attend:** Both current Linux system administrators and administrators from sites considering converting to Linux or adding Linux systems to their current computing resources.

**Take back to work:** The knowledge necessary to add reliability and availability to your systems and to assess and implement tools needed for production-quality Linux systems

**Topics include:**

- Recent kernel developments
- High-performance I/O
- Advanced compute-server environments
- Enterprise-wide security features, including centralized authentication
- Automation techniques and facilities
- Linux performance tuning

## M5 Seven Habits of the Highly Effective System Administrator: Hints, Tricks, Techniques, and Tools of the Trade

Lee Damon, *University of Washington*; Mike Ciavarella, *Consultant*

**Who should attend:** Junior sysadmins who want to “do it right the first time.”

**Take back to work:** Ideas about how to streamline your systems and your workload and, just as important, where to look to find more answers.

**Topics include:**

- Why your computers should all agree on the time
- Why *not* to back up everything
- Budgeting
- Books that can help you and your users

## M6 Effective Change Management: Making System Integrity Easy

Geoff Halprin, *Consultant*

**Who should attend:** Sysadmins who wish to learn how to better manage change and risk, those who are responsible for developing or managing their organization’s change management process, and those who are hoping to improve their organization’s process.

**Take back to work:** A grasp of the many aspects of effective change management and how you can improve the process.

**Topics include:**

- Building a change plan
- Regression planning and risk management strategies
- Change execution tools and techniques
- Emergency changes and downtime conferences

Half Day Morning (9:00 a.m.–12:30 p.m.)

**M7 Advanced Perl, Part 3: Multitasking via Processes and Threads** ★NEW

Tom Christiansen, *Perl Consultant*

**Who should attend:** Perl programmers and sysadmins who need to write programs that do more than one thing at a time.

**Take back to work:** A deep understanding of process management facilities, I/O redirection and control, the accept/connect client-server model, and threads.

**Topics include:**

- Multitasking: Full-process forking vs. threading
- Signals: safe and otherwise
- Accessing POSIX signal facilities
- Signals, system(), and backticks
- Stderr redirection
- Security concerns in external commands
- Safe pipe opens
- Deadlock issues in pipe handling
- IPC::Open2 and IPC::Open3
- Low-level primitives: fork, pipe, waitpid, exec
- Forking servers and client-server hybrids
- Sharing data across forks
- The ithread model: use threads
- Thread management: creation, joining, detaching
- Retrieving data from a thread
- Working with threads objects
- Sharing data among threads
- Yielding the processor
- Locking protocols and deadlock avoidance
- Locking variables, subroutines, and methods
- The Thread::Queue module
- Thread-queues vs. process-pipes
- Using Semaphores from Thread::Semaphore
- Process pools vs. thread pools
- Useful threading modules from CPAN

**M8 Working with SELinux** ★NEW

Rik Farrow, *Security Consultant*

**Who should attend:** Sysadmins and security managers of Linux systems who want or are required to use SELinux.

**Take back to work:** An awareness of new tools and techniques for debugging problems with SELinux configuration and applications.

**Topics include:**

- SELinux uncloaked
- Using the audit file
- Adjusting file/directory context
- Using Booleans to adjust policy
- Editing and rebuilding policy

**M9 RRDtool as a Communication Tool**

Tobias Oetiker, *Consultant and Author of RRDtool*

**Who should attend:** Scripters and programmers who would like to create a custom monitoring application with great presentation tools.

**Take back to work:** Ideas for building the monitoring application of your dreams.

**Topics include:**

- RRDtool overview
- Programming with RRDtool
- In-depth graphing
- Scaling RRDtool

Half Day Afternoon (1:30 p.m.–5:00 p.m.)

**M10 Performance Tracking with Cacti**

John Sellens, *SYONEX*

**Who should attend:** Network and system administrators ready to implement a graphical performance and activity monitoring tool, who prefer an integrated, Web-based interface.

**Take back to work:** The information needed to immediately implement and use Cacti to monitor systems and devices on your networks.

**Topics include:**

- Installations
- Configuration, setup options, and how to manage larger and non-trivial configurations

- User management and access control
- Special cases: how to deal with interesting problems
- Extending Cacti: how to write scripts or programs to extend the functionality of the basic package
- Security concerns and access control
- Ongoing operations

**M11 Wireshark (Ethereal) and the Art of Debugging Networks**

Gerald Carter, *Likewise Software*

**Who should attend:** System and network administrators who are interested in learning how network traffic monitoring and analysis can be used as a debugging, auditing, and security tool.

**Take back to work:** How to use the Ethereal protocol analyzer as a debugging and auditing tool for TCP/IP networks.

**Topics include:**

- Wireshark for network tracing
- TCP/IP protocol basics
- Analysis of popular application protocols
- How some kinds of TCP/IP network attacks can be recognized

**M12 The Joy of Running Diskless Linux**

Tobias Oetiker, *Consultant*

**Who should attend:** Linux/UNIX sysadmins who manage several networked UNIX workstations or cluster nodes.

**Take back to work:** The ability to slash your installation times and downtime.

**Topics include:**

- Installing Linux without a workstation
- Providing a homogeneous application environment
- How to make the automounter sit up and beg
- Managing mixed 32- and 64-bit environments

# TRAINING PROGRAM



Full Day (9:00 a.m.–5:00 p.m.)

## T1 Virtualization with VMware ESX 3i for UNIX Administrators: The Fundamentals



John Arrasjid and Shridhar Deuskar, VMware

**Who should attend:** Sysadmins and architects who are interested in deploying a VMware Virtual Infrastructure, including ESX Server and VirtualCenter, in a production environment.

**Take back to work:** An understanding of ESXi 3.5 and VirtualCenter installation, configuration, and basic design architectures around networking and storage.

**Topics include:**

- Virtualization overview
- ESX 3i installation and configuration
- Networking overview and configuring vSwitches
- Storage overview and configuring datastores
- RCLI for the UNIX administrator
- VMI 101
- Virtual machines, virtual appliances, and the OVF
- Clusters, Resource Pools and VMware HA, VMware DRS

## T2 Solaris Dynamic Tracing (DTrace) ★NEW



James Mauro, Sun Microsystems

**Who should attend:** Sysadmins and other production support staff that need to look at systems and figure out what they're doing or why they're running slowly on a regular basis.

**Take back to work:** How to use Dynamic Tracing (DTrace) technology to understand the behavior of your systems and the workloads they run, whether you're chasing a performance problem or pathological behavior or you simply wish to better understand how applications are using the underlying system.

**Topics include:**

- Introduction to DTrace
- DTrace components
- Using DTrace
- DTrace in open source software
- Advanced topics

Half Day Morning (9:00 a.m.–12:30 p.m.)

## T3 Databases: What You Need to Know

John Sellens, SYONEX

**Who should attend:** System and application administrators who need to support databases and database-backed applications.

**Take back to work:** A better understanding of databases and how to deploy and support common database software and database-backed applications.

**Topics include:**

- MySQL, PostgreSQL, Berkeley DB
- Security, user management, and access controls
- Ad hoc queries with standard interfaces
- Database access from other tools (Perl, PHP, sqsh, etc.)

## T4 RRDtool by Example ★NEW

Tobias Oetiker, Consultant and Author of RRDTool

**Who should attend:** Sysadmins who may only have accessed RRDtool through some front-end application such as Cacti or Cricket and would like to get a look under the hood.

**Take back to work:** How to use RRDtool directly to handle time-series data in the networking area.

**Topics include:**

- RRDtool overview
- The RRD database format
- How to set up an RRD performance test
- RRD graphing
- Putting it together

## T5 Advanced Shell Programming

Mike Ciavarella, Consultant

**Who should attend:** Junior or intermediate sysadmins or anyone with a basic knowledge of programming, preferably with some experience in Bourne/Korn shells (or their derivatives).

**Take back to work:** The information needed to immediately implement, extend, and manage popular monitoring tools on your systems and networks.

**Topics include:**

- Modular shell script programming
- Writing secure shell scripts
- Performance tuning
- Addressing portability at the design stage

## T6 Disk-to-Disk Backup and Eliminating Backup System Bottlenecks

★UPDATED FOR 2008

Jacob Farmer, Cambridge Computer Services

**Who should attend:** Sysadmins involved in the design and management of backup systems and policymakers responsible for protecting their organization's data. The class focuses on architectures and core technologies and is relevant regardless of what backup hardware and software you currently use.

**Take back to work:** Ideas for immediate, effective, inexpensive improvements to your backup systems.

**Topics include:**

- Conventional disk staging
- Virtual tape libraries, removable disk media, iSCSI
- Information lifecycle management and nearline archiving
- Data replication
- CDP (Continuous Data Protection)
- Capacity Optimization (Single-Instance File Systems)
- Minimizing or eliminating tape drives

## T7 Recovering from Linux Hard Drive Disasters

Theodore Ts'o, *IBM/Linux Foundation*

**Who should attend:** Linux system administrators and users.

**Take back to work:** How to recover from storage disasters caused by failures somewhere in the hardware or software stack.

**Topics include:**

- How data is stored on hard drives
- Recovering from a corrupted partition table
- Recovering from failed software RAID systems
- Low-level techniques to recover data from a corrupted ext2/ext3 filesystem when backups aren't available
- Using e2image to back up critical ext2/3 filesystem metadata
- Using e2fsck and debugfs to sift through a corrupted filesystem
- Preventive measures to avoid needing to use heroic measures

## T8 Integrating Cfengine into Organizational Service Management ★NEW

Mark Burgess, *Oslo University College*

**Who should attend:** Those wanting an overview of Cfengine concepts for business issues, with implementation examples.

**Take back to work:** How to evaluate the principles used in configuring hosts and devices, relate them to standards, and apply them to your own environments.

**Topics include:**

- Cfengine policy management
- Incident management
- Change management
- Release management
- Availability and capacity management
- Security management
- Role-based access control

## T9 Reinventing Yourself ★NEW

Marcus Ranum, *Consultant*

**Who should attend:** Anyone who feels stuck in their career slot, who is contemplating a jump to something new, who wants to grow to the next level, and who needs a little help figuring out how to get from here to there.

**Take back to work:** Effective techniques to make a career transition and help in finding the path to becoming notable in your own (and your boss's) eyes!

**Topics include:**

- Reinventing yourself: why and wherefore?
- Defining success and making a roadmap
- Finding mentors
- Broadening your horizons
- Jumping out of planes without parachutes

Half Day Afternoon (1:30 p.m.–5:00 p.m.)

## T10 Nagios: Advanced Topics

John Sellens, *SYONEX*

**Who should attend:** Network and system administrators ready to implement or extend their use of the Nagios system and network monitoring tool.

**Take back to work:** The information you need to immediately implement and use Nagios and related tools for monitoring systems and devices on your networks.

**Topics include:**

- Functionality, features, use, and application
- Installation
- Theory of operation
- Plug-ins, extensions, and add-ons

## T11 Writing JavaScript Applications Running in the Browser with Qooxdoo ★NEW

Tobias Oetiker, *Consultant*

**Who should attend:** People with a good grasp of programming who would like to put the fun back into writing Web applications with fully interactive interfaces.

**Take back to work:** How to use Qooxdoo to write a Web application where the server part is only a few lines of Perl or PHP code, essentially grabbing data off your database without having to care about presentation or the front end in general.

**Topics include:**

- Setting up a Qooxdoo programming environment on your laptop
- Building a Qooxdoo Hello World application
- Talking to the server
- Creating your own widgets
- Writing new and complex widgets
- Code walkthrough of a real-world Qooxdoo application

## T12 Documentation Techniques for Sysadmins

Mike Ciavarella, *Consultant*

**Who should attend:** Sysadmins who need to produce documentation for the systems they manage or who want to improve their documentation skills.

**Take back to work:** The ability to make immediate, practical use of the techniques presented in this tutorial in your day-to-day tasks.

