

Sponsored by

USENIX & [sage]
THE USENIX SIG FOR
SYSADMINS

6 DAYS OF TRAINING
BY INDUSTRY EXPERTS, INCLUDING:

- Gerald Carter on Ethereal and the Art of Debugging Networks
- Richard Bejtlich on TCP/IP Weapons
- Aileen Frisch on Administering Linux in Production Environments
- Chip Salzenberg on Higher-Order Perl
- And 55 other tutorials

LISA '06 offers the most
in-depth, real-world
system administration
training available!

LISA'06

A Blueprint for Real World System Administration

20TH LARGE INSTALLATION
SYSTEM ADMINISTRATION CONFERENCE

DECEMBER 3-8, 2006 | WASHINGTON, D.C.

Keynote: Cory Doctorow, science fiction writer, co-editor of Boing Boing, and former Director of European Affairs for the EFF, on Hollywood's Secret War on Your NOC

Invited Talks by industry leaders discuss important and timely topics, including:

- Simple Nomad, Vernier Networks, Inc., "Corporate Security: A Hacker Perspective"
- DJ Byrne, Jet Propulsion Laboratory, "Open Source Software and its role in Space Exploration"
- Mazda Marvasti, Integrien, "Everything You Know About Monitoring Is Wrong"

Refereed Papers, Hit the Ground Running Track, Guru Is In Sessions, Vendor Exhibition, Workshops, BoFs, WiPs, and more!

Register by November 10 and save! www.usenix.org/lisa2006

CONFERENCE AT A GLANCE

Saturday, December 2

- 5:00 p.m.–8:00 p.m. On-Site Registration
6:00 p.m.–7:00 p.m. Welcome Get-Together
7:00 p.m.–8:00 p.m. Conference Orientation

Sunday, December 3

- 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. Workshops
12:30 p.m.–1:30 p.m. Luncheon for Training & Workshop Attendees

Monday, December 4

- 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. Workshops
12:30 p.m.–1:30 p.m. Luncheon for Training & Workshop Attendees
7:00 p.m.–11:00 p.m. Birds-of-a-Feather Sessions

Tuesday, December 5

- 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. Workshops
12:30 p.m.–1:30 p.m. Luncheon for Training & Workshop Attendees
7:00 p.m.–11:00 p.m. Birds-of-a-Feather Sessions

Wednesday, December 6

- 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 Program
Noon–7:00 p.m. Vendor Exhibition
12:30 p.m.–1:30 p.m. Luncheon for Training Attendees
5:30 p.m.–6:30 p.m. Exhibition Reception
7:00 p.m.–11:00 p.m. Birds-of-a-Feather Sessions

Thursday, December 7

- 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 Program
10:00 a.m.–2:00 p.m. Vendor Exhibition
12:30 p.m.–1:30 p.m. Luncheon for Training Attendees
6:00 p.m.–8:00 p.m. Conference Reception
8:00 p.m.–11:00 p.m. Birds-of-a-Feather Sessions

Friday, December 8

- 8:00 a.m.–noon On-Site Registration
9:00 a.m.–5:00 p.m. Training Program
9:00 a.m.–5:30 p.m. Technical Program
12:30 p.m.–1:30 p.m. Luncheon for Training Attendees
2:00 p.m.–3:30 p.m. Work-in-Progress Reports
4:00 p.m.–5:30 p.m. Closing Session: Improv for Sysadmins

LISA'06

Building a Sysadmin Community



WHY ATTEND LISA '06?

“There is always one thing that I learn that makes me want to shout, ‘That just paid for the entire conference!’ Also, there have been many times when I learned about a new sysadmin tool at LISA years before it was popular: that’s really helped me stay ahead of the pack.”

—Tom Limoncelli, *Google*

Register today at www.usenix.org/lisa2006

Register by
November 10, 2006,
and
Save!

Hotel Discount Deadline:
November 10, 2006

Early
Bird
Discount
www.usenix.org/lisa2006

CONTENTS

- 1 Invitation from the Program Chair
- 1 Conference Organizers
- 2–3 Training at a Glance
- 4–12 Training Program
- 6 A Note for Managers
- 8 Continuing Education Units (CEUs)
- 13–17 Training Instructors
- 18 Keynote Address
- 18–23 Technical Sessions
- 24 Workshops
- 25 Vendor Exhibition
- 26 About USENIX & SAGE
- 26 Supporting Members & Sponsors
- 27 Conference Activities & Services
- 27 Student Discounts & Grants
- 28 Hotel & Travel Information
- 29 Registration Information & Fees

Dear Colleague,

On behalf of all of the LISA '06 organizers, I'd like to invite you to join us in Washington, D.C., for the 20th Large Installation System Administration Conference.

For the past 19 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 6 days of training. Select from over 50 tutorials taught by highly expert instructors, including:

- Gerald Carter on *Ethereal* and the Art of Debugging Networks
- Richard Bejtlich on TCP/IP Weapons
- Eileen Frisch on Administering Linux in Production Environments
- Chip Salzenberg on Higher-Order Perl

In addition to the training, 3 days of technical sessions include top-notch refereed papers, informative invited talks, expert Guru Is In sessions, and the popular Hit the Ground Running track.

Our 20+ invited talks feature our most impressive slate of speakers to date, including:

- Keynote: "Hollywood's Secret War on Your NOC," by Cory Doctorow, co-editor of *Boing Boing* and former Director of European Affairs for the EFF
- "Open Source Software and Its Role in Space Exploration," by DJ Byrne, Jet Propulsion Laboratory
- "Teaching Problem Solving: You Can and You Should," by Elizabeth Zwicky, Acuitus
- "Corporate Security: A Hacker Perspective," by Mark "Simple Nomad" Loveless, Vernier Networks, Inc.
- "Black Ops 2006: Pattern Recognition," by Dan Kaminsky, DoxPara Research
- "High Availability: From Luxury to Commonplace Necessity in 10 Years," by Eric Hennessey, Symantec Corp.

LISA is the premier forum for presenting new research in system administration. We selected papers from over 40 submissions, showcasing state-of-the-art work on topics including system and network management, theory, visualization, security, electronic mail, and more.

Get a head start on key technologies with 15-minute talks in the Hit the Ground Running track. Find out about the basic concepts, what acronyms you will encounter, and what Web sites and books are the best resources. Topics include Mac OS X, bcfg2, Puppet, Building a Linux RAC Cluster, and more.

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

Explore the latest commercial innovations at the Vendor Exhibition.

Benefit from new opportunities for peer interaction around the topics that mean the most to you.

Early registration discounts for LISA '06, taking place December 3-8, 2006, in Washington, D.C., are now available. Register by Friday, November 10, and save up to \$300!

We're pleased to bring LISA to Washington, D.C., and look forward to seeing you there.

William LeFebvre
LISA '06 Program Chair



LISA '06 Organizers

Program Chair

William LeFebvre, *Independent Consultant*

Program Committee

Narayan Desai, *Argonne National Laboratory*

Peter Galvin, *Corporate Technologies, Inc.*

Trey Harris, *Amazon.com*

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

Adam Moskowitz, *Upromise, Inc.*

Mario Obejas, *Raytheon*

Tom Perrine, *Sony Computer Entertainment America*

W. Curtis Preston, *GlassHouse Technologies*

Amy Rich, *Tufts University*

Marc Staveley, *SOMA Networks, Inc.*

Rudi Van Drunen, *Leiden Cytology and Pathology Labs*

Alexios Zavras, *IT Consultant*

Invited Talk Committee

David N. Blank-Edelman, *Northeastern University CCIS*

Doug Hughes, *Global Crossing*

Guru Is In Coordinator

Philip Kizer, *Estacado Systems*

Workshops Coordinator

Luke Kanies, *Reductive Labs*

Work-in-Progress Session Coordinator

Esther Filderman, *Pittsburgh Supercomputing Center*

The USENIX Association Staff



Register today at www.usenix.org/lisa2006.

TRAINING AT A GLANCE

SUNDAY, DECEMBER 3

FULL DAY: 9:00 A.M.–5:00 P.M.