**Topics include:**

- The document life cycle
- Targeting your audience
- An adaptable document framework
- Tools to assist in documentation

TUESDAY CONTINUES ON P. 10

Half Day Afternoon (1:30 p.m.–5:00 p.m.)  
*continued from p. 9*

## T13 Next-Generation Storage

**Networking** ★**UPDATED FOR 2008**

Jacob Farmer, *Cambridge Computer Services*

**Who should attend:** Sysadmins running day-to-day operations and those who set or enforce budgets.

**Take back to work:** An understanding of general architectures, various approaches to scaling in both performance and capacity, relative costs of different technologies, and strategies for achieving results on a budget.

**Topics include:**

- The latest storage interfaces
- Content-Addressable Storage (CAS)
- Information Life Cycle Management (ILM) and Hierarchical Storage Management (HSM)
- High-performance file sharing

## T14 An Introduction to SystemTap ★**NEW**

Theodore Ts'o, *IBM/Linux Foundation*

**Who should attend:** Linux Kernel developers and advanced system administrators. Familiarity with Linux kernel internals is extremely helpful.

**Take back to work:** How to install and run SystemTap on your Linux systems and write basic SystemTap scripts and tapsets.

**Topics include:**

- How to get the latest version of SystemTap
- Managing kernel debuginfo files
- Programming SystemTap scripts
- How to create tapsets
- Examples of SystemTap in action

## T15 Cfengine 3 ★**NEW**

Mark Burgess, *Oslo University College*

**Who should attend:** Anyone with a basic knowledge of configuration management who is interested in learning the next-generation tool.

**Take back to work:** An understanding of the new features of the completely

rewritten Cfengine 3, including its new syntax and benefits.

**Topics include:**

- The promise model
- Bundles and templates
- Quickstart configuration
- Creating configuration libraries
- Upgrading from Cfengine 2

## T16 Incident Response ★**NEW**

Abe Singer, *San Diego Supercomputer Center*

**Who should attend:** Security folks, sysadmins, and operations staff (e.g., help desk). Examples are primarily from UNIX systems, but most of what is discussed will be OS neutral. Note that this is *not* a forensics class (for those, see S4 and M3). Although some forensic analysis will be discussed, it is only a small portion of the class.

**Take back to work:** How to put together a comprehensive incident response program, from identifying the policies and tools you need to assessing the situation and determining an effective, measured response.

**Topics include:**

- Goals: What results do you want?
- Policies: Having the authority to do the job
- Tools: Having the stuff to do the job
- Intelligence: Having the information to do the job
- Initial suspicion: Complaints, alarms, anomalies
- The “Oh, sh\*t” moment: When you realize it’s a compromise
- Gathering information on your attacker
- Assessing the extent of the compromise
- Communicating: Inquiring minds want to know
- Recovery: Kicking ‘em out and fixing the damage
- Evidence handling
- The law: Dealing with law enforcement, lawyers, and HR

## ATTENTION MANAGERS: WHY YOU SHOULD SEND YOUR EMPLOYEES TO LISA '08

Hiring the best and the brightest is the ultimate goal for any employer. However, keeping current employees up to par is just as important. Technology continues to evolve. To stay ahead of the game, your employees must continue to enhance their skills.

The training program at LISA '08 offers a cost-effective, one-stop shop for training current IT and development employees. Over 55 full- and half-day tutorials taught by the most respected leaders in the field provide an unparalleled opportunity to learn from the best. Tutorials cover a multitude of system administration topics including open source technologies, security, and defeating spam.

New in 2008, the two training series on Solaris and virtualization provide your employees with the opportunity for more focused training on two of today's most important topics.

Combining days of training with days of technical sessions on groundbreaking research related to system and network administration makes the LISA '08 experience even more valuable. Additionally, the evening receptions and BoF sessions provide your staff with a chance to network with peers and industry leaders to gain that all-important “insider” IT knowledge that will keep your company current and running smoothly.

Keeping up with technology can be costly and time-consuming in this unforgiving economy: take full advantage of this opportunity to have your staff learn from the top researchers, practitioners, and authors all in one place, at one time.

Full Day (9:00 a.m.–5:00 p.m.)

**W1 Virtualization with VMware ESX 3i for UNIX Administrators: Advanced Topics**



John Arrasjid and Shridhar Deuskar, *VMware*

**Who should attend:** System administrators and architects who are interested in advanced topics on deploying a VMware infrastructure.

**Take back to work:** How to build on your experience with VMware Infrastructure to better support a VI3 environment.

**Topics include:**

- Best practices with ESX
- New and/or advanced concepts with networking
- New and/or advanced concepts with storage
- Storage VMotion
- VMware Site Recovery Manager

**W2 Building Web Interfaces with PHP and SQL ★NEW**

Marcus Ranum, *Consultant*

**Who should attend:** System and network administrators who are interested in using Web-based interfaces to automate reporting or command/control systems; site designers and managers.

**Take back to work:** The basics of PHP scripting, forms, connecting to databases, and outputting results.

**Topics include:**

- PHP programming constructs
- Outputting pages
- Input fields
- Protecting logins and sessions
- Graphics

Half Day Morning (9:00 a.m.–12:30 p.m.)

**W3 Solaris 10 Administration Workshop 1: Administration (Hands-on) ★NEW**



Peter Baer Galvin, *Corporate Technologies*; Marc Staveley, *Soma Networks*

**Who should attend:** Solaris systems managers and administrators interested in learning the new administration features in Solaris 10.

**Take back to work:** Intimate knowledge of the new features and best practices surrounding Solaris 10 administration.

**Topics include:**

- Solaris versions and features
- SMF and FMA
- Booting and installing
- Patching
- Important administration tools
- What's next for Solaris
- Quick performance overview

**W4 Achieving High Availability (in Your Lifetime)**

Evan Marcus, *GDCM*

**Who should attend:** Sysadmins and data center managers, developers and their managers, and IT managers.

**Take back to work:** Simple and practical tools you can use right away to persuade the bean counters in your organization of the value of putting high availability techniques and practices into place.

**Topics include, in reference to high availability:**

- Backups and restores
- Security
- Networking
- WANs and replication

**W5 Beyond Shell Scripts: 21st-Century Automation Tools and Techniques**

Aleen Frisch, *Exponential Consulting*

**Who should attend:** Sysadmins who want to explore new ways of automating administrative tasks.

**Take back to work:** The ability to monitor and maintain more information on more systems without drastically increasing your workload.

**Topics include:**

- Automating interactive processes
- Open source enterprise backup tools: Bacula and Amanda
- Network and system monitoring tools
- Proactive security monitoring

Half Day Afternoon (1:30 p.m.–5:00 p.m.)

**W6 Solaris 10 Administration Workshop 2: Virtualization (Hands-on) ★NEW**



Peter Baer Galvin, *Corporate Technologies*; Marc Staveley, *Soma Networks*

**Who should attend:** Solaris systems managers and administrators interested in learning the new virtualization features in Solaris 10.

**Take back to work:** Knowledge of the Solaris 10 virtualization choices.

**Topics include:**

- Zones/containers
- LDOMS and domains
- Virtualbox
- xvm (a.k.a. Xen)

**W7 Disaster Preparedness (and Recovery): How to Keep Your Company (and Your Job) Alive**

Evan Marcus, *GDCM*

**Who should attend:** Data center managers, IT directors, and anyone who needs to avoid extended downtime after an outage.

**Take back to work:** The ability to put together a plan that fits your company.

**Topics include:**

- What a plan should contain, how much it costs, and how to test it
- Building and staffing DR teams
- Senior management's role

**W8 DNS and DHCP Considerations When Migrating to IPv6 ★NEW**

Peter Loshier, *Internet Systems Consortium*

**Who should attend:** System and/or network administrators who need to add IPv6 to their enterprise networks.

**Take back to work:** The ability to acquire an IPv6 prefix, get it routed, and configure your DNS and DHCP infrastructure to use IPv6.

**Topics include:**

- Making addressing plans for IPv6
- Assigning IPv6 addresses
- Coordinating DNS and DHCP

Full Day (9:00 a.m.–5:00 p.m.)

## R1 Securing Virtual Servers: XenServer and VMware ESX Server ★NEW



Phil Cox, *SystemExperts Corporation*

**Who should attend:** Site managers charged with selecting and setting virtual server security requirements, general users who want to know more about the security features of popular virtual environments, and sysadmins who are tasked with implementing or maintaining the security of virtual servers.

**Take back to work:** Familiarity with current virtualization and popular technical implementations of it, as well as an understanding of how to secure virtual servers that use these technologies.

**Topics include:**

- Virtualization 101
- Threats
- Popular technologies
- What's coming next

## R2 So You Have Active Directory: Now What? A Field Guide to AD Integration for UNIX Sysadmins

Gerald Carter, *Likewise Software*

**Who should attend:** Sysadmins who are tasked with integrating authentication, file, print, and Web services on Linux/UNIX/Mac hosts into an AD domain.

**Take back to work:** In-depth understanding of the best approaches to managing your system services with Active Directory.

**Topics include:**

- How to utilize standard protocols and open source tools to integrate Linux, UNIX, and Mac clients/servers into AD domains for authentication
- Restricting logon access based on AD domain group membership
- Providing roaming, offline logons for Linux laptops using cached AD credentials

- Configuring Samba file and print servers to authenticate AD domain users
- Defining access control lists on files and directories using AD domain accounts and groups
- Configuring Apache Web servers to provide seamless access to intranet Web content using common authentication protocols such as NTLM and Kerberos
- Writing Perl scripts to automate daily AD administrative tasks from non-Microsoft desktops

Half Day Morning (9:00 a.m.–12:30 p.m.)

## R3 Solaris 10 Administration Workshop 3: File Systems (Hands-on) ★NEW



Peter Baer Galvin, *Corporate Technologies*; Marc Staveley, *Soma Networks*

**Who should attend:** Solaris systems managers and administrators interested in learning the new file system features in Solaris 10.

**Take back to work:** Knowledge of the Solaris 10 file system choices and best practices surrounding Solaris 10 administration.

**Topics include:**

- Root disk layout
- Mirroring et al.
- ZFS
- Choosing the most appropriate file system

## R4 Over the Edge System Administration, Volume 1

David N. Blank-Edelman, *Northeastern University*

**Who should attend:** Old-timers who think they've seen it all, and those who want to develop inventive thinking.

**Take back to work:** New approaches to old problems, along with some ways to solve the insolubles.

**Topics include:**

- How to increase user satisfaction during downtimes, with 6 lines of Perl

- How to improve your network services by throwing away data
- How to drive annoying Web-only applications without lifting a finger
- How to use ordinary objects, such as Silly Putty, to make your life easier

Half Day Afternoon (1:30 p.m.–5:00 p.m.)

## R5 Solaris 10 Administration Workshop 4: Security (Hands-on) ★NEW



Peter Baer Galvin, *Corporate Technologies*; Marc Staveley, *Soma Networks*

**Who should attend:** Solaris systems managers and administrators interested in the new security features in Solaris 10.

**Take back to work:** Knowledge of the new features in Solaris 10 for addressing the entire security infrastructure, as well as new issues to consider when deploying, implementing, and managing Solaris 10.

**Topics include:**

- RBAC: Role Based Access Control
- Privileges
- NFSv4
- Flash archives and live upgrade
- DTrace
- Auditing enhancements
- BSM: Basic Security Module
- Solaris Cryptographic Framework

## R6 Over the Edge System Administration, Volume 2

David N. Blank-Edelman, *Northeastern University*

**Who should attend:** Old-timers who think they've seen it all, and those who want to develop inventive thinking.

**Take back to work:** Approaches to system administration you never dreamed of—but you wish you had!

**Topics include:**

- How to benefit from side effects
- Arts and crafts for sysadmins
- Web apps as sysadmin tools

Full Day (9:00 a.m.–5:00 p.m.)

F1 VMware ESX Performance and

Tuning ★NEW



Richard McDougall, VMware

**Who should attend:** Anyone who is involved in planning or deploying virtualization on VMware ESX and wants to understand the performance characteristics of applications in a virtualized environment.

**Take back to work:** How to plan, understand, characterize, diagnose, and tune for best application performance on VMware ESX.