- S1** Peter Baer Galvin **NEW!** Solaris 10 Administration Workshop
- S2** Richard Bejtlich **NEW!** TCP/IP Weapons School (Day 1 of 2)
- S3** John Sellens System and Network Monitoring: Tools in Depth
- S4** Aileen Frisch Administering Linux in Production Environments
- S5** Rik Farrow **NEW!** Linux Server Security Hands-On
- S6** Tom Christiansen Advanced Perl Programming

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

- S7** William LeFebvre Introduction to Domain Name System Administration
- S8** Theodore Ts'o **NEW!** Bzr, Hg, and Git, Oh My! Distributed Source Code Management Systems
- S9** Gerald Carter **NEW!** So You Have Active Directory: Now What? (A Guide to AD Integration for UNIX Sysadmins)

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

- S10** William LeFebvre Intermediate Topics in Domain Name System Administration
- S11** Michael Lucas **NEW!** Netflow on the Cheap
- S12** Gerald Carter Kerberos 5: Revenge of the Three-Headed Dog

MONDAY, DECEMBER 4

FULL DAY: 9:00 A.M.–5:00 P.M.

- M1** Marc Staveley System and Network Performance Tuning
- M2** Richard Bejtlich **NEW!** TCP/IP Weapons School (Day 2 of 2)
- M3** Lee Damon Issues in UNIX Infrastructure Design

MONDAY, DECEMBER 4 (CONTINUED)

FULL DAY: 9:00 A.M.–5:00 P.M. (CONTINUED)

- M4** Esther Filderman An Introduction to OpenAFS and Its Administration and Alf Wachsmann
- M5** Matt Larson Advanced Topics in DNS Administration

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

- M6** David Rhoades The Latest Hacking Tools and Defenses
- M7** Daniel L. Appelman **NEW!** Blogs and Spam: Legal Issues for the System Administrator
- M8** Aileen Frisch **NEW!** Beyond Shell Scripts: 21st-Century Automation Tools and Techniques
- M9** Gerald Carter Ethereal and the Art of Debugging Networks

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

- M10** Mike Ciavarella Documentation Techniques for Sysadmins
- M11** Adam Moskowitz **NEW!** How to Interview a System Administrator
- M12** John Sellens Databases: What You Need to Know
- M13** Strata Rose Chalup Project Troubleshooting

TUESDAY, DECEMBER 5

FULL DAY: 9:00 A.M.–5:00 P.M.

- T1** James Mauro and Richard McDougall Solaris 10 Performance, Observability, and Debugging
- T2** Abe Singer Building a Logging Infrastructure and Log Analysis for Security
- T3** Mike Ciavarella and Lee Damon Seven Habits of the Highly Effective System Administrator: Hints, Tricks, Techniques, & Tools of the Trade
- T4** Gerald Carter Managing Samba 3.0
- T5** John Gannon and John Arrasjid Introduction to VMware ESX Server

**Early
Bird
Discount**

Register by November 10, 2006, and SAVE!
www.usenix.org/lisa2006

TUESDAY, DECEMBER 5 (CONTINUED)

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

- T6** Murray Kucherawy **NEW!** Hitchhiker's Guide to Email Sender Authentication
- T7** Jacob Farmer Disk-to-Disk Backup and Eliminating Backup System Bottlenecks
- T8** David N. Blank-Edelman Over the Edge System Administration, Vol. 1
- T9** Rik Farrow **NEW!** Firewalls and Internet Security for Mac OS X

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

- T10** Murray Kucherawy **NEW!** Writing Filters Using “milter”
- T11** Jacob Farmer Next Generation Storage Networking
- T12** David N. Blank-Edelman **NEW!** Over the Edge System Administration, Vol. 2
- T13** Rudi van Drunen **NEW!** Enterprise Wireless Network Setup

WEDNESDAY, DECEMBER 6

FULL DAY: 9:00 A.M.–5:00 P.M.

- W1** Jeff Victor **NEW!** Resource Management with Solaris Containers
- W2** Gerald Carter Implementing [Open]LDAP Directories

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

- W3** Mike Ciavarella Advanced Shell Programming
- W4** Ed DeHart **NEW!** Internet Security for UNIX System Administrators
- W5** David N. Blank-Edelman **NEW!** Hackingⁿ Perl

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

- W6** Abe Singer Security Without Firewalls
- W7** Ed DeHart **NEW!** Setting Up a Data Center (or Data Closet)
- W8** Strata Rose Chalup **NEW!** Problem-Solving for IT Professionals

THURSDAY, DECEMBER 7

FULL DAY: 9:00 A.M.–5:00 P.M.

- R1** Peter Baer Galvin and Marc Staveley Solaris 10 Security Features Workshop
- R2** Joshua Jensen Linux Systems Administration

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

- R3** Tom Limoncelli Time Management: Getting It All Done and Not Going (More) Crazy!
- R4** Strata Rose Chalup Practical Project Management for Sysadmins and IT Professionals
- R5** Chip Salzenberg Regular Expression Mastery

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

- R6** Evan Marcus Blueprints for High Availability
- R7** Gerald Carter **NEW!** Hot Swap File/Print Services from Windows to Samba
- R8** Chip Salzenberg **NEW!** Higher-Order Perl

FRIDAY, DECEMBER 8

FULL DAY: 9:00 A.M.–5:00 P.M.

- F1** Richard Bejtlich Network Security Monitoring with Open Source Tools
- F2** Don Bailey **NEW!** Wi-Fi, WiMAX, RFID, UWB, Zigbee, Bluetooth, et al. for Dummies . . . and You

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

- F3** Evan Marcus Disaster Planning (and Recovery): How to Keep Your Company (and Your Job) Alive
- F4** Michael Cucchi **NEW!** Wide Area Storage Networking: Server Consolidation and Data Protection Over the WAN
- F5** Chip Salzenberg Perl Program Repair Shop and Red Flags

TRAINING PROGRAM

SUNDAY, DECEMBER 3

FULL DAY 9:00 A.M.–5:00 P.M.

S1 SOLARIS 10 ADMINISTRATION WORKSHOP **NEW!**

Peter Baer Galvin, *Corporate Technologies, Inc.*

Who should attend: Solaris system managers and administrators interested in learning the new administration features in Solaris 10 (and features in previous Solaris releases that they may not be using).

Topics include:

- Overview
- Solaris releases
- Installing and upgrading to Solaris 10
- Patching
- Service Management Facility (lab)
- The kernel
- Crash and core dumps
- Cool commands
- ZFS (lab)
- N1 Grid Containers (a.k.a. Zones) (lab)
- Dtrace
- FMA
- Performance
- Networking
- Sysadmin best practices

S2 TCP/IP WEAPONS SCHOOL (Day 1 of 2) **NEW!**

Richard Bejtlich, *TaoSecurity*

Who should attend: Junior and intermediate analysts and system administrators who detect and respond to security incidents.

Course plan: The class will concentrate on the protocols and services most likely to be encountered when performing system administration and security work. Students will inspect traffic such as would be seen in various malicious security events.

Topics for Day 1 include:

- Hardware and network design
- Layer 1
- Layer 1 attack: Rogue access point
- Layer 2

S3 SYSTEM AND NETWORK MONITORING: TOOLS IN DEPTH

John Sellens, *SYONEX*

Who should attend: Network and system administrators ready to implement comprehensive monitoring of their systems and networks using the best freely available tools. Participants should have an understanding of the fundamentals of networking, familiarity with computing and network components, UNIX system administration experience, and some understanding of UNIX programming and scripting languages.

Topics include, for each of Nagios, Cricket, MRTG, and Orca:

- Installation
- Configuration, setup options, and how to manage larger and nontrivial configurations
- Reporting and notifications, both proactive and reactive
- Special cases
- Extending the tools
- Dealing effectively with network boundaries and remote sites
- Security concerns and access control
- Ongoing operations

S4 ADMINISTERING LINUX IN PRODUCTION ENVIRONMENTS

Aleen Frisch, *Exponential Consulting*

Who should attend: Linux sysadmins looking to learn about the latest developments and problem-solving techniques; administrators from sites considering converting to Linux or adding Linux systems to their current resources.