**Topics include:**

- Hardware acceleration techniques
- Diagnosing performance using VMware tools or guest OS tools in a virtual environment
- Practical limits and overheads
- Storage performance
- Network throughput and options
- Using Virtual SMP
- Guest operating system types
- Characteristics of Oracle, MS SQLserver, and MS Exchange
- Capacity planning techniques

F2 Resource Management with Solaris Containers



Jeff Victor, Sun Microsystems

**Who should attend:** System administrators who want to improve resource utilization of their Solaris (SPARC, x64, and x86) systems.

**Take back to work:** A solid understanding of the facilities and commands available for maximizing usage of the Solaris systems in your data center.

**Topics include:**

- What are resources and why would you want to manage them?
- How do you use Solaris features such as Dynamic Resource Pools, Resource Capping and Memory Sets, IPQoS, Schedulers, and Zones?
- Projects and Tasks

F3 Implementing [Open]LDAP Directories

Gerald Carter, *Likewise Software*

**Who should attend:** Both LDAP directory administrators and architects.

**Take back to work:** Comfort with LDAP terms and concepts and an understanding of how to extend that knowledge to integrate future applications using LDAP into your network.

**Topics include:**

- Replacing an NIS domain with an LDAP directory
- Integrating Samba domain file and print servers
- Integrating MTAs such as Sendmail and Postfix
- Creating customized LDAP schema items
- Examining scripting solutions for developing your own directory administration tools

F4 Practical Python for System Administrators ★NEW

Steve Holden, *Holden Web*

**Who should attend:** System administrators looking for scripting tools to assist them in performing more complex system administration tasks. Python experience is not necessary, but familiarity with scripting would be useful.

**Take back to work:** Familiarity with Python's features; how to solve practical administration problems and how to adapt existing scripts and write your own.

**Topics include:**

- Generator functions
- Iteration protocol and properties
- Database API
- Graphical capabilities

CONTINUING EDUCATION UNITS (CEUS)

USENIX provides Continuing Education Units for a small additional administrative fee. The CEU is a nationally recognized standard unit of measure for continuing education and training and is used by thousands of organizations.

Each full-day tutorial qualifies for 0.6 CEUs. You can request CEU credit by completing the CEU section on the registration form. USENIX provides a certificate for each attendee taking a tutorial for CEU credit and maintains transcripts for all CEU students. CEUs are not the same as college credits. Consult your employer or school to determine their applicability.

OUR GUARANTEE

If you're not happy, we're not happy. If you feel a tutorial does not meet the high standards you have come to expect from USENIX, let us know by the first break and we will change you to any other available tutorial immediately.

WANT MORE INFO?

See [www.usenix.org/lisa08/training](http://www.usenix.org/lisa08/training) for comprehensive tutorial descriptions, including full topics lists and prerequisites.



# TRAINING SERIES: VIRTUALIZATION AND SOLARIS

## NEW IN 2008! TRAINING SERIES ON VIRTUALIZATION AND SOLARIS

LISA now offers two 6-day series of classes, focusing on some of the most important topics you'll encounter. Is the latest virtualization information key to your job success? Looking for in-depth training on Solaris? Enroll and learn all you need to get the job done. You'll save time by getting your specialized training in one place and you'll save money—\$100 off the regular 6-day training package price! The tutorials included in each series are listed below. See pp. 4–13 for descriptions of the tutorials in each series, which are denoted by icons.



### Virtualization Series

#### SUNDAY, NOVEMBER 9

- S1 Virtualization! What's It Good For?  
Eleen Frisch and Kyrre Begnum

#### MONDAY, NOVEMBER 10

- M1 Introduction to the Open Source Xen Hypervisor  
Stephen Spector, Wenjin Hu, and Zach Shepherd

#### TUESDAY, NOVEMBER 11

- T1 Virtualization with VMware ESX 3i for UNIX Administrators:  
The Fundamentals  
John Arrasjid and Shridhar Deuskar

#### WEDNESDAY, NOVEMBER 12

- W1 Virtualization with VMware ESX 3i for UNIX Administrators:  
Advanced Topics  
John Arrasjid and Shridhar Deuskar

#### THURSDAY, NOVEMBER 13

- R1 Securing Virtual Servers: XenServer and VMware ESX Server  
Phil Cox

#### FRIDAY, NOVEMBER 14

- F1 VMware ESX Performance and Tuning  
Richard McDougall

### Solaris Series

#### SUNDAY, NOVEMBER 9

- S2 Solaris 10 Performance, Observability, and Debugging  
James Mauro

#### MONDAY, NOVEMBER 10

- M2 System and Network Performance Tuning  
Marc Staveley

#### TUESDAY, NOVEMBER 11

- T2 Solaris Dynamic Tracing: DTrace  
James Mauro

#### WEDNESDAY, NOVEMBER 12

- W3 Solaris 10 Administration Workshop 1: Administration  
(Hands-on)  
Peter Baer Galvin and Marc Staveley
- W6 Solaris 10 Administration Workshop 2: Virtualization  
(Hands-on)  
Peter Baer Galvin and Marc Staveley

#### THURSDAY, NOVEMBER 13

- R3 Solaris 10 Administration Workshop 3: File Systems  
(Hands-on)  
Peter Baer Galvin and Marc Staveley
- R5 Solaris 10 Administration Workshop 4: Security  
(Hands-on)  
Peter Baer Galvin and Marc Staveley

#### FRIDAY, NOVEMBER 14

- F2 Resource Management with Solaris Containers  
Jeff Victor

# TRAINING INSTRUCTORS



**John Arrasjid**

**T1, W1**

John Arrasjid has 20 years of experience in the computer science field. His experience includes work with companies such as AT&T, Amdahl, 3Dfx Interactive, Kubota Graphics, Roxio, and his own company, WebNexus Communications, where he developed consulting practices and built a cross-platform IT team. John is currently a senior member of the VMware Professional Services Organization as a Consulting Architect. John has developed a number of PSO engagements, including Performance, Security, and Disaster Recovery and Backup. John is the Worldwide BC/DR Practice lead in VMware's Professional Services group. He is co-author of the SAGE Short Topics booklet *Deploying the VMware Infrastructure*.



**Kyrre Begnum**

**S1**

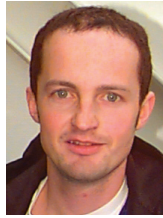
Kyrre Begnum is currently completing his Ph.D. in Network and System Administration at Oslo University College in Norway. Part of his research focuses on managing virtual infrastructures, and he is the author of the Manage Large Networks (MLN) VM administrative tool.



**David N. Blank-Edelman**

**R4, R6**

David N. Blank-Edelman is the Director of Technology at the Northeastern University College of Computer and Information Science and the author of the O'Reilly book *Perl for System Administration*. He has spent the past 20+ years as a system/network administrator in large multi-platform environments, including Brandeis University, Cambridge Technology Group, and the MIT Media Laboratory. He was the program chair of LISA '05 and was one of the LISA '06 Invited Talks co-chairs.



**Mark Burgess**

**T8, T15**

Mark Burgess is Professor of Network and System Administration at Oslo University College, Norway (a member of the EMANICS Network of Excellence). He is the author of the configuration management system Cfengine and of several books and many papers on the topic, including the SAGE Short Topics booklet *A System Engineer's Guide to Host Configuration and Maintenance Using Cfengine*, coauthored with Aileen Frisch.



**Gerald Carter**

**M11, R2, F3**

Gerald Carter has been a member of the Samba Development Team since 1998. He has been developing, writing about, and teaching on open source since the late 1990s. He authored *LDAP System Administration* and the third edition of *Using Samba* for O'Reilly Publishing. Currently Jerry is employed by Likewise Software as a Samba and open source developer.



**Tom Christiansen**

**S7, S10, M7**

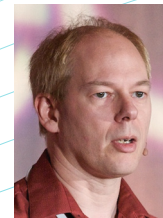
Tom Christiansen has been involved with Perl since day zero of its initial public release in 1987. Author of several books on Perl, including the *Perl Cookbook* and *Programming Perl* from O'Reilly, Tom is also a major contributor to Perl's online documentation. He holds undergraduate degrees in computer science and Spanish and a Master's in computer science. He now lives in Boulder, Colorado.



**Mike Ciavarella**

**M5, T5, T12**

Mike Ciavarella has been producing and editing technical documentation since he naively agreed to write application manuals for his first employer in the early 1980s. He has been a technical editor for Macmillan Press and has been teaching system administrators about documentation for the past eight years. Mike has an Honours Degree in Science from the University of Melbourne. After a number of years working as Senior Partner and head of the Security Practice for Cybersource Pty Ltd, Mike returned to his alma mater, the University of Melbourne. He is now an independent consultant. In his ever-diminishing spare time, Mike is a caffeine addict and photographer.



**Adrian Cockcroft**

**S3**

Adrian Cockcroft is well known as a Distinguished Engineer at Sun Microsystems and eBay Research Labs and is currently Director of Web Engineering at Netflix. Author of four books on performance tuning and capacity planning, he has been inspired by his involvement in the Homebrew Mobile Phone club to invent the term "Millicomputing" and apply ultra low power devices to enterprise computing applications.

# TRAINING INSTRUCTORS



**Phil Cox**

**R1**

Phil Cox is a Principal Consultant of SystemExperts Corporation, a consulting firm that specializes in system security and management. He is a well-known authority in the areas of system integration and security. His experience includes Windows, UNIX, and IP-based networks integration, firewall design and implementation, and ISO 17799 and PCI compliance. He frequently writes and lectures on issues dealing with heterogeneous system integration and compliance with PCI-DSS. He is the lead author of *Windows 2000 Security Handbook 2nd Edition* (Osborne McGraw-Hill) and contributing author for *Windows NT/2000 Network Security* (Macmillan Technical Publishing). He holds a BS in Computer Science from the College of Charleston.



**Lee Damon**

**M5**

Lee Damon has a BS in Speech Communication from Oregon State University. He has been a UNIX system administrator since 1985 and has been active in SAGE and LOPSA since their inception. He assisted in developing a mixed AIX/SunOS environment at IBM T.J. Watson Research Center and has developed mixed environments for Gulfstream Aerospace and QUALCOMM. He is currently leading the development effort for the Nikola project at the University of Washington Electrical Engineering department. Among other professional activities, he is a charter member of LOPSA and SAGE and past chair of the SAGE Ethics and Policies working groups, and he was the chair of LISA '04.



**Shridhar Deuskar**

**T1, W1**

Shridhar Deuskar is an experienced professional in the IT industry. He has over 10 years of experience in system administration of UNIX and Windows servers. He has consulted with companies such as Caterpillar, HP, and EMC. Currently he is a Consulting Architect in VMware's Professional Services organization and is responsible for delivering services tied to virtualization to clients worldwide.



**Jacob Farmer**

**T6, T13**

Jacob Farmer is a well-known figure in the data storage industry. He has written numerous papers and articles and is a regular speaker at trade shows and conferences. In addition to his regular expert advice column in the "Reader I/O" section of *InfoStor Magazine*, the leading trade magazine of the data storage industry, Jacob also serves as the publication's senior technical advisor. Jacob has over 18 years of experience with storage technologies and is the CTO of Cambridge Computer Services, a national integrator of data storage and data protection solutions.



**Rik Farrow**

**M8**

Rik Farrow has been teaching UNIX security classes since 1987. He wrote the second book on UNIX security, as well as hundreds of security-related articles. His experience with Linux security goes back over ten years and has led him to believe that sandboxing applications with SELinux is not just a good idea, but necessary. Rik Farrow is also editor of *login*.



**Aileen Frisch**

**S1, M4, W5**

Aileen Frisch has been working as a system administrator for over 20 years. She currently looks after a pathologically heterogeneous network of UNIX and Windows systems. She is the author of several books, including *Essential System Administration* (now in its 3rd edition) and the SAGE Short Topics booklet *A System Engineer's Guide to Host Configuration and Maintenance Using Cfengine*, coauthored with Mark Burgess. Aileen was the program committee chair for LISA '03 and is a frequent presenter at USENIX and SAGE events, as well as presenting classes for universities and corporations worldwide.