Topics include:

- Recent kernel developments
- High-performance I/O
- Advanced compute-server environments
- High availability Linux: fault-tolerance options
- Enterprise-wide authentication and other security features
- Automating installations and other mass operations
- Linux performance tuning

S5 LINUX SERVER SECURITY HANDS-ON **NEW!**

Rik Farrow, *Security Consultant*

Who should attend: Both Linux and UNIX system administrators. Some experience with command-line UNIX tools is required to get the most out of this class. Security analysts and managers can also take this class and learn what must be done to create secure Linux systems.

Topics include:

- Checking for low-hanging fruit that can aid an attacker, such as bad file permissions, dangerous SUID files, and backdoors
- Defending servers against network-based attacks via proper service configuration
- Using local firewalls to both block potential attacks and blunt successful attacks
- Running servers within a chrooted environment
- Using secure remote administration
- Running Apache securely through proper configuration and through checking CGI scripts or programs for exploitable features
- Keeping your servers properly updated and vulnerability-free
- Setting up effective logging

S6 ADVANCED PERL PROGRAMMING

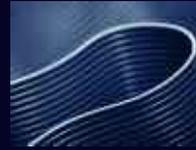
Tom Christiansen, *Consultant*

Who should attend: Perl programmers with at least a journeyman-level working knowledge of Perl programming and a desire to hone their skills.

Topics include:

- Symbol tables and typeglobs
- Modules
- References
- Fancy object-oriented programming
- Managing exceptions and warnings
- Regular expressions
- Programming with multiple processes or threads
- Unicode and I/O layers

See www.usenix.org/lisa06/training
for complete training program info.



HALF DAY MORNING: 9:00 A.M.–12:30 P.M. AFTERNOON: 1:30 P.M.–5:00 P.M.

**S7 INTRODUCTION TO DOMAIN NAME
(AM) SYSTEM ADMINISTRATION**

William LeFebvre, *Consultant*

Who should attend: System or network administrators who have been exposed to the Domain Name System only as users. A basic understanding of the IP protocols, TCP and UDP, data encapsulation, and the seven-layer model will be beneficial.

Topics include:

- DNS and BIND
- The DNS name hierarchy
- The four components of the DNS protocol
- Iterative vs. recursive querying
- Essential resource records: SOA, A, PTR, CNAME, NS
- Zone transfers and secondaries
- Vendor-specific differences

**S8 BZR, HG, AND GIT, OH MY!
(AM) DISTRIBUTED SOURCE CODE
MANAGEMENT SYSTEMS NEW!**

Theodore Ts'o, *IBM Linux Technology Center*

Who should attend: Developers, project leaders, and system administrators dealing with source code management systems who want to take advantage of the newest distributed development tools.

Are you still using CVS or SVN? Find out what you've been missing! This tutorial will describe the basic concepts of distributed SCMs and provide gentle instructions on how these systems work and how to use them. It will also compare and contrast the strengths and weaknesses of these systems and will provide guidance and suggestions so that project leaders can choose the distributed SCM that is most appropriate for their project.

**S9 SO YOU HAVE ACTIVE DIRECTORY:
(AM) NOW WHAT? (A GUIDE TO AD INTE-
GRATION FOR UNIX SYSADMINS)
NEW!**

Gerald Carter, *Centeris*

Who should attend: System administrators who are tasked with integrating authentication, Web, and file/print services provided by UNIX hosts into an Active Directory domain.

Topics include:

- AD domain membership using Samba
- NTLM and Kerberos authentication for Apache
- Using PAM for NTLM and Kerberos authentication
- Searching Active Directory using LDAP clients

**S10 INTERMEDIATE TOPICS IN DOMAIN
(PM) NAME SYSTEM ADMINISTRATION**

William LeFebvre, *Consultant*

Who should attend: Network administrators with a basic understanding of DNS and its configuration who need to learn how to create and delegate subdomains, and administrators planning to install BIND8. Attendees are expected either to have prior experience with DNS, including an understanding of basic operation and zone transfers, or to have attended the "Introduction to Domain Name System Administration" tutorial.

Topics include:

- Subdomains and delegation
- Resource records: NS, RP, MX, TXT, AAAA
- BIND views
- DNS management tools
- DNS design
- DNS and firewalls

**S11 NETFLOW ON THE CHEAP NEW!
(PM) Michael W. Lucas, Consultant**

Who should attend: Anyone who wants to learn to easily architect a NetFlow system to solve technical problems and resolve administrative and social problems.

NetFlow is an extremely powerful network management tool with a reputation for being obtuse and expensive. I will present a coherent, start-to-finish solution that will work in any vaguely modern environment and can be assembled out of a few gigs of disk, some cards and cables, a free UNIX, and freely available software, while also leveraging any Cisco hardware the students have.

**S12 KERBEROS 5: REVENGE OF THE
(PM) THREE-HEADED DOG**

Gerald Carter, *Centeris*

Who should attend: Administrators who want to understand Kerberos 5 implementations on both UNIX/Linux and Windows clients and servers.

Topics include:

- Key concepts of the Kerberos 5 protocol
- Related authentication interfaces such as SASL and GSSAPI
- The specifics of implementing Krb5 realms
- Implementations of Krb5 cross-realm trusts
- Integration of Windows and UNIX/Linux clients into Krb5 realms
- Possible pitfalls of using popular Krb5 implementations such as those of MIT and Windows 200x

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.

TRAINING PROGRAM

MONDAY, DECEMBER 4

FULL DAY 9:00 A.M.–5:00 P.M.

M1 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.

Topics include:

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

M2 TCP/IP WEAPONS SCHOOL (Day 2 of 2)

NEW!

Richard Bejtlich, *TaoSecurity*

See S2 for the description of the first day of this tutorial.

Who should attend: Junior and intermediate analysts and system administrators who detect and respond to security incidents.

Topics for Day 2 include:

- Layer 2 attacks
- Layer 3
- Layer 3 attacks

Attention Managers: Why You Should Send Your Employees to LISA '06

Technology continues to evolve. Truly to stay ahead of the game, your employees must continue to enhance their skills.

The training program at LISA '06 offers a cost-effective, one-stop shop for training current IT and development employees. 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 configuration management.

M3 ISSUES IN UNIX INFRASTRUCTURE DESIGN

Lee Damon, *University of Washington*

Who should attend: Anyone who is designing, implementing, or maintaining a UNIX environment with 2 to 20,000+ hosts. System administrators, architects, and managers who need to maintain multiple hosts with few admins.

Topics include:

- Administrative domains
- Desktop services vs. farming
- Disk layout
- Free vs. purchased solutions
- Homogeneous vs. heterogeneous
- The essential master database
- Policies to make life easier
- Push vs. pull
- Getting the user back online in 5 minutes
- Remote administration
- Scaling and sizing
- Security vs. sharing
- Single sign-on
- Single system images
- Tools

Combining full days of training with days of technical sessions on groundbreaking research related to system and network administration makes the LISA '06 experience even more valuable. Additionally, the evening receptions and Birds-of-a-Feather 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.

M4 AN INTRODUCTION TO OPENAFS AND ITS ADMINISTRATION

Esther Filderman, *Pittsburgh Supercomputing Center*, and Alf Wachsmann, *Stanford Linear Accelerator Center*

Who should attend: Anyone looking to learn more about OpenAFS and how to set up and administer an OpenAFS cell.

Topics include:

- Overview of AFS concepts and semantics
- Setting up and managing the AFS client (even without your own servers)
- A working outline of the AFS server processes and how they play together
- How to set up a new AFS cell: design decisions, initial setup, planning for the future
- Authentication issues: Native KAS vs. Kerberos5
- Backups: How and what to choose to use
- AFS tools to make everything from maintenance to monitoring easier

M5 ADVANCED TOPICS IN DNS ADMINISTRATION

Matt Larson, *VeriSign, Inc.*

Who should attend: DNS administrators who wish to extend their understanding of how to configure and manage name servers running BIND 9. Attendees should have some experience of running a name server and be familiar with DNS jargon, resource records, and the syntax of zone files and named.conf.

Topics include:

- The BIND 9 logging subsystem
- Managing the name server with rndc
- Configuring split DNS: internal and external versions of a domain
- Securing the name server
- Security
- Dynamic DNS (DDNS)
- IPv6

Please see
www.usenix.org/lisa06/training
for full tutorial descriptions.

HALF DAY MORNING: 9:00 A.M.–12:30 P.M. AFTERNOON: 1:30 P.M.–5:00 P.M.

M6 THE LATEST HACKING TOOLS AND (AM) DEFENSES

David Rhoades, *Maven Security Consulting, Inc.*

Who should attend: Anyone who is interested in how hackers work these days, and what system and network administrators can do to defend themselves.

Topics may include:

- VoIP security
- Phishing
- Reverse engineering
- Anti-forensics
- Wi-Fi and Bluetooth
- Web application attacks
- Spyware and malware
- Network tools
- Denial of service attacks

M7 BLOGS AND SPAM: LEGAL ISSUES (AM) FOR THE SYSTEM ADMINISTRATOR

NEW!

Daniel L. Appelman, *Heller Ehrman LLC*

Who should attend: System administrators and others facing these legal and ethical issues.

Topics include:

- CAN-SPAM and what it means for the system administrator
- New FTC rules implementing CAN-SPAM
- Blogging issues for the system administrator
- The role of company policies with respect to spam and blogging
- Recommendations for the sysadmin

M8 BEYOND SHELL SCRIPTS: 21ST- (AM) CENTURY AUTOMATION TOOLS AND TECHNIQUES NEW!

Aileen Frisch, *Exponential Consulting*

Who should attend: System administrators who want to explore new ways of automating administrative tasks.

Topics include:

- Cfengine
- Expect: Automating interactive processes
- Bacula, an enterprise backup management facility

M9 ETHEREAL AND THE ART OF (AM) DEBUGGING NETWORKS

Gerald Carter, *Centeris*

Who should attend: System and network administrators who are interested in learning more about the TCP/IP protocol and how network traffic monitoring and analysis can be used as a debugging, auditing, and security tool.

Topics include:

- Introduction to Ethereal for local and remote network tracing
- TCP/IP protocol basics
- Analysis of popular application protocols such as DNS, DHCP, HTTP, NFS, CIFS, and LDAP
- How some kinds of TCP/IP network attacks can be recognized

M10 DOCUMENTATION TECHNIQUES (PM) FOR SYSADMINS

Mike Ciavarella, *University of Melbourne*

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

Topics include:

- Why system administrators need to document
- The document life cycle
- Targeting your audience
- An adaptable document framework
- Common mistakes
- Tools to assist the documentation process

M11 HOW TO INTERVIEW A SYSTEM (PM) ADMINISTRATOR NEW!

Adam Moskowitz, *Upromise, Inc.*

Who should attend: System administrators of all levels of experience, as well as managers of system administrators.

Topics include:

- Purposes of an interview
- Basic questions to bear in mind
- Preparatory questions
- How to interview someone who knows more than you do
- How, as an interviewee, to turn a bad question into a better one

M12 DATABASES: WHAT YOU NEED TO (PM) KNOW

John Sellens, *SYONEX*

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

Topics include:

- An introduction to database concepts
- The basics of SQL (Structured Query Language)
- Common applications of databases
- Berkeley DB and its applications
- MySQL installation, configuration, and management
- PostgreSQL installation, configuration, and management
- Security, user management, and access controls
- Ad-hoc queries with standard interfaces
- ODBC and other access methods
- Database access from other tools (Perl, PHP, sqsh, etc.)

M13 PROJECT TROUBLESHOOTING

(PM) Strata Rose Chalup, *Project Management Consultant*

Who should attend: Anyone with an existing project that isn't going well, and they're not sure why, or with a big initiative at work that they'd like to turn into a project but can't seem to get beyond a certain point with it; anyone who's been getting involved with open source software development, and things have gotten complex now that more folks are on board. If you've been thinking, "Hey, if we had a little more structure, we could get a lot more accomplished," this tutorial is for you.

TRAINING PROGRAM

TUESDAY, DECEMBER 5

FULL DAY 9:00 A.M.–5:00 P.M.

T1 SOLARIS 10 PERFORMANCE, OBSERVABILITY, & DEBUGGING

James Mauro and Richard McDougall, *Sun Microsystems*

Who should attend: Anyone who supports or may support Solaris 10 machines. An overview of the tools and utilities will be followed by a drill-down on applying them to resolve performance issues and pathological behavior.

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

T2 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.

Topics include:

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

Please see
www.usenix.org/lisa06/training
for full tutorial descriptions.

T3 SEVEN HABITS OF THE HIGHLY EFFECTIVE SYSTEM ADMINISTRATOR: HINTS, TRICKS, TECHNIQUES, & TOOLS OF THE TRADE

Mike Ciavarella, *University of Melbourne*, and Lee Damon, *University of Washington*

Who should attend: Junior system administrators with anywhere from little to 3+ years of experience in computer system administration.

Topics include:

- Why your computers should all agree on what time it is
- Why root passwords should not be the same on every computer
- Why backing up every filesystem on every computer is not always a good idea
- Policies: where you want them and where you might want to avoid them
- Ethical issues
- Growth and success as a solo-sysadmin as well as in small, medium, and large teams
- Training, mentoring, and personal growth planning
- Site planning, budgeting, and logistics
- Books that can help you and your users

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.

T4 MANAGING SAMBA 3.0

Gerald Carter, *Centeris*

Who should attend: System administrators who are currently managing Samba servers or are planning to deploy new servers this year.

Topics include:

- Providing basic file and print services
- Centrally managing printer drivers for Windows clients
- Configuring Samba's support for Access Control Lists and the Microsoft Distributed File System
- Making use of Samba VFS modules for features such as virus scanning and a network recycle bin
- Integrating with Windows NT 4.0 and Active Directory authentication services
- Implementing a Samba primary domain controller along with Samba backup domain controllers
- Migrating from a Windows NT 4.0 domain to a Samba domain
- Utilizing account storage alternatives to smbpasswd such as LDAP

T5 INTRODUCTION TO VMWARE ESX SERVER

John Gannon and John Arrasjid, *VMware*

Who should attend: System administrators and architects who are interested in deploying VMware ESX Server in a production environment. No prior experience with VMware products is required. Knowledge of Linux is helpful; basic knowledge of SANs is useful but not required.

Topics include:

- Virtual infrastructure overview
- ESX Server overview
- Installation and configuration
- Virtual Machine (VM) creation and operation
- Operations and administration best practices
- Advanced configuration (SAN and networking)

Please see
www.usenix.org/lisa06/training
for full tutorial descriptions.

HALF DAY MORNING: 9:00 A.M.–12:30 P.M. AFTERNOON: 1:30 P.M.–5:00 P.M.

T6 HITCHHIKER'S GUIDE TO EMAIL
(AM) SENDER AUTHENTICATION NEW!

Murray Kucherawy, *Sendmail, Inc.*

Who should attend: System administrators familiar with email concepts who want to get their feet wet in the emerging area of email sender authentication.

Topics include:

- Why sender authentication is necessary
- Why not PGP or S/MIME?
- Simple client checks
- Path-based methods
- Crypto-based methods
- Best common practices
- Reputation: RBLs, Vipul's Razor

T7 DISK-TO-DISK BACKUP AND
(AM) ELIMINATING BACKUP SYSTEM
BOTTLENECKS

Jacob Farmer, *Cambridge Computer*

Who should attend: System administrators involved in the design and management of backup systems and policymakers responsible for protecting their organization's data. Some familiarity with server and storage hardware is assumed.

Topics include:

- Identifying and eliminating backup system bottlenecks
- Conventional disk staging
- Virtual tape libraries
- Removable disk media
- Incremental forever and synthetic full backup strategies
- Block- and object-level incremental backups
- Information lifecycle management and nearline archiving
- Data replication
- CDP (Continuous Data Protection)
- Snapshots
- Current and future tape drives
- Capacity Optimization (Single-Instance File Systems)
- Minimizing or eliminating tape drives
- iSCSI

T8 OVER THE EDGE SYSTEM ADMINI-
(AM) STRATION, VOL. 1

David N. Blank-Edelman, *Northeastern University*

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

Topics include:

- New purposes for network transports
- 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 apps without lifting a finger
- How to use ordinary objects, such as Silly Putty, to make your life easier

T9 FIREWALLS AND INTERNET
(AM) SECURITY FOR MAC OS X NEW!