**Peter Baer Galvin**

**W3, W6, R3, R5**

Peter Baer Galvin is the Chief Technologist for Corporate Technologies, Inc., a systems integrator and VAR. Previously he was the Systems Manager for Brown University's Computer Science Department. Peter is currently a columnist for *login*. He has written articles for *Byte* and other magazines, as well as columns for *SunWorld* and *Sys Admin* magazines. Peter is co-author of the *Operating Systems Concepts* and *Applied Operating Systems Concepts* textbooks. As a consultant and trainer, Peter has taught tutorials on security and system administration and has given talks at many conferences and institutions on such topics as Web services, performance tuning, security, system administration, and high availability.



**Simson L. Garfinkel**

**S4, M3**

Simson L. Garfinkel is an Associate Professor at the Naval Postgraduate School in Monterey, CA, and a fellow at the Center for Research on Computation and Society at Harvard University. He is also the founder of Sandstorm Enterprises, a computer security firm that develops advanced computer forensic tools used by businesses and governments to audit their systems. Garfinkel has research interests in computer forensics, the emerging field of usability and security, information policy, and terrorism. He has actively researched and published in these areas for more than two decades. He writes a monthly column for *CSO Magazine*, for which he has been awarded four national journalism awards, and is the author or co-author of fourteen books on computing. He is perhaps best known for *Database Nation: The Death of Privacy in the 21st Century* and for *Practical UNIX and Internet Security*.



**Geoff Halprin**

**S8, S11, M6**

Geoff Halprin has spent over 30 years as a software developer, system administrator, consultant, and troubleshooter. He has written software from system management tools to mission-critical billing systems, has built and run networks for enterprises of all sizes, and has been called upon to diagnose problems in every aspect of computing infrastructure and software. He is the author of the System Administration Body of Knowledge (SA-BOK) and the SAGE Short Topics booklet *A System Administrator's Guide to Auditing*, and was the recipient of the 2002 SAGE-AU award for outstanding contributions to the system administration profession. Geoff has served on the boards of SAGE, SAGE-AU, USENIX, and LOPSA. He has spoken at over 20 conferences in Australia, New Zealand, Canada, Europe, and the U.S.



**Steve Holden**

**F4**

Steve Holden is the author of *Python Web Programming* and the chairman of the Python Software Foundation. His interest in object-oriented programming extends back to the original SmallTalk implementation, but after he discovered Python ten years ago he made it his language of choice for most programming tasks. Steve has over twenty years of experience as an instructor and teacher. He consults for government agencies and private corporations and is a contributing editor for *Python Magazine*.



**Wenjin Hu**

**M1**

Wenjin Hu is a graduate student at Clarkson University. He is the author of the network chapter in the book *Running Xen: A Hands-on Guide to the Art of Virtualization*. While at Clarkson, Wenjin has investigated a lot of different virtualization systems and coauthored an academic paper entitled "Quantifying the Performance Isolation Properties of Virtualization Systems." For his PhD research, he focuses on Xen virtualization and file systems, trying to apply the techniques in those two fields to provide a more secure and reliable desktop environment for common users. Currently, he is also tackling Solaris xVM and writing an introductory article for *login*.



**Peter Loshier**

**W8**

Peter Loshier is a Senior System Administrator at Internet Systems Consortium (ISC), which has run native dual-stack IPv6 on its servers and networks for a long time. He is one of the administrators of the F-Root servers and had primary responsibility for converting F-Root to be IPv6-compatible. He has more than 5 years of experience operating IPv6 on servers and networks. Try `traceroute6 www.isc.org` and see whether you have connectivity to ISC's Web server.



**Evan Marcus**

**W4, W7**

Evan joined Global Data Center Management (GDCM) as the Lead Sales Engineer for North America in 2007. He has more than 20 years of experience on UNIX systems. Before joining GDCM, he spent 8 years at VERITAS Software as a systems engineer, speaker, and author. He also spent 5 years at Sun Microsystems and 2+ years at Fusion Systems, where he worked to bring the first high availability software applications for SunOS and Solaris to market. He also spent two years as a system administrator on the equities trading floor of a multinational trading institution. He is the co-author of *Blueprints for High Availability*, 2nd edition (John Wiley & Sons, 2003) and coauthor and co-editor of *The Resilient Enterprise* (VERITAS Publications, 2002). He is a well-regarded and popular speaker on the design of highly available and disaster-resilient systems and on fixed-content storage archives.

# TRAINING INSTRUCTORS



**James Mauro**

**S2, T2**

James Mauro is a Senior Staff Engineer in the Performance and Availability Engineering group at Sun Microsystems. Jim's current interests and activities are centered on benchmarking Solaris 10 performance, workload analysis, and tool development. This work includes Sun's new Opteron-based systems and multicore performance on Sun's Chip Multithreading (CMT) Niagara processor. Jim resides in Green Brook, New Jersey, with his wife and two sons. He spent most of his spare time in the past year working on the second edition of *Solaris Internals*. Jim coauthored the first edition of *Solaris Internals* with Richard McDougall and has been writing about Solaris in various forums for the past nine years.



**Richard McDougall**

**F1**

Richard McDougall is a Principal Engineer and the Chief Performance Architect in the Office of the CTO at VMware. A recognized expert in operating systems, virtualization, performance, resource management, and filesystem technologies, Richard is a frequent speaker and has published several papers and books on these topics. Prior to VMware, most recently he was a Distinguished Engineer at Sun Microsystems, where he wrote the authoritative books *Solaris Internals* and *Solaris Performance and Tools*.



**Tobias Oetiker**

**M9, M12, T4, T11**

Tobias Oetiker is an electrical engineer by education and a system administrator by vocation. For ten years he has been working for the Swiss Federal Institute of Technology in Zurich, providing students and staff with a deluxe UNIX workstation environment. In 2006 he started his own company, OETIKER+PARTNER AG, running UNIX servers for industry customers, improving his pet open source projects MRTG, RRDtool, and SmokePing, and applying these tools to solve the customers' problems. These days, Tobias uses a SunRay appliance running off a diskless, Ubuntu-based SunRay server as his personal workstation environment. In 2006, Tobias received the prestigious SAGE Outstanding Achievement Award for his work on MRTG and RRDtool.



**Marcus Ranum**

**T9, W2**

Marcus Ranum has been building and designing security and security systems since 1989. He is the author of several books on security and has been, variously, network manager, C programmer, development team leader, VP of engineering, CSO, CEO, and consultant. He is currently the CSO of Tenable Network Security.



**John Sellens**

**M10, T3, T10**

John Sellens has been involved in system and network administration since 1986 and is the author of several related USENIX papers, a number of *login*: articles, and the SAGE Short Topics booklet #7, *System and Network Administration for Higher Reliability*. He holds an MMath in computer science from the University of Waterloo and is a Chartered Accountant. He is the proprietor of SYONEX, a systems and networks consultancy, and is currently a member of the systems team at Magna International. From 1999 to 2004, he was the General Manager for Certainty Solutions in Toronto. Prior to joining Certainty, John was the Director of Network Engineering at UUNET Canada and was a staff member in computing and information technology at the University of Waterloo for 11 years.



**Zach Shepherd**

**M1**

Zach Shepherd is an undergraduate student studying computer science, physics, and mathematics at Clarkson University. At Clarkson, he has collaborated with students and professors on various Xen-related projects, including the setup of a Xen-based infrastructure for the Clarkson Open Source Institute and research in virtualization benchmarking. Zach was a technical reviewer for *Running Xen: A Hands-on Guide to the Art of Virtualization*.



**Abe Singer**

**S6, S9, T16**

Abe Singer is a Computer Security Researcher in the Security Technologies Group at the San Diego Supercomputer Center.

In his operational security responsibilities, he participates in incident response and forensics and in improving the SDSC logging infrastructure. His research is in pattern analysis of syslog data for data mining. He is also the author of the SAGE Short Topics booklet *Building a Logging Infrastructure*, and a soon to be released O'Reilly book on log analysis.



**Stephen Spector**

**M1**

Stephen Spector brings more than 15 years' experience in software engineering, product marketing, and developer and alliance

marketing programs to the Xen.org community as the current community program manager. He has spent more than 10 years at Citrix, founding the Citrix Developer Network and supporting the release of the first Windows CE 1.0 client, as well as working on various marketing and alliance programs. He has previously held various positions at Turbolinux, Racal Datacom, and Siemens. Stephen holds an MBA from Florida Atlantic University, an MS in computer science from the University of Florida, and a BS in computer engineering from The Ohio State University.



**Marc Staveley**

**M2, W3, W6, R3, R5**

Marc Staveley now works with Soma Networks, where he is applying his many years of experience with UNIX development

and administration to leading their IT group. Previously Marc had been an independent consultant and also held positions at Sun Microsystems, NCR, Princeton University, and the University of Waterloo. He is a frequent speaker on the topics of standards-based development, multi-threaded programming, system administration, and performance tuning.



**Theodore Ts'o**

**S5, T7, T14**

Theodore Ts'o has been a Linux kernel developer since almost the very beginnings of Linux: he implemented POSIX job

control in the 0.10 Linux kernel. He is the maintainer and author of the Linux COM serial port driver and the Comtrol Rocketport driver, and he architected and implemented Linux's tty layer. Outside of the kernel, he is the maintainer of the e2fsck filesystem consistency checker. Ted is currently employed by IBM Linux Technology Center.



**Jeff Victor**

**F2**

Jeff Victor has been using UNIX systems since 1984. His two-decade career has included software design and development, network

and telecomm administration, and ten years as a Systems Engineer at Sun Microsystems. Jeff wrote the Sun BluePrint "Solaris Containers Technology Architecture Guide" and the "How to Move a Container" guide, both available at <http://www.sun.com>. He also maintains the Solaris Zones and Containers FAQ at <http://opensolaris.org>. Jeff holds a BS in computer science from Rensselaer Polytechnic Institute.



**Elizabeth Zwicky**

**S8, S11**

Elizabeth Zwicky has been managing system administrators off and on since her first job. Recently, she's been hanging out with

educational theorists and testing ways of teaching problem solving to system administrators, high-school graduates who may or may not have any interest in system administration but are being paid to listen, and a four-year-old.

# TECHNICAL SESSIONS

8:45 A.M.–10:30 A.M.

## Opening Remarks, Awards, Keynote



### Keynote Address

#### Implementing Intellipedia Within a “Need to Know” Culture

Sean Dennehy, *Chief of Intellipedia Development, Directorate of Intelligence, U.S. Central Intelligence Agency*

Sean will share the technical and cultural changes underway at the CIA involving the adoption of wikis, blogs, and social bookmarking tools. In 2005, Dr. Calvin Andrus published *The Wiki and The Blog: Toward a Complex Adaptive Intelligence Community*. Three years later, a vibrant and rapidly growing community has transformed how the CIA aggregates, communicates, and organizes intelligence information. These tools are being used to improve information sharing across the U.S. intelligence community by moving information out of traditional channels.

Sean Dennehy was the pilot customer for Intellipedia and has since become a leading change agent for incorporating Enterprise 2.0 solutions into the intelligence community’s business practices. He has developed an innovative “sabbatical” program that introduces intelligence community officers to the numerous Web 2.0 applications that are being deployed across the intelligence community. The focus of his efforts is encouraging a viral adoption where officers replace existing processes to take advantage of network effects encountered when individuals move projects out of “channels” and onto “platforms.”

11:00 A.M.–12:30 P.M.

## REFEREED PAPERS

### Think About It (Meta-Admin and Theory)

#### Designing Tools for System Administrators: An Empirical Test of the Integrated User Satisfaction Model

Nicole F. Velasquez, Suzanne Weisband, and Alexandra Durcikova, *University of Arizona*

### Dynamic Dependencies and Performance Improvement

Marc Chiarini and Alva Couch, *Tufts University*

### Automatic Software Fault Diagnosis by Exploiting Application Signatures

Xiaoning Ding, *The Ohio State University*; Hai Huang, Yaoping Ruan, and Anees Shaikh, *IBM T.J. Watson Research Lab*; Xiaodong Zhang, *The Ohio State University*

## INVITED TALKS I

### Integrating Linux (and UNIX and Mac) Identity Management in Microsoft Active Directory

Mike Patnode, *Centrify*

If you have a mixed environment, some of these might be on your must-do list: centralizing authentication, access control and policy management in Microsoft AD, using the Group Policy features of Active Directory for Linux management, delivering SSO to your users, and complying with government regulations. How can you pull it all off? We’ll discuss the challenges, as well as explore the options both in the public domain and from commercial providers. The questions we’ll answer include: Why would I want to integrate Linux with Active Directory? What are the issues (e.g., compatibility and maintenance, integration, organizational impediments, cost)? What are the choices in terms of technology requirements and components?

## INVITED TALKS II

### Programming the Virtual Infrastructure

Paul Anderson, *University of Edinburgh*

With the use of virtualization, changes in a computing infrastructure no longer require physical intervention: the capacity of the virtual machines, their attached disks, and their network connections can all be changed by software. The challenges of configuring this infrastructure have some interesting analogies with the task of programming the first computers—and the whole new discipline of software engineering was needed to fully exploit their power. What does this mean for today’s system administrator?

## THE GURU IS IN

### Managing Large (to Massive) Storage Systems

Jacob Farmer, *Cambridge Computer Services*

Bring your most perplexing questions on this topic to our gurus. See [www.usenix.org/lisa08/tech](http://www.usenix.org/lisa08/tech) for more details.

2:00 P.M.–3:30 P.M.

## REFEREED PAPERS

## Large-ish Infrastructure

## Petascale System Management Experiences

Narayan Desai, Rick Bradshaw, Susan Coghlan, Andrew Cherry, Cory Lueninghoener, and William Scullin, *Argonne National Laboratory*

## Rapid Parallel Systems Deployment: Techniques for Overnight Clustering

Donna Cumberland, Randy Herban, Rick Irvine, Michael Shuey, and Mathieu Luisier, *Purdue University*

## ENAVis: Enterprise Network Activities Visualization

Qi Liao, Andrew Blach, Aaron Striegel, and Douglas Thain, *University of Notre Dame*

## INVITED TALKS I

## Deterministic System Administration

Andrew Hume, *AT&T Labs—Research*

The vision is clear and seductive: take a modest-sized specification of a computing environment and automatically derive all the stuff you actually need, from DHCP configurations to ordering cables. Is it possible to account for every box, every cable, every RAID box, every volume mounted, every OS deployed? I describe an attempt to do so, fighting the forces of Chaos and Nature, armed only with logical positivism, Ruby, little languages, and sarcasm.

## INVITED TALKS II

## How to Proceed When 1000 Call Agents Tell You, “My Computer Is Slow”: Creating a User Experience Monitoring System

Tobias Oetiker, *OETIKER+PARTNER AG*

Once users have figured out that their computers are slow, there is an uphill battle to improve the performance and at the same time lose that slowness image. In this talk I will report on the development of a Perl-based system for passive application monitoring for a large Swiss telecom company. The system keeps track of hundreds of different performance metrics. Running on over 1,000 client workstations, several gigabytes of performance data are gathered each week and stored in a central PostgreSQL database. An Ajax-enabled Web application allows users to explore, compare, and investigate performance data. Hear how investigating performance problems has turned from random guesswork into a clearly defined process, based on objective measurements rather than rumors.

## THE GURU IS IN

## Spam Fighting

Chris St. Pierre, *Nebraska Wesleyan University*

Bring your most perplexing questions on this topic to our gurus. See [www.usenix.org/lisa08/tech](http://www.usenix.org/lisa08/tech) for more details.

4:00 P.M.–5:30 P.M.

## REFEREED PAPERS

## Trust and Other Security Matters

## Fast, Cheap, and in Control: Towards Pain-Free Security!

Sandeep Bhatt, Cat Okita, and Prasad Rao, *Hewlett-Packard*

## Concord: A Secure Mobile Data Authorization Framework for Regulatory Compliance

Gautam Singaraju and Brent Hoon Kang, *University of North Carolina at Charlotte*

## Authentication on Untrusted Remote Hosts with Public-Key Sudo

Matthew Burnside, Mack Lu, and Angelos Keromytis, *Columbia University*

## INVITED TALKS I

## Does Your House Have Lions? Controlling for the Risk from Trusted Insiders

Marcel Simon, *Medco Health Solutions*

How do you control for risk from trusted insiders? The nature of the job that system/network/database administrators, application developers, operations center staff, etc., do pretty much requires them to have privileged access to your infrastructure. That very privilege means rogues among such individuals can both do great damage and cover their tracks, so how do you protect your information? This talk proposes a practical, technology-neutral approach to trusted insider controls that adapts readily to your business practices and has proven itself over years of production usage.

## INVITED TALKS II

## Spine: Automating Systems Configuration and Management

Rafi Khardalian, *Ticketmaster*

Spine is Ticketmaster's in-house configuration management system, which was recently released to the community via GPL. Spine contributes significantly to our ability to manage 4,000+ globally distributed systems with a relatively small team of sysadmins. We rely on OS-supplied provisioning tools to perform the initial bootstrap, after which Spine is deployed and used to apply system-specific configuration. We use Spine for the day-to-day management of our infrastructure, including the rollout of new applications and enforcing the consistency of a given configuration across an essentially infinite number of instances.

## THE GURU IS IN

## MySQL 4:00 p.m.–4:45 p.m.

Sheeri K. Cabral, *The Pythian Group*

## PostgreSQL 4:45 p.m.–5:30 p.m.

Josh Berkus, Josh Drake, and David Fetter, *PostgreSQL Project*

Bring your most perplexing questions on this topic to our gurus. See [www.usenix.org/lisa08/tech](http://www.usenix.org/lisa08/tech) for more details.

# TECHNICAL SESSIONS

9:00 A.M.–10:30 A.M.

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## PLENARY SESSION

### Reconceptualizing Security

Bruce Schneier, *Chief Security Technology Officer, BT*

Security is both a feeling and a reality. You can feel secure without actually being secure and you can be secure even though you don't feel secure. We tend to discount the feeling in favor of the reality, but they're both important. The divergence between the two explains why we have so much security theater, and why so many smart security solutions go unimplemented. Several different fields—behavioral economics, the psychology of decision-making, evolutionary biology—shed light on how we perceive security, risk, and cost. It's only when the feeling and the reality of security converge that we have real security.

Bruce Schneier is an internationally renowned security technologist and author. Described by *The Economist* as a “security guru,” he is best known as a refreshingly candid and lucid security critic and commentator. When people want to know how security really works, they turn to Schneier.

His first bestseller, *Applied Cryptography*, explained how the arcane science of secret codes actually works. It was described by *Wired* as “the book the National Security Agency wanted never to be published.” His book on computer and network security, *Secrets and Lies*, was called by *Fortune* “[a] jewel box of little surprises you can actually use.” His current book, *Beyond Fear*, tackles the problems of security from the small to the large: personal safety, crime, corporate security, national security.

Regularly quoted in the media, he has testified on security before the United States Congress on several occasions and has written articles and op eds for many major publications, including *The New York Times*, *The Guardian*, *Forbes*, *Wired*, *Nature*, *The Bulletin of the Atomic Scientists*, *The Sydney Morning Herald*, *The Boston Globe*, *The San Francisco Chronicle*, and *The Washington Post*.

Schneier also publishes a free monthly newsletter, *Crypto-Gram*, which has over 130,000 readers. In its seven years of regular publication, *Crypto-Gram* has become one of the most widely read forums for free-wheeling discussions, pointed critiques, and serious debate about security. As head curmudgeon at the table, Schneier explains, debunks, and draws lessons from security stories that make the news.

11:00 A.M.–12:30 P.M.

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## REFEREEED PAPERS

### Virtualization

#### Storm: Weathering Network and Electrical Surges Using Virtualization

Mark Dehus and Dirk Grunwald, *University of Colorado*

#### IZO: Applications of Large-Window Compression to Virtual Machine Management

Mark A. Smith, Jan Pieper, Daniel Gruhl, and Lucas Villa Real, *IBM Almaden Research Center*

#### Portable Desktop Applications Based on P2P Transportation and Virtualization

Youhui Zhang, Xiaoling Wang, and Hong Liang, *Tsinghua University*

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## INVITED TALKS I

### Mac OS X: From the Server Room to Your Pocket

Jordan Hubbard, *Director, UNIX Technology Group, CoreOS, Apple, Inc.*

This talk will cover the evolution of Mac OS X and its deployment on everything from large servers to embedded platforms. Hardware trends and some of the challenges they present for Apple and the industry as a whole, as well as some of the challenges facing UNIX, will be discussed.

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## INVITED TALKS II

### An Open Audit of an Open CA

Ian Grigg, *CAcert*

How does a lightweight community Certificate Authority (“CA”) engage in the heavyweight world of PKI and secure browsing? With the introduction of Public Key Infrastructure, the Internet security framework rapidly became too complex for individuals and small groups to deal with, and the audit stepped into the gulf to provide a kinder face, in the form of a simple opinion or judgment call. This talk tracks the systems audit of CAcert, an open-membership CA, as a case study in auditing versus the open Internet, community versus professionalism, quality versus enthusiasm. It will look at how CAcert found itself at this point and then will walk through some big-ticket items, such as risks, assurance, disputes, privacy, and security. Can CAcert deliver on its goal of free certs?

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## THE GURU IS IN

### VMware

Richard McDougall and John Y. Arrasjid, *VMware*

Bring your most perplexing questions on this topic to our gurus. See [www.usenix.org/lisa08/tech](http://www.usenix.org/lisa08/tech) for more details.

2:00 P.M.–3:30 P.M.

## REFEREED PAPERS

## On the Wire

**Correlated Distributed Events as Feedback for an Adaptive Firewall**Matthew Disney and David Vasil, *Oak Ridge National Laboratory***Topnet: A Network-aware top(1)**Antonis Theocharides, Demetres Antoniadis, Michalis Polychronakis, Elias Athanasopoulos, and Evangelos P. Markatos, *Institute of Computer Science, Foundation for Research and Technology (ICI-FORTH), Hellas, Greece***Fast Packet Classification for Snort**Alok Tongaonkar, Sreenaath Vasudevan, and R. Sekar, *Stony Brook University*

## INVITED TALKS I

**OpenSolaris and the Direction of Future Operating Systems**James Hughes, *Sun Microsystems*

This presentation will discuss the currently available OpenSolaris distribution, which is based on Solaris and provides a new installation, patch, and package system. It offers improved familiarity for developers coming from a Linux environment, with the goal of providing a capable platform for creating applications. Computing requirements are changing and future operating systems (not just OpenSolaris) will have to be capable of handling large memory, high hardware thread counts, and high-performance networking, while adding security, scalable storage management, and virtualization and making new classes of large-scale applications possible.

## INVITED TALKS II

**Auditing UNIX File Systems**Johnnie Konstantas, *Varonis*

Lack of visibility into UNIX file share data use and poor access control have been a reality since the inception of UNIX. Today, data governance initiatives are providing companies with the means to obtain a consistent, enterprise-wide view of their data, to improve data security, to create an audit trail, and to take significant steps toward compliance and risk reduction. This talk will focus on how technologies that actualize the tenets of data governance can simplify the process of auditing UNIX file systems and prevent the misuse of an organization's confidential data. We will also discuss the importance of managing access controls and how to integrate a comprehensive data governance framework into the UNIX environment.

## THE GURU IS IN

**Time Management**Tom Limoncelli, *Google NYC*

Bring your most perplexing questions on this topic to our gurus. See [www.usenix.org/lisa08/tech](http://www.usenix.org/lisa08/tech) for more details.

4:00 P.M.–5:30 P.M.