Rik Farrow, *Security Consultant*

Who should attend: Mac OS X users and administrators; security wonks.

Topics include:

- Configuring ipfw using the GUI
- IP as it applies to firewalls and Internet security
- Using ipfw firewalls
- Mac OS X IP protocols
- Using ipfw to control network access to your Mac OS X systems

T10 WRITING FILTERS USING "MILTER"
(PM) NEW!

Murray Kucherawy, *Sendmail, Inc.*

Who should attend: Sysadmins and developers familiar with email concepts who want to write applications to plug into the sendmail MTA to monitor and control the flow and content of email.

Topics include:

- Phases of SMTP
- The callbacks milter offers
- How threads are used in milter
- Writing a basic filter with the milter API
- Registering the filter with Sendmail
- Handling failures
- Related known limitations
- Examples of applications

T11 NEXT GENERATION STORAGE
(PM) NETWORKING

Jacob Farmer, *Cambridge Computer*

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

Topics include:

- Basics of storage virtualization
- Shortcomings of SAN and NAS
- Virtualization architectures
- The latest storage interfaces
- Content-Addressable Storage (CAS)
- Information Life Cycle Management
- Hierarchical Storage Management
- The convergence of SAN and NAS
- High-performance file sharing
- Parallel file systems
- SAN-enabled file systems
- Wide-area file systems (WAFS)

T12 OVER THE EDGE SYSTEM ADMINI-
(PM) STRATION, VOL. 2 NEW!

David N. Blank-Edelman, *Northeastern University*

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

Topics include:

- How to benefit from side effects
- Arts and crafts for sysadmins
- Web apps as sysadmin tools
- How to perform SQL queries on your network equipment
- How to use even more ordinary objects to make your life easier

T13 ENTERPRISE WIRELESS NETWORK
(PM) SETUP NEW!

Rudi van Drunen, *Leiden Pathology and Cytology Labs, Leiden, The Netherlands*

Who should attend: Network professionals and sysadmins deploying wireless networks in an enterprise setting.

Topics include:

- Making a radio plan
- Selecting and placing access points
- Determining your cabling needs
- Designing the authentication/authorization infrastructure
- Setting up hardware and software

TRAINING PROGRAM

WEDNESDAY, DECEMBER 6

FULL DAY 9:00 A.M.–5:00 P.M.

HALF DAY

A.M.: 9:00 A.M.–12:30 P.M.

P.M.: 1:30 P.M.–5:00 P.M.

W1 RESOURCE MANAGEMENT WITH SOLARIS CONTAINERS **NEW!**

Jeff Victor, *Sun Microsystems*

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

Topics include:

- What are resources, and why would you want to manage them?
- Projects and Tasks
- Resource Controls
- Dynamic Resource Pools, including processor sets
- Physical Memory management with Resource Capping and Memory Sets
- Network bandwidth management with IPQoS
- Schedulers
- Application isolation with Zones

W2 IMPLEMENTING [OPEN]LDAP DIRECTORIES

Gerald Carter, *Centeris*

Who should attend: Both LDAP directory administrators and architects.

Topics include:

- Replacing NIS domains
- Integration with Samba file and print servers
- Integrating MTAs such as Sendmail and Postfix
- Creating address books for mail clients
- Managing user access to HTTP and FTP services
- Integrating with DHCP and DNS servers
- Scripting with the Net::LDAP Perl module
- Defining custom attributes and object classes

Please see

www.usenix.org/lisa06/training
for complete training program info.

W3 ADVANCED SHELL PROGRAMMING

(AM) Mike Ciavarella, *University of Melbourne*

Who should attend: Junior or intermediate system administrators or anyone with a basic knowledge of programming.

Topics include:

- Common mistakes and unsafe practices
- Modular shell script programming
- Building blocks: awk, sed, etc.
- Writing secure shell scripts
- Performance tuning
- Choosing the right utilities for the job
- Addressing portability at the design stage
- When not to use shell scripts

W4 INTERNET SECURITY FOR UNIX

(AM) **SYSTEM ADMINISTRATORS **NEW!****

Ed DeHart, *aspStation, Inc.*

Who should attend: UNIX sysadmins and operations/support staff.

Topics include:

- Latest information on security problems
- UNIX system security
- Security policies

W5 HACKINGⁿ PERL **NEW!**

(AM) David N. Blank-Edelman, *Northeastern University*

Who should attend: Anyone who has ever had a nagging feeling that there might be ways to make hacking Perl easier and more efficient.

Topics include:

- The best development environments for Perl (editors, IDEs, etc.)
- How to find code that already does what you need (and the potential hazards of using that code)
- Tools that can help make coding Perl easier
- Ways to make debugging Perl code (your own or someone else's) easier
- Coding techniques that lead to less debugging

W6 SECURITY WITHOUT FIREWALLS

(PM) Abe Singer, *San Diego Supercomputer Center*

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

Topics include:

- The threat perspective from a data-centric point of view
- How to implement and maintain centralized configuration management
- Secure configuration and management of core network services
- Good system administration practices
- Implementing strong authentication
- A sound patching strategy
- How we recovered, and what we learned, from last year's compromise

W7 SETTING UP A DATA CENTER (OR DATA CLOSET) **NEW!**

Ed DeHart, *aspStation, Inc.*

Who should attend: Sysadmins in charge of multiple servers who are interested in learning more about how to build a server environment.

Topics include:

- Wiring best practices
- Ethernet: Switches, ConServers, etc.
- Remote access and control
- Active and standby power
- Cooling and ventilation
- Budget realities

W8 PROBLEM-SOLVING FOR IT

(PM) **PROFESSIONALS **NEW!****

Strata Rose Chalup, *Project Management Consultant*

Who should attend: IT support people who would like to have a better grasp of problem-solving as a discipline.

What this class will do for you:

- Give you a solid grounding in the process of solving problems
- Provide a framework on which to build troubleshooting techniques that are specific to your environment
- Build your confidence in your ability to apply logic to debug problems

TRAINING PROGRAM

THURSDAY, DECEMBER 7

FULL DAYS 9:00 A.M.–5:00 P.M.

HALF DAY

A.M.: 9:00 A.M.–12:30 P.M.

P.M.: 1:30 P.M.–5:00 P.M.

R1 SOLARIS 10 SECURITY FEATURES WORKSHOP

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

Who should attend: Solaris systems managers and administrators interested in the new security features in Solaris 10 or overlooked features in older releases.

Topics include:

- N1 Grid Containers (a.k.a. Zones) (lab)
- RBAC (lab)
- Privileges (lab)
- NFSv4
- Flash archives and live upgrade
- Moving from NIS to LDAP
- DTrace
- FTP client and server enhancements
- PAM enhancements
- Auditing enhancements
- BSM
- Service Management Facility (lab)
- Solaris Cryptographic Framework
- Smartcard interfaces and APIs
- Kerberos enhancements
- Packet filtering
- BART

R2 LINUX SYSTEM ADMINISTRATION

Joshua Jensen, *Cisco Systems Inc.*

Who should attend: Sysadmins who plan to implement Linux in a production environment.

Topics include (with an emphasis on security):

- Installation issues
- Boot loaders and system startup
- Disk partitioning and LVM
- Software RAID
- The RPM package system
- Networking
- User management
- Automated system installation
- Network-based authentication
- User accounts and management
- Network services and xinetd
- SSH: port tunneling, keys, tricks
- New developments

R3 TIME MANAGEMENT: GETTING IT ALL DONE AND NOT GOING (MORE) CRAZY!

Tom Limoncelli, *Google*

Who should attend: Sysadmins who want to improve their time-management skills, who want to have more control over their time and better follow-through on assignments.

Topics include:

- Why typical “time management” books don’t work for sysadmins
- How to delegate tasks effectively
- A way to keep from ever forgetting a user’s request
- Why “to do” lists fail and how to make them work
- Prioritizing tasks so that users think you’re a genius
- Getting more out of your Palm Pilot
- Having more time for fun (for people with a social life)
- How to leave the office every day with a smile on your face

R4 PRACTICAL PROJECT MANAGEMENT FOR SYSADMINS AND IT PROFESSIONALS

Strata Rose Chalup, *Project Management Consultant*

Who should attend: System administrators who want to stay hands-on as team leads or system architects and need a new set of skills with which to tackle bigger, more complex challenges.