## REFEREED PAPERS

## Getting Stuff Done

**Sysman: A Virtual File System for Managing Clusters**Mohammad Banikazemi, David Daly, and Bulent Abali, *IBM T.J. Watson Research Center***Devolved Management of Distributed Infrastructures with Quattor**

Stephen Childs, *Trinity College Dublin, Ireland*; Marco Emilio Poleggi, *INFN-CNAF, Bologna, Italy*; Charles Loomis, *Laboratoire de l'Accélérateur Linéaire (LAL), Université Paris-Sud, Orsay, France*; Luis Fernando Muñoz Mejías, *Universidad Autónoma de Madrid (UAM), Spain*; Michel Jouvin, *Laboratoire de l'Accélérateur Linéaire (LAL), Université Paris-Sud, Orsay, France*; Ronald Starink, *National Institute for Subatomic Physics, Nikhef, Amsterdam, The Netherlands*; Stijn De Weirdt, *Interuniversity Institute for High Energy Physics (IIHE), Vrije Universiteit Brussel, Belgium*; Germán Cancio Meliá, *European Organization for Nuclear Research (CERN), Geneva, Switzerland*

**Authorisation and Delegation in a Configuration System Called Machination**Colin Higgs, *University of Edinburgh*

## INVITED TALKS I

**WTFM: Documentation and the System Administrator**Janice Gelb, *Sun Microsystems*

Most sysadmins hate documentation, both writing and reading it. This talk attempts to alleviate that frustration by explaining why system administration documentation is important, showing how to resolve common documentation problem areas using real-world examples, and describing how to improve product documentation from your company and from companies that make products that you use.

## INVITED TALKS II

**Fighting Spam with pf**Dan Langille, *Afilias USA, Inc.*

Dealing with spam consumes time, bandwidth, and disk space. This talk will introduce pf and show how it will reduce both the load on your mail server and the amount of spam received. This solution will work with any mail server and requires no changes to your existing mail server configuration.

## THE GURU IS IN

**Solaris Fault Management** 4:00 p.m.–4:45 p.m.Scott Davenport and Louis Tsien, *Sun Microsystems, Fault Management Development Team***ZFS** 4:45 p.m.–5:30 p.m.Richard Elling, *Sun Microsystems, ZFS*

Bring your most perplexing questions on this topic to our gurus. See [www.usenix.org/lisa08/tech](http://www.usenix.org/lisa08/tech) for more details.

# TECHNICAL SESSIONS

9:00 A.M.–10:30 A.M.

## PLENARY SESSION

### The State of Electronic Voting, 2008

David Wagner, *University of California, Berkeley*

As electronic voting has seen a surge in growth in the U.S. in recent years, controversy has swirled. Are these systems trustworthy? Can we rely upon them to count our votes? In this talk, I will discuss what is known and what isn't. I will survey some of the most important developments and analyses of voting systems, including the groundbreaking top-to-bottom review commissioned by California Secretary of State Debra Bowen last year. I will take stock of where we stand today, the outlook for the future, and the role that technologists can play in improving elections.

David Wagner is an Associate Professor in the Computer Science Division at the University of California at Berkeley, working in the areas of computer security and electronic voting. He and his Berkeley colleagues are known for discovering a wide variety of security vulnerabilities in various cell phone standards, 802.11 wireless networks, electronic voting systems, and other widely deployed systems. Last year, he helped lead a comprehensive review commissioned by California Secretary of State Debra Bowen to examine three California e-voting systems. David is a member of the Election Assistance Commission's Technical Guidance Development Committee, the Federal advisory board charged with helping to draft future voting standards.



11:00 A.M.–12:30 P.M.

## WORK-IN-PROGRESS REPORTS (WIPS)

A Work-in-Progress report (WiP) is a very short presentation about current work. It is a great way to poll the LISA audience for feedback and interest. We are particularly interested in presentations of student work. To schedule a short presentation, send email to [lisa08wips@usenix.org](mailto:lisa08wips@usenix.org) or sign up on the first day of the technical sessions.

## INVITED TALKS I

### How to Stop Hating MySQL: Fixing Common Mistakes and Myths

Sheeri K. Cabral, *The Pythian Group*

If you find yourself muttering “MySQL is awful,” you cannot miss this session. Many common-sense approaches backfire when applied to schemas and queries in MySQL. Sheeri K. Cabral of The Pythian Group will explain why that happens and how to think about designing, tuning, and optimizing MySQL, so you can save your hate for more important things, such as vi vs. emacs discussions. There will be plenty of time, so feel free to ask any questions, particularly about query and schema optimization (actual or in the abstract).

## INVITED TALKS II

### Designing, Building, and Populating a 10-Megawatt Datacenter

Doug Hughes, *D.E. Shaw Research, LLC*

10MW isn't anywhere close to the giant datacenters of Yahoo!, Google, Amazon, or Microsoft, but they usually have large teams of people at multiple locations and often none of them are sysadmins. This talk will give you the system administrator's perspective, since I was heavily involved in many phases of the design, evaluation, and build process. We'll talk about compute density, things that inhibit it, cooling, power and power distribution, machine planning, and supporting large and dynamic HPC clusters. How many kW can you fit in a rack? Just because you can, should you? What sorts of redundancy should you build in? How do you talk to site electricians? We've looked at these questions and more, arriving at some conclusions that could help you.

## THE GURU IS IN

AFS 11:00 a.m.–11:45 a.m.

Esther Filderman, *The OpenAFS Project*

Configuration Management 11:45 a.m.–12:30 p.m.

Luke Kanies, *Reductive Labs*

Bring your most perplexing questions on this topic to our gurus. See [www.usenix.org/lisa08/tech](http://www.usenix.org/lisa08/tech) for more details.

**1:00 P.M.–1:45 P.M.****Lunchtime Talk****“Standard Deviations” and the “Average” System Administrator**Alva L. Couch, *Associate Professor of Computer Science, Tufts University*

The nice thing about standards is that there are so many of them from which to choose. Sysadmins often function according to “personal standards” that are in fact not standards at all. By comparison, electricians adhere to strict quality standards that are externally verifiable. Compliance with standards goes beyond certifying the administrator to certifying each site for compliance. Should there be standards for system administration? What current standards exist? What might future standards be? What would be the costs and would they be worth the trouble? I will discuss potential answers to these questions and solicit alternative views from the audience. I will explain why I believe that if we are to be respected as a guild of craftspeople, we must learn—like electricians—to utilize standards strategically and effectively to uplift the profession and encourage respect for its practitioners.

**2:00 P.M.–3:30 P.M.****INVITED TALKS I****Beyond VDI: Why Thin Client Computing and Virtual Desktop Infrastructures Aren’t Cutting It**Monica Lam, *MokaFive and Stanford University*

The advent of thin client computing and Virtual Desktop Infrastructure (VDI) revitalized computing by enabling applications, remote desktops, and even virtual machines to be run on centralized servers in a datacenter. However, wracked by performance, cost, and delivery issues, neither approach is cut out to solve the problem of managing multiple desktops within an organization. Come hear about the rise of a streamed virtual desktop approach that allows IT departments to manage and deploy secure desktops that run across multiple hardware and operating systems while working online or offline.

**INVITED TALKS II****Inside DreamWorks Animation Studios: A Look at Past, Present, and Future Challenges**Sean Kamath and Mike Cutler, *PDI/DreamWorks*

This talk will share some insights into the DreamWorks Animation Studios. We’ll explore the challenges of balancing custom workflow expectations, HPC compute requirements, the “10 billion files” dilemma, and bending the rules of physics and latency, all without losing our artistic roots. We’ll explain how we’ve made technology invisible in a workplace filled with scientists whose right brains are bigger than their left, and what it’s like to run 2,000+ Linux desktops being used full-time. We will engage in a debate on the merits of globalized computing, very high density computing, and storage clusters, suggesting new ideas about how to overcome these barriers.

**2:00 P.M.–3:30 P.M. (CONTINUED)****INVITED TALKS III****System Administration and the Economics of Plenty**Tom Limoncelli, *Google NYC*

Over the years IT resources (disk space, CPU, bandwidth) have gone from being scarce to being nearly infinitely plentiful. Why do our IT policies still reflect the days of scarcity? Seeing the world in terms of “the economics of plenty” brings about a paradigm shift that changes the way we treat our users, manage our systems, and take care of ourselves. Tom will discuss how this change in thinking can improve IT policies and practices and will present his thoughts on why the open source movement depends on this paradigm shift.

**THE GURU IS IN****MacOS X**Jordan Hubbard, *Director, UNIX Technology Group, Apple, Inc.*

Bring your most perplexing questions on this topic to our gurus. See [www.usenix.org/lisa08/tech](http://www.usenix.org/lisa08/tech) for more details.

**4:00 P.M.–5:30 P.M.****Closing Session****LISA Quiz Show**Jeremy Allison, *Google*

The LISA Quiz Show is back! Closing this year’s conference, the LISA Quiz Show will pit teams of attendees against each other in a test of technical knowledge and cultural trivia. This year Jeremy Allison will bring his acclaimed game show hosting skills to the table, assuring a LISA Quiz Show unlike any other. Don’t miss it!



## JOIN YOUR PEERS FOR THREE DAYS OF FOCUSED DISCUSSION

Senior system administrators will want to participate in one or more of these full- and half-day workshops. Attendance is limited for each workshop, which ensures a seminar-like atmosphere. To attend a workshop, you must be an accepted participant of that workshop.

**Sunday, November 9, 9:00 a.m.–5:00 p.m.**

### **Fighting Spam: The State of the Art**

Chris St. Pierre, *Nebraska Wesleyan University*

Keeping up with the new techniques, counter-techniques, tools, intelligence, and approaches to fighting spam can itself be a full-time job. The goal of this workshop is for every participant to come away with an updated arsenal for fighting spam, whether it's a tool that makes their existing setup quicker or easier, a concept they can develop into another arrow in their quiver, or an entirely new layer to fight the latest spamming techniques. The ideal attendee for this workshop should have a mostly functional email and spam setup that they're looking to polish and tweak. Since this workshop is predicated on the idea of sharing tools and approaches, the attendees should have some of each up their sleeves (or, better yet, in production) that they can bring. Contact [lisa08ws-spam@usenix.org](mailto:lisa08ws-spam@usenix.org) to participate.

**Sunday, November 9, 9:00 a.m.–5:00 p.m.**

### **MicroLISA**

Robert Au

Sysadmins at small sites, those with at most a few IT staff, face some unique technical and organizational challenges: teams generally assign broader responsibilities to each member; users and management have more exposure to front-line workers, and vice versa; and the organizational environment often limits budget and manpower stringently. Some techniques that are standard at larger sites may be worthwhile in smaller sites, if their value outweighs the often higher learning, implementation, and maintenance costs. Other problems, such as backup, restore, and disaster recovery, require significantly different solutions at small sites. Last year's MicroLISA drew participants from diverse environments and the discussion ranged over many of the topics above. We will revisit some of those topics with another year of experience and innovations. In addition, we will tackle some of our ongoing problems. To participate, contact [lisa08ws-microlisa@usenix.org](mailto:lisa08ws-microlisa@usenix.org).

**Sunday, November 9, 9:00 a.m.–12:30 p.m.**

### **Business-Driven IT Management**

Mark Burgess, *Oslo University College*;  
Claudio Bartolini, *HP Labs*

How do we align IT systems with the needs of a business or other organization? In this half-day workshop we shall present a few of the ideas that have emerged from the successful BDIM conferences and open for discussion by practitioners interested in sharing and contributing to the understanding of this interesting problem. Sign up for a frank exchange of ideas or come and present your particular dilemma or solution. Contact [lisa08ws-bdim@usenix.org](mailto:lisa08ws-bdim@usenix.org) to attend.

**Sunday, November 9, 1:30 p.m.–5:00 p.m.**

### **Practical Configuration Management**

Luke Kanies, *Reductive Labs*

The goal of the workshop is to understand the state of configuration management tools and practice. Attendees should be high-level sysadmins currently using configuration management and looking for the next advance and to share failures and successes. The workshop will be largely self-organized, based on attendees' suggested topics and goals, but will focus entirely on practical solutions. Contact [lisa08ws-cm@usenix.org](mailto:lisa08ws-cm@usenix.org) to participate.

Monday, November 10, 9:00 a.m.–5:00 p.m.

### University Issues

John “Rowan” Littell, *California College of the Arts*; Adele Shakal, *University of Southern California*

The focus of this workshop is on issues peculiar to university and college computing shops. Schools vary greatly in their approach to running computing infrastructures. The differences can stem from the general culture of the school as well as upper management, or even from departmental versus institution-wide services. To attend the workshop, please send email to [lisa08ws-univissues@usenix.org](mailto:lisa08ws-univissues@usenix.org) with a short paragraph describing your institution, the biggest issue you face today, or something about your institution that works particularly well or that others might want to consider for their own school. You can also include topics you would like to see on the workshop agenda.

Monday, November 10, 9:00 a.m.–5:00 p.m.

### ZFS

Richard Elling, *Sun Microsystems*

The objective of this workshop is to help intermediate or advanced system administrators who manage file systems, implement data protection schemes, and provide backup/restore services to become proficient at managing the ZFS file system. Potential topics include planning for use of disk storage, data protection, redundancy, failure modes, fault detection, repair, performance, backup/restore, hierarchical data storage, integration with other storage services, clustering, tips, tricks, and gotchas. To participate, contact [lisa08ws-zfs@usenix.org](mailto:lisa08ws-zfs@usenix.org).

Monday, November 10, 9:00 a.m.–5:00 p.m.

### Government and Military System Administration

Andrew Seely, *Science Applications International Corporation*

Are you the sysadmin responsible for computing systems owned by government or military agencies? the sysadmin who works in secure environments, deals with classified data, provides GOTS support, and deploys to the latest military hotspots? If so, then this workshop is for you. Participants will share insights into the broad range of government system administration requirements and will benefit from making contacts in related fields. Discussion topics will include effectiveness of contract, uniformed sysadmins, DoD regulation 8570.01-M, challenges of working across multiple security domains, deployed sysadmin, and more. Contact [lisa08ws-gov@usenix.org](mailto:lisa08ws-gov@usenix.org) to participate.

Tuesday, November 11, 9:00 a.m.–5:00 p.m.

### Advanced Topics

Adam Moskowitz, *PermaBit Technology Corp.*

This workshop, intended for very senior administrators, provides an informal roundtable discussion of the problems facing system administrators today. Attendance is limited and based on acceptance of a position paper (plain ASCII, three paragraphs maximum); a typical paper covers what the author thinks is the most difficult or important issue facing system administrators today, why this is a problem, and why this problem is important. More information about the workshop and about position papers can be found at <http://menlo.com/atw/2008/overview.html>; position papers should be sent to [lisa08ws-atw@usenix.org](mailto:lisa08ws-atw@usenix.org). Attendees are required to bring a laptop computer.

Tuesday, November 11, 9:00 a.m.–5:00 p.m.

### Best Practices in the Server Room

Hunter Matthews, *Duke University*

This workshop, intended for mid-level and advanced sysadmins, is intended to share best practices between sites and to try to predict changes that will affect those best practices. A definite topic this year will be some discussion of “green” trends: newer cooling techniques and power efficiencies. Attendance is limited to people with at least some experience in this area and who need to specify and build datacenters as part of their jobs. To attend, send email to [lisa08ws-serverrm@usenix.org](mailto:lisa08ws-serverrm@usenix.org) with a brief description of your areas of interest/experience and indicate whether you would be prepared to make a short presentation.

Tuesday, November 11, 9:00 a.m.–5:00 p.m.

### Virtual Infrastructures

Paul Anderson, *University of Edinburgh*; Phil Huber, *XCalibre Communications*

This workshop will provide a forum to exchange the latest ideas about and experiences with virtualization. There will be a mixture of short presentations and informal discussions; active participation will be expected and applications are welcome from anyone with practical experience or research interests in the area. Please send an email request to [lisa08ws-virtu@usenix.org](mailto:lisa08ws-virtu@usenix.org) for an invitation. You should include a paragraph describing your interest/experience in the area and a short list of topics/issues you would like to see discussed. Please also indicate if you would be interested in giving a short presentation on a particular topic. See <http://homepages.inf.ed.ac.uk/group/lssconf/iWeb/lssconf/2008.html> for updates and further details.

# LIVE VIDEO STREAMING

## LIVE VIDEO STREAMING OF INVITED TALKS AVAILABLE

USENIX has partnered with *Linux Pro Magazine* to offer live video streaming of the invited talks tracks.



The live streaming offers a visual of the speaker, the slides, and an interactive chatting capability. After the live transmission of the conference, you can review all of the talks once more individually in the archive—whenever you like and as often as you like. Don't miss out on this excellent opportunity.

Find out more at <http://www.linuxpromagazine.com/lisa08>.

Looking for a sample? Check out the archives of the 2008 USENIX Annual Technical Conference at <http://www.linuxpromagazine.com/usenix08>.



*A Turning Point in IT*

## Symposium on Computer Human Interaction for Management of Information Technology

November 14/15, 2008 San Diego, CA



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### **General Chairs:**

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Started in 2007, ACM CHIMIT Symposium is the leading forum for discussing topics on IT management with a focus on people, business, and technology.

**2008 Program Highlights:** Plenary lectures by **David Blank-Edelman** and **Bill Rouse**, a panel on emerging developments in system administration user interface design, papers describing recent research

At CHIMIT, researchers and practitioners share issues, solutions, and research drawing upon fields such as human-computer interaction, human factors, computer systems, and management and service sciences to address cognitive, social, and technical issues in managing the complexity of modern systems.

**[www.chimit08.org](http://www.chimit08.org)**

# VENDOR EXHIBITION



## SEE WHAT'S NEW AT THE LISA '08 VENDOR EXHIBITION

Wednesday, November 12,  
Noon–7:00 p.m.

Thursday, November 13,  
10:00 a.m.–2:00 p.m.

### DON'T MISS THIS UNIQUE OPPORTUNITY

Make knowledgeable decisions on products and services for your business needs. Exhibitor demonstrations save you hours of research and let you quickly compare solutions.

Learn about the latest and greatest technologies and tools from industry leaders, provocative startups, and open source projects.

See demonstrations of innovative products and services that can optimize your systems, network, and Internet management—and simplify your life.

Get in-depth answers from well-informed company representatives. (LISA exhibitors know to send technical people to this event!)

Buy books at discounted prices and get them signed by the authors.

### EVERYONE IS WELCOME!

The exhibition is open to the public.

Register for a free pass at [www.usenix.org/lisa08/exhibition](http://www.usenix.org/lisa08/exhibition).

**"I got lots of great information and  
learned about some great solutions."  
—a LISA attendee**

### Exhibitors as of August 4, 2008

#### PREMIUM EXHIBITORS

American Registry for Internet Numbers (ARIN)

Google

GroundWork Open Source

ISC (Internet Systems Consortium)

Permabit

Silicon Mechanics

Sun Microsystems

Trusted Computer Solutions

Zenoss, Inc.

#### EXHIBITORS

AdRem Software

Advanced Computer & Network Corporation

Berkeley Communications

e-DMZ Security

FreeBSD

*Linux Pro Magazine*

MRV Communications

No Starch Press

Oracle

PostgreSQL

SNIA

Splunk

*The Register*

Zasmos

### EXHIBIT HALL HAPPY HOUR

Join us at the Vendor Exhibition from 5:30 p.m. to 6:30 p.m. on Wednesday for snacks and drinks, and take the opportunity to learn about the latest products and technologies.

### SYSADMIN OF THE YEAR

Don't miss Splunk's Sysadmin of the Year award presentation at the Exhibit Hall Happy Hour!

Are you an IT superhero? Enter Splunk's Sysadmin of the Year Contest at <http://www.sysadminoftheyear.com>.

### LISA '08 SPONSORSHIP & EXHIBITING OPPORTUNITIES

- Get system administrators talking about your products and services.
- Sell your solutions to a qualified audience.
- Conduct market research and enlist beta testers.
- Recruit among highly experienced, highly educated system administrators.
- Enhance your visibility among recognized leaders of the system, network, and security administration communities.

See [www.usenix.org/lisa08/sponsors](http://www.usenix.org/lisa08/sponsors) for details or contact Camille Mulligan, Exhibits Manager, (510) 528-8649 ext. 17 or [exhibits@usenix.org](mailto:exhibits@usenix.org).

# ABOUT USENIX & SAGE

## USENIX: THE ADVANCED COMPUTING SYSTEMS ASSOCIATION

Since 1975, USENIX has brought together the community of system administrators, innovators, engineers, scientists, and technicians working on the cutting edge of computing. Our mission is to support research and technical training for this dynamic community and our over 5,000 active members. USENIX created the LISA conference over 20 years ago, and it has become the forum for real-world, in-depth system administration training. A USENIX membership offers you all you need to stay ahead of the game in the ever-changing world of IT, including plenty of sysadmin content and a sysadmin-dedicated issue of *;login;*, the bi-monthly USENIX magazine; the sysadmin-focused training and practical information found at LISA, at the USENIX Annual Technical Conference, and at the USENIX Security Symposium; and the USENIX Jobs Board.

A complimentary membership in USENIX is part of every non-USENIX-member registration. The benefits of this membership include:

- Free subscription to *;login;*, the highly regarded bi-monthly magazine of USENIX, both in print and online
- Discounts on technical registration fees for all USENIX-sponsored and co-sponsored events, including LISA
- Discounts on purchasing printed Proceedings, CD-ROMs, and other Association publications
- Discounts on industry-related publications such as *Linux Journal*, *ACM Queue*, and O'Reilly and No Starch Press books
- The right to vote in USENIX Association elections

## SAGE: A USENIX SPECIAL INTEREST GROUP FOR SYSADMINS

SAGE is the USENIX SIG for sysadmins. Created by and for sysadmins, SAGE focuses on evolving best practices and technology. We're proud to offer our members access to information on the latest tools, trends, and training in the field.

A complimentary membership in SAGE is part of every non-SAGE-member registration. The benefits of membership include:

- Discount on registration for LISA, the annual Large Installation System Administration Conference
- A free Short Topics in System Administration booklet every year, discounts on all Short Topics booklets, and access to the Short Topics online library—17 volumes and growing!
- The option to join sage-members, an electronic mailing list for peer discussion and advice
- Immediate access to the results of the SAGE Salary Survey
- Access to the SAGE Jobs Board, including real-time email notification of new jobs posted and the ability to post resumes
- Discounts on industry-related publications

## THANKS TO USENIX & SAGE CORPORATE SUPPORTERS AND LISA '08 SPONSORS

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<i>Homeland Defense Journal</i>	<i>Network World</i>
<i>IEEE Security &amp; Privacy</i>	No Starch Press
<i>InfoSec News</i>	SNIA
ITtoolbox	StorageNetworking.org
<i>Linux+DVD Magazine</i>	SourceForge
<i>Linux Gazette</i>	<i>Systems Management News</i>
	<i>The Register</i>
	UserFriendly.org

## LIVE STREAMING POWERED BY *LINUX PRO MAGAZINE*

# ACTIVITIES/SERVICES/INFO FOR STUDENTS

To enhance your LISA conference experience, attendee events are held throughout the week. Attend the very popular Birds-of-a-Feather sessions (BoFs). Mingle with your peers and with technological luminaries during the receptions. See [www.usenix.org/lisa2008](http://www.usenix.org/lisa2008) for the latest additions to the activities schedule.

## EXHIBIT HALL HAPPY HOUR

**Wednesday, November 12, 5:30 p.m.–6:30 p.m.**

Join us at the Vendor Exhibition for refreshments, and take the opportunity to learn about the latest products and technologies. Splunk will also be announcing the winner of their Sysadmin of the Year contest. Don't miss it!

## POSTER SESSIONS

**Wednesday, November 12, 6:30 p.m.–7:30 p.m.**

**Thursday, November 13, 5:30 p.m.–6:30 p.m.**

The poster sessions are opportunities to display a poster describing recent work. Authors will be present at the times indicated above to discuss their work with anyone who is interested.

## CONFERENCE RECEPTION

**Thursday, November 13, 6:30 p.m.–8:30 p.m.**

Join us at the Conference Reception for beer, wine, dinner, and an added opportunity to network with your colleagues, get your questions answered, and chat about the conference.