Topics include:

- Quick basics of project management
- Skill sets
- Problem areas
- Project management tools

R5 REGULAR EXPRESSION MASTERY

(AM) Chip Salzenberg, *Cloudmark*

Who should attend: System administrators and users who use Perl, grep, sed, awk, procmail, vi, or emacs.

Topics include:

- Inside the regex engine
- Disasters and optimizations

R6 BLUEPRINTS FOR HIGH AVAILABILITY

(PM) Evan Marcus, *Aardvark Technologies, Ltd*

Who should attend: System administrators and data center managers, developers, IT managers.

Topics include:

- The relationship between cost and availability
- Our list of 20 key high availability design principles
- How you can get started down the path toward high availability without spending boatloads of money
- Simple and practical tools you can use right away

R7 HOT SWAP FILE/PRINT SERVICES

(PM) FROM WINDOWS TO SAMBA NEW!

Gerald Carter, *Centeris*

Who should attend: Administrators who are interested in transparently replacing Windows file/print servers with Samba running on UNIX/Linux servers.

Topics include:

- Understanding Samba’s use of POSIX Access Control Lists and Extended Attributes
- Maintaining Windows ACLs while moving files and directories
- Migrating printer queues, drivers, and settings
- Migrating users and groups from an NT4 domain controller

R8 HIGHER-ORDER PERL NEW!

(PM) Chip Salzenberg, *Cloudmark*

Who should attend: Programmers involved in the development and maintenance of large systems written partly or mostly in Perl.

Topics include:

- Dynamically replacing functions with facades
- Iterators
- Building complex parsers—easily!

TRAINING PROGRAM

FRIDAY, DECEMBER 8

FULL DAY 9:00 A.M.–5:00 P.M.

F1 NETWORK SECURITY MONITORING WITH OPEN SOURCE TOOLS

Richard Bejtlich, *TaoSecurity*

Who should attend: Anyone who wants to know what is happening on their network. Anyone with duties involving intrusion detection, security analysis, incident response, or network forensics.

Topics include:

- NSM theory
- Building and deploying NSM sensors
- Accessing wired and wireless traffic
- Full content tools: Tcpdump, Ethereal/Tetheral, Snort as packet logger
- Additional data analysis tools: Tcpreplay, Tcpflow, Ngrep, Netdude
- Session data tools: Cisco NetFlow, Fprobe, Flow-tools, Argus, SANCP
- Statistical data tools: Ipcad, Trafshow, Topdstat, Cisco accounting records
- Sguil (sguil.sf.net)
- Case studies, personal war stories, and attendee participation

F2 WI-FI, WIMAX, RFID, UWB, ZIGBEE, BLUETOOTH, ET AL. FOR DUMMIES ... AND YOU **NEW!**

Don Bailey, *Computer Security Engineer*

Who should attend: IT professionals involved or interested in anything wireless, particularly those interested in catching up on recently developed wireless technologies.

Topics include:

- The 802.11 family and where it stands today
- Bluetooth device attractions and security distractions, and the future of Bluetooth
- RFID basics and how to lock yourself out of your apartment
- Ultra-Wideband and how it will put A/V pros out of business
- What Zigbee is and why it has a silly name
- Cellular data advances such as EVDO, GPRS/EDGE/HSPDA . . . 30 Mbps?
- Satellite offerings and how bandwidth might get worse

HALF DAY A.M.: 9:00 A.M.–12:30 P.M.

F3 DISASTER PLANNING (AND (AM) RECOVERY): HOW TO KEEP YOUR COMPANY (AND YOUR JOB) ALIVE

Evan Marcus, *Aardvark Technologies, Ltd.*

Who should attend: Sysadmins and managers who want to know what they need to plan for, and how to carry out the plan if disaster ever strikes.

Topics include:

- What a DR plan should contain
- Four methods for testing your plan
- Downtime and data loss
- Methods and technologies for protecting data through a disaster
- How a disaster may affect the people responsible for recovery
- Case study of a company that survived 9/11

F4 WIDE AREA STORAGE NETWORKING: (AM) SERVER CONSOLIDATION AND DATA PROTECTION OVER THE WAN **NEW!**

Michael Cucchi, *Cambridge Computer*

Who should attend: Sysadmins, IT managers, and enterprise architects who are concerned with disaster recovery, data protection, server consolidation, and resource sharing over a WAN.

Topics include:

- Remote site backup techniques
- Continuous Data Protection (CDP)
- Storage encryption
- Capacity optimized storage devices and WAN accelerators
- Host-based vs. SAN-based vs. fabric-based replication
- Filesystem vs. volume-level vs. application-level replication
- Application fail-over
- The impact of latency on storage-intensive applications
- Compensating for WAN latencies
- WAN accelerators
- Wide Area File Services (WAFS)
- Email server consolidation

F5 PERL PROGRAM REPAIR SHOP AND (AM) RED FLAGS

Chip Salzenberg, *Cloudmark*

Who should attend: Anyone who writes Perl programs regularly. Participants should have at least three months' experience programming in Perl.

Topics may include:

- Families of variables
- Making relationships explicit
- Refactoring
- Programming by convention
- Conciseness
- Why you should avoid the "." operator
- Elimination of global variables
- Superstition
- The "use strict" zombies
- Repressed subconscious urges
- The cardinal rule of computer programming
- The psychology of repeated code
- What can go wrong with "if" and "else"
- The Condition That Ate Michigan
- Trying it both ways
- Structural vs. functional code
- Boolean values
- Programs that take two steps forward and one step back
- Programs that are 10% backslashes
- Unnecessary shell calls
- How (and why) to let "undef" be the special value
- Confusion of internal and external representations of data
- Tool use
- Learning to use a hammer
- The "swswsw" problem
- Avoiding special cases
- Using uniform data representations

There are no Friday afternoon half day tutorials.

TRAINING INSTRUCTORS



Daniel L. Appelman
M7

Daniel L. Appelman is a lawyer in the Silicon Valley office of a major international law firm. He has been practicing in the areas of cyberspace and

software law for many years. He was the lawyer for Berkeley Software Design in the BSDi/UNIX System Laboratories (AT&T) case. Dan is the attorney for the USENIX Association and for many tech companies. He is also founding chair of his firm's Information Technology practice group, is the former chair of the California Bar's Standing Committee on Cyberspace Law, and is a current member of the California Bar Business Law Section's Executive Committee, the Computer Law Association, and the American Bar Association's Cyberspace Committee.



John Arrasjid
T5

John Arrasjid has 20 years of experience in the computer science field. His experience includes work with companies such as AT&T, Amdahl, 3Dfx Inter-

active, 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.



Don Bailey
F2

Don Bailey is a D.C.-area computer security engineer with nearly seven years of professional experience in the computer security industry. He holds a B.S. in

computer science from James Madison University. He has performed numerous vulnerability assessments and penetration tests, as well as exploit and virus evaluation, and has developed new secure laboratory technologies and architectures to support computer network attack-related experimentation and training. In recent years, Mr. Bailey has tested and evaluated a wide range of commercial and consumer wireless technology. His war-driving setup and wireless adventures have been covered by NBC, NPR, the *Washington Times*, and the *Baltimore Sun*. Commonly referred to as "Beetle," Mr. Bailey has presented on the topic of wireless security at a variety of security/hacker conferences.



Richard Bejtlich
S2, M2, F1

Richard Bejtlich is founder of TaoSecurity LLC (<http://www.taosecurity.com>), a company that helps clients detect, contain, and remediate intrusions using net-

work security monitoring (NSM) principles. Richard was previously a principal consultant at Foundstone, performing incident response, emergency NSM, and security research and training. He has created NSM operations for ManTech International Corporation and Ball Aerospace & Technologies Corporation. From 1998 to 2001, Richard defended global American information assets in the Air Force Computer Emergency Response Team (AFCERT), performing and supervising the real-time intrusion detection mission. Richard wrote the *Tao of Network Security Monitoring: Beyond Intrusion Detection* and the forthcoming *Extrusion Detection: Security Monitoring for Internal Intrusions and Real Digital Forensics*. He also wrote original material for *Hacking Exposed, 4th Ed.*, *Incident Response, 2nd Ed.*, and *Sys Admin* magazine.