## BIRDS-OF-A-FEATHER SESSIONS (BOFS)

**Monday, November 10, 7:00 p.m.–11:00 p.m.**

**Tuesday, November 11, 7:00 p.m.–11:00 p.m.**

**Wednesday, November 12, 7:00 p.m.–11:00 p.m.**

**Thursday, November 13, 8:30 p.m.–11:30 p.m.**

Lead or attend a BoF! Meet with your peers! Present new work! Don't miss these special activities designed to maximize the value of your time at the conference. The always popular evening Birds-of-a-Feather sessions are very informal gatherings of persons interested in a particular topic. BoFs may be scheduled during the conference at the registration desk or in advance by sending email to [bofs@usenix.org](mailto:bofs@usenix.org).

Want to demonstrate a new product or discuss your company's latest technologies with LISA attendees? Host a Vendor BoF! Email [sponsorship@usenix.org](mailto:sponsorship@usenix.org) for more information.

## WORK-IN-PROGRESS REPORTS (WIPS)

**Friday, November 14, 11:00 a.m.–12:30 p.m.**

Short, pithy, and fun, Work-in-Progress reports introduce interesting new or ongoing work. If you have work you would like to share or a cool idea that's not quite ready for publication, send a one- or two-paragraph summary to [lisa08wips@usenix.org](mailto:lisa08wips@usenix.org). We are particularly interested in presenting students' work. A schedule of presentations will be posted at the conference, and the speakers will be notified in advance. Work-in-Progress reports are five-minute presentations; the time limit will be strictly enforced.

## SPECIAL CONFERENCE SERVICES

### BRING YOUR LAPTOP!

USENIX is pleased to offer Internet connectivity at LISA '08 via an 802.11a/b/g WiFi network. Those not wishing to use wireless can plug in and charge up in the Laptop Lounge. No laptop? No problem. The self-registration terminals are available for general use when not being used for registration. Laser printers will be available in the Laptop Lounge and at the self-registration terminals. Questions? Send email to [tony@usenix.org](mailto:tony@usenix.org).

The wired and wireless networks provided by USENIX at this conference are for the use of conference attendees only, subject to the following conditions:

- USENIX may monitor these networks.
- Any illicit or intrusive use of the network, including packet sniffing, is expressly forbidden.
- The wireless network is open and insecure. USENIX strongly recommends that all users encrypt their transmissions. Users are solely responsible for the security of their passwords and data.

If you have any questions or concerns about the use of these networks, please contact any USENIX staff or Board member immediately.

### CONFERENCE PROCEEDINGS

Those registered for the technical sessions will receive a complimentary copy of the Proceedings, either in print or on CD-ROM. Additional copies will be available for purchase at the conference.

## STUDENT DISCOUNTS & GRANTS

### TRAINING

A limited number of tutorial seats are reserved for full-time students at the very special rate of \$200 for one full-day tutorial (if you plan to take half-day tutorials, you must take both half-days to qualify for the student rate). You must send email to [lisa08\\_reg@usenix.org](mailto:lisa08_reg@usenix.org) to confirm availability and make a reservation. In your email, please specify which tutorials you wish to attend. You will be given a code number to use when you register. The Conference Department must receive your registration form, with the code number, full payment, and a copy of your current student I.D. card, within 14 days of the date you make your reservation, or your reservation will be canceled. This special fee is nontransferable.

### TECHNICAL SESSIONS

Full-time students may attend technical sessions for only \$110 per day. You must fax a copy of your current student I.D. card to the USENIX Conference Dept. when you register. This special fee is not transferable.

### STUDENT GRANTS FOR CONFERENCE ATTENDANCE

A limited number of student grants are available to pay for travel, accommodations, and registration fees to enable full-time students to attend the conference. To apply for a grant, see [www.usenix.org/students/grant.html](http://www.usenix.org/students/grant.html). Sorry, faxes will not be accepted for student grant applications.

# HOTEL & TRAVEL INFORMATION



## HOTEL

### Town & Country Resort and Convention Center

500 Hotel Circle North

San Diego, CA 92108

Telephone (toll free): 800.77.ATLAS

Telephone (local): 619.291.7131

Fax: 619.291.3584

### Hotel Reservation Discount Deadline: Friday, October 17, 2008

USENIX has negotiated special rates for conference attendees at the Town & Country Resort and Convention Center. Please make your reservation as soon as possible by contacting the hotel directly. You must mention USENIX or LISA to get the special group rate. You may also book online at <http://www.usenix.org/events/lisa08/towncountry.html>.

### Special Attendee Room Rates

Garden Rooms: \$131 single, \$146 double

Regency Tower/Courtyard Rooms: \$143 single, \$158 double

Royal Palm Tower Rooms: \$154 single, \$169 double

Rates do not include 10.5% Occupancy Tax or 2% San Diego Tourism Marketing District Assessment.

### Why should you stay in the headquarters hotel?

We encourage you to stay in the conference hotel and when making your reservation to identify yourself as a USENIX conference attendee.

It is by contracting rooms for our attendees that we can significantly reduce hotel charges for meeting room rental. When the sleeping rooms are not utilized, we face significant financial penalties. As a result, these penalties ultimately force us to raise registration fees.

We recognize, however, that not everyone can afford to stay in the conference hotel, so we always try to book venues that have some low-cost alternatives available near the conference.

With costs going higher and higher, we are working very hard to negotiate the very best hotel rates and keep other conference expenses down in order to keep registration fees as low as possible. We appreciate your help in this endeavor.

### Questions? Contact the USENIX Conference Department.

Phone: (510) 528-8649

Email: [lisa08\\_reg@usenix.org](mailto:lisa08_reg@usenix.org)

## TRANSPORTATION

Hotel parking is \$4/day. The hotel is approximately 10 minutes from the San Diego International Airport, Lindbergh Field. Airport transportation options include taxi (approximately \$25–30 one way), XPRESS Shuttle (\$11 per person one way), and SUPER SHUTTLE (\$12 per person one way). For more information about XPRESS Shuttle, see [http://www.xpressshuttle.com/san\\_diego.htm](http://www.xpressshuttle.com/san_diego.htm). More information about SUPER SHUTTLE can be found at <http://supershuttle.com>.

The San Diego Trolley's Green Line is adjacent to the Town & Country at the Fashion Valley Transit Center. The Trolley is a fun way to get around, whether traveling to the International Border or heading to Centre City's shopping, restaurants, harbor, and historic attractions.

The Trolley does not stop at the airport, but you can use bus service to connect with the Trolley. See <http://transit.511sd.com> to plan your trip. The Trolley system has two stations that connect with Amtrak.

### Traveling to LISA '08 from Outside the U.S.A.?

See detailed advice from the National Academies about visiting the United States at [http://www7.nationalacademies.org/visas/Traveling\\_to\\_US.html](http://www7.nationalacademies.org/visas/Traveling_to_US.html).

### About San Diego

USENIX and SAGE are pleased to bring LISA back to San Diego and the Town & Country Resort and Convention Center. San Diego offers beautiful weather, a wide array of restaurants to suit every taste and budget, and miles of stunning beaches. There are many attractions that will be of interest to LISA attendees. Here are just a few:

- The world-famous San Diego Zoo and Wild Animal Park, featuring thousands of species of rare and endangered animals
- SeaWorld San Diego, a 150-acre park featuring marine habitats, aquariums, and Shamu the killer whale
- The Reuben H. Fleet Science Center, featuring planetarium shows and more than 100 interactive science exhibits
- The Birch Aquarium at Scripps, where you can explore coral reefs, see sharks feed, and dip into tidepools
- LEGOLAND California, an interactive theme park for LEGO enthusiasts of all ages

More information is available from the San Diego Convention and Visitors Bureau, <http://www.sandiego.org>, as well as the Town & Country, <http://www.towncountry.com>.

# REGISTRATION INFORMATION & FEES

Register or make a reservation on the Web today at <http://www.usenix.org/lisa08/registration>.

Pay today with a credit card, or make a reservation online and then pay by check, phone, or fax. Have the best of both worlds: the convenience of online registration without the hassle of hand-written forms, and the ability to pay as you want, when you want!

**Early Bird Registration Deadline: Friday, October 17, 2008**

## TRAINING PROGRAM REGISTRATION INCLUDES:

- Admission to the tutorials you select
- Lunch on the day of your tutorials
- Training materials (on CD-ROM or in print)
- Admission to the Vendor Exhibition
- Admission to the Conference Reception
- Admission to the evening activities on the days for which you're registered
- Conference t-shirt
- Wireless connectivity in conference session area

## TECHNICAL SESSIONS REGISTRATION INCLUDES:

- Admission to all technical sessions on the days of your choice
- Copy of the Conference Proceedings (on CD-ROM or in print)
- Admission to the Vendor Exhibition
- Admission to the Conference Reception
- Admission to the evening activities on the days for which you're registered
- Conference t-shirt
- Wireless connectivity in conference session area

## WORKSHOP REGISTRATION INCLUDES:

- Lunch and refreshment breaks on the day of your workshop

## Multiple Employee Discount

We offer discounts for organizations sending 5 or more employees to LISA '08. Please contact the Conference Department at [lisa08\\_reg@usenix.org](mailto:lisa08_reg@usenix.org) for more details.

## Refund/Cancellation Date: Monday, November 3, 2008

All refund requests must be emailed to [lisa08\\_reg@usenix.org](mailto:lisa08_reg@usenix.org) by November 3, 2008. You may substitute another in your place.

**Please Read:** This is *not* a registration form. Please use our online form to register or make a reservation. If you choose to make a reservation and pay later by check or credit card, you will receive a printable summary of your session selections, the cost breakdown, and the total amount due. If you are paying by check or phone, submit a copy of the summary along with your payment or have it with you when you call. Tutorial bookings cannot be confirmed until payment has been received. Purchase orders, vouchers, and telephone reservations cannot be accepted.

## REGISTRATION FEES

USENIX is pleased to offer Early Bird Registration Discounts of up to \$300 to those who register for LISA '08 by October 17, 2008. After October 17, registration fees increase.

Daily Rates	Before Oct. 17	After Oct. 17
1 day of technical sessions	\$280	\$330
1 day of training	\$635	\$685
1 half-day of training; second half-day only \$300	\$335	\$385

SAVE! Choose One of Our Special Discount Packages	Before Oct. 17	After Oct. 17
A. 3 Days of Tech Sessions <i>Save \$100!</i>	\$730	\$880
B. 2 Days of Training <i>Save \$50!</i>	\$1220	\$1320
C. 3 Days of Training <i>Save \$100!</i>	\$1805	\$1955
D. 4 Days of Training <i>Save \$200!</i>	\$2340	\$2540
E. 5 Days of Training <i>Save \$300!</i>	\$2875	\$3125
F. 6 Days of Training <i>Save \$600!</i>	\$3210	\$3510
G. Wednesday/Thursday Half-and-Half Tech and Training*	\$915	\$1015
H. Virtualization or Solaris Training Series	\$3110	\$3410

*For maximum savings, combine Package A with Package B or C.*

\*Attend any combination of two half-days of training and two half-days of technical sessions on Wednesday and Thursday.

## Workshop Fees

1 half-day of workshops	\$75
1 full day of workshops	\$150

## Optional Costs

Continuing Education Units (CEUs): \$15 per training day

## Registration Fees for Full-Time Students

USENIX offers full-time students special low registration fees for LISA '08 that are available at any time. See p. 31 for details.

Daily Rates	
1 day of technical sessions	\$110
1 day of training	\$200

## Nonmember Registration Fees

If you are a member of USENIX but *not* of SAGE, \$45 will be added.

If you are a member of SAGE but *not* of USENIX, \$120 will be added.

If you are *not* a member of USENIX, SAGE, EurOpen.SE, or NUUG, \$165 will be added.

Students who are *not* members of USENIX: \$45 will be added.

Students who are *not* members of SAGE: \$30 will be added.

# LISA'08

LISA '08 is the meeting place of choice for system, network, database, and other computing administrators. Take advantage of 6 days of top-notch training and take home the tools you need.



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# USENIX

USENIX ASSOCIATION

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510.548.5738 fax

Register with the priority  
code on your mailing label  
to receive a \$25 discount!

Register by October 17 and SAVE!  
[www.usenix.org/lisa2008](http://www.usenix.org/lisa2008)

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