David N. Blank-Edelman
T8, T12, W5

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 is one of the LISA '06 Invited Talks co-chairs.



Gerald Carter
S9, S12, M9, T4, W2, R7

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. Currently employed by Centeris as a Samba and open source developer, Gerald has written books for SAMS Publishing and for O'Reilly Publishing.



Strata Rose Chalup
M13, W8, R4

Strata Rose Chalup (M13, W8, R4) began as a fledgling sysadmin in 1983 and has been leading and managing complex IT projects for many years, serv-

ing in roles ranging from Project Manager to Director of Network Operations. She has written a number of articles on management and working with teams and has applied her management skills on various volunteer boards, including BayLISA and SAGE. Strata has a keen interest in network information systems and new publishing technologies and built a successful consulting practice around being an avid early adopter of new tools, starting with *ncsa_httpd* and C-based CGI libraries in 1993 and moving on to wikis, RSS readers, and blogging. Another MIT dropout, Strata founded VirtualNet Consulting in 1993.

Please see
www.usenix.org/lisa06/training
for complete training program info.

TRAINING INSTRUCTORS



Tom Christiansen

S6

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

M10, T3, W3

Mike Ciavarella has been producing and editing technical documentation since 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 now divides his time between teaching software engineering, providing expert testimony in computer security matters, and trying to complete a Doctorate. In his ever-diminishing spare time, Mike is a caffeine addict and photographer.



Michael Cucchi

F4

Michael Cucchi has over 13 years of IT experience. He spent seven of those years as a lead Linux/UNIX/Windows senior system admin and lead

system administrator for a major data center for the Federal Department of Transportation. Michael did a two-year stint as a solution engineer for Ammasso, where he helped launch the first RDMA Ethernet NIC. Mike is currently a consultant for Cambridge Computer, a national integrator of data protection and storage networking technologies.



Lee Damon

M3, T3

Lee Damon has a B.S. in Speech Communication from Oregon State University. He has been a UNIX system administrator since 1985 and has been active

in SAGE since its inception. He assisted in developing a mixed AIX/SunOS environment at IBM Watson Research 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.



Ed DeHart

W4, W7

Ed DeHart is a former member of the CERT Coordination Center, which he helped found in 1988. The CERT was formed by the Defense Advanced

Research Projects Agency (DARPA) to serve as a focal point for the computer security concerns of Internet users. Ed is currently the president of aspStation, Inc., a data center for server co-location.



Rudi van Drunen

T13

Rudi van Drunen met UNIX about 25 years ago at the University of Groningen (NL). Nowadays he is employed as head of information technology at a

medical lab in Leiden, The Netherlands, where he does UNIX system administration and applied research in image analysis and neural networks. He is one of the tech gurus at Wireless Leiden, the leading wireless community in the Netherlands, and he has his own open source consultancy company, Xlex-it. He has taught a number of classes and given invited talks on wireless topics at SANE.



Jacob Farmer

T7, T11

Jacob Farmer is a well-known figure in the data storage industry. He has authored 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

S5, T9

Rik Farrow provides UNIX and Internet security consulting and training. He has been working with UNIX system security since 1984 and with TCP/IP networks

since 1988. He has taught at the IRS, Department of Justice, NSA, NASA, U.S. West, Canadian RCMP, Swedish Navy, and for many U.S. and European user groups. He is the author of *UNIX System Security*, published by Addison-Wesley in 1991, and *System Administrator's Guide to System V* (Prentice Hall, 1989). Farrow is the editor of *login*. Rik lives with his family in the high desert of northern Arizona and enjoys hiking and mountain biking when time permits.



Esther Filderman

M4

Esther Filderman has been working with AFS since its infancy at CMU, before it was called AFS, and is currently Senior Operations Specialist and AFS admin-

istrator for the Pittsburgh Supercomputing Center. She has been working to bring AFS content to LISA conferences since 1999. She is also coordinating documentation efforts for the OpenAFS project.

**Early
Bird
Discount**

Register by November 10, 2006, and SAVE!
www.usenix.org/lisa2006



Eileen Frisch

S4, M8

Eileen Frisch has been a system administrator for over 20 years. She currently looks after a pathologically heterogeneous network of UNIX and Win-

dows systems. She is the author of several books, including *Essential System Administration* (now in its 3rd edition).



Peter Baer Galvin

S1, R1

Peter Baer Galvin is the Chief Technologist for Corporate Technologies, Inc., a systems integrator and VAR, and was the Systems Manager for Brown Univer-

sity's Computer Science Department. He has written articles for *Byte* and other magazines. He wrote the "Pete's Wicked World" and "Pete's Super Systems" columns at *SunWorld*. He is currently contributing editor for *Sys Admin*, where he manages the Solaris Corner. 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, and high availability.



John Gannon

T5

John Gannon (T5) has over ten years of experience architecting and implementing UNIX, Linux, and Windows infrastructures.

John has worked in net-

work engineering, operations, and professional services roles with various companies including Sun Microsystems, University of Pennsylvania, Scient Corporation, and FOX Sports. John's current work at VMware involves delivering server consolidation, disaster recovery, and virtual infrastructure solutions to FORTUNE 500 clients.



Joshua Jensen

R2

Joshua Jensen has worked for IBM and Cisco Systems, and was Red Hat's first instructor, examiner, and RHCE. He worked with Red Hat for

four and a half years, during which he wrote and maintained large parts of the Red Hat curriculum: Networking Services and Security, System Administration, Apache and Secure Web Server Administration, and the Red Hat Certified Engineer course and exam. Joshua has been working with Linux since 1996 and finds himself having come full circle: he recently left IBM to work with Red Hat Linux for Cisco Systems.



Murray Kucherawy

T6, T10

Murray Kucherawy has been actively involved in email system administration and software development since 1990 and has been awarded two related

patents, with a third pending. He has been with Sendmail, Inc., for seven years as a senior software engineer. Prior to that he completed a six-year tour of duty in the Internet Service Provider industry, and also worked for three terms as a staff member in computing and information technology at the University of Waterloo. He is currently working with the IETF to advance the progress of sender authentication issues through the standards process.



Matt Larson

M5

Matt Larson works in the Advanced Products and Research Group of VeriSign Information Services as a specialist in DNS protocol and opera-

tional issues. He is the co-author of the O'Reilly & Associates *Nutshell Handbooks DNS on Windows Server 2003*, *DNS on Windows 2000*, and *DNS on Windows NT*. Matt joined VeriSign in June 2000 from Acme Byte & Wire, a company he started in 1997 with co-author Cricket Liu. Prior to Acme Byte & Wire, Matt worked for five years at Hewlett-Packard, first in the Corporate Network Services group, where he ran hp.com, one of the largest corporate domains in the world. He later joined HP's professional services organization.



William LeFebvre

S7, S10

William LeFebvre is an author, programmer, teacher, and sysadmin expert who has been using UNIX and Internet technologies since 1983. He

wrote a monthly column for *UNIX Review* and has taught since 1989 for such organizations as USENIX, the Sun User Group (SUG), MIS Training Institute, IT Forum, and Great Circle Associates. He has contributed to several widely used UNIX packages, including Wietse Venema's logdaemon package. He is also the primary programmer for the popular UNIX utility top. William is currently an independent consultant. He received his bachelor's degree in 1983 and his master of science degree in 1988, both from Rice University.

TRAINING INSTRUCTORS



Tom Limoncelli

R3

Tom Limoncelli, author of O'Reilly's *The Art of Time Management for System Administrators* and co-author of *The Practice of System and Network*

Administration from Addison-Wesley (second edition to be premiered at this conference), is a system administrator at Google in NYC. He received the SAGE 2005 Outstanding Achievement award. A sysadmin and network wonk since 1987, he has worked at Cibernet, Dean for America, Lumeta, Bell Labs/Lucent, AT&T, Mentor Graphics, and Drew University. He is a frequent presenter at LISA conferences.

Michael W. Lucas

S11

Michael W. Lucas (<http://www.blackhelicopters.org/~mwluca>) is a network engineer whose UNIX experience is old enough to drink. He's

worked on networks that span the planet, networks with three people on them, and just about everything in between. Lucas is the author of several critically acclaimed books, including *Absolute BSD*, *Absolute OpenBSD*, *Cisco Routers for the Desperate*, and *PGP & GPG*. He has a slew of certifications for assorted security vendor products, as well as a CISSP. He has spent the past few years eliminating the guesswork from network management and replacing it with fact-based troubleshooting.



Evan Marcus

R6, F3

Evan Marcus founded Aardvark Technologies in 1994 as a systems consulting company. Evan and Aardvark have produced many books, papers (white

and other colors), and tutorials. Along the way, Evan acquired more than 15 years of experience in UNIX systems, through (among other things) 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 clustering software applications for SunOS and Solaris to market. He also spent 2 years as a system administrator on the equities trading floor of a multinational trading institution. He is the lead author of *Blueprints for High Availability* from John Wiley & Sons and co-author and co-editor of *The Resilient Enterprise* from VERITAS Publications. He is a well-regarded and popular speaker on the design of highly available and disaster resilient systems, and on fixed-content storage archives.



James Mauro

T1

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 co-authored the first edition of *Solaris Internals* with Richard McDougall and has been writing about Solaris in various forums for the past eight years.



Richard McDougall

T1

Richard McDougall, had he lived 100 years ago, would have had the hood open on the first four-stroke internal combustion gaso-

line-powered vehicle, exploring new techniques for making improvements. He would be looking for simple ways to solve complex problems and helping pioneering owners understand how the technology works to get the most from their new experience. These days, McDougall uses technology to satisfy his curiosity. He is a Distinguished Engineer at Sun Microsystems, specializing in operating systems technology and system performance. He is co-author of *Solaris Internals* (Prentice Hall PTR, 2000) and *Resource Management* (Sun Microsystems Press, 1999).



Adam Moskowitz

M11

Adam Moskowitz in his roles as IT manager and senior system administrator, and on behalf of several of his consulting clients, has interviewed more candi-

dates for system administration positions than he can remember. By virtue of having worked for a lot of companies that are no longer in business, he has been a candidate for almost that many system administration positions. Over the years he's been asked good questions, bad questions, and horrible questions, and has seen candidates become flummoxed when asked what seemed like rather simple questions. All this plus his almost 30 years of experience in the field (not to mention a darned good ratio of interviews to job offers) have given Adam considerable field experience to draw on for this tutorial.

When he's not in an interview, Adam works as a system administrator at Upromise, Inc.—but only to support his hobby of judging barbecue contests and to keep food in his puppy's bowl.

**Early
Bird
Discount**

Register by November 10, 2006, and SAVE!
www.usenix.org/lisa2006



David Rhoades
M6

David Rhoades is a principal consultant with Maven Security Consulting, Inc. Since 1996, he has provided information protection services for various FOR-

TUNE 500 customers. His work has taken him across the U.S. and abroad to Europe and Asia, where he has lectured and consulted in various areas of information security. David has a B.S. in computer engineering from the Pennsylvania State University and has taught for the SANS Institute, the MIS Training Institute, and ISACA.



Chip Salzenberg
R5, R8, F5

Chip Salzenberg is Principal Engineer at Cloudmark, where he fights spam with flair and aplomb. Chip is also chief coder ("pump-

kin") of the Parrot virtual machine (<http://parrotcode.org>), with which Chip plans to bring all dynamic languages together and, in the darkness, dynamically bind them.

Chip is a well-known figure in the Perl and free and open source communities, having worked on free and open source software for over 20 years, Perl for 18 years, and Linux for 13 years. Chip was pumping for Perl release 5.4. He created the automated Linux install-and-test system for VA Linux Systems and was VA's Kernel Coordinator. Chip is a perennial presenter at the O'Reilly Open Source Conference and YAPC (Yet Another Perl Conference), teaches Perl and C++ commercially, and has been published by O'Reilly and Prentice Hall on Perl and other topics.

When away from his keyboard, Chip plays with (live) parrots and trains in Krav Maga. Chip's journal is at <http://pobox.com/~chip/journal/>.



John Sellens
S3, M12

John Sellens (S3, M12) has been involved in system and network administration since 1986 and is the author of several related USENIX papers, a num-

ber of *login*: articles, and the SAGE Short Topics in System Administration booklet #7, *System and Network Administration for Higher Reliability*. He holds an M.Math. in computer science from the University of Waterloo and is a chartered accountant. He is the proprietor of SYONEX, a systems and networks consultancy. 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.



Abe Singer
T2, W6

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 co-author of the SAGE booklet *Building a Logging Infrastructure* and author of a forthcoming O'Reilly book on log analysis.



Marc Staveley
M1, R1

Marc Staveley works with Soma Networks, where he is applying his many years of experience with UNIX development and administration in 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
S8

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
W1

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

tion, and nine years as a Systems Engineer at Sun Microsystems. Recently Jeff wrote the Sun BluePrint "Solaris Containers Technology Architecture Guide" and the "How to Move a Container" guide, both available at www.sun.com. He also maintains the Solaris Zones and Containers FAQ at opensolaris.org. Jeff holds a B.S. in Computer Science from Rensselaer Polytechnic Institute.



Alf Wachsmann
M4

Alf Wachsmann is working at the Stanford Linear Accelerator Center (SLAC) in the Computing Services' High-Performance Computing Group, where he is

an infrastructure designer and automation specialist. He has a doctor's degree in natural sciences obtained in Computer Science at the University of Paderborn (Germany). He worked as a post-doc in the computing center of DESY Zeuthen (Germany) before he came to SLAC in 1999.

8:45 A.M.–10:30 A.M.

Opening Remarks, Awards, Keynote

Keynote Address



Hollywood's Secret War on Your NOC

Cory Doctorow, science fiction writer, co-editor of *Boing Boing*, and former Director of European Affairs for the EFF

The entertainment industry has tried to ban every new technology from the record player to the VCR, but when it comes to the Internet and the general-purpose PC—the battleground of the war on copying—Hollywood has far grimmer plans. Under a variety of legislative, standards, policy, and treaty negotiations, the people who brought you *Police Academy n-1* are working to prohibit open source, make open ports a crime, and turn Web 2.0 into AOL 0.9b. You can fight this—you can put a stake through its heart. If you don't, kiss everything you love about the Internet goodbye.

11:00 A.M.–12:30 P.M.

REFEREED PAPERS

Electronic Mail

Privilege Messaging: An Authorization Framework over Email Infrastructure

Brent ByungHoon Kang, Gautam Singaraju, and Sumeet Jain, *University of North Carolina at Charlotte*

Securing Electronic Mail on the National Research and Academic Network of Italy

Roberto Cecchini, *INFN, Florence*; Fulvia Costa, *INFN, Padua*; Alberto D'Ambrosio, *INFN, Turin*; Domenico Diacono, *INFN, Bari*; Giacomo Fazio, *INAF, Palermo*; Antonio Forte, *INFN, Rome*; Matteo Genghini, *IASF, Bologna*; Michele Michelotto, *INFN, Padua*; Ombretta Pinazza, *INFN, Bologna*; Alessandro Spanu, *INAF, Palermo*; Alfonso Sparano, *University of Salerno*

A Forensic Analysis of a Distributed Two-Stage Web-Based Spam Distribution System

Daniel V. Klein, *LoneWolf Systems*

INVITED TALKS I

Teaching Problem Solving: You Can and You Should

Elizabeth Zwicky, *Acuitus*

Problem solving is the essence of what most system administrators do, but it's not often taught, and there's a lot of mystique that says it can't be taught. In fact, it's a skill, and it can be taught to the same extent that other skills can be taught. The most important tool in teaching it is simply a belief that it can be taught; this talk will attempt to convince you, and will provide you with more tools you can use to teach.

INVITED TALKS II

Sysadmins, Network Managers, and Wiretap Law

Alex Muentz, *Geek and Corporate Counsel, Cornerstone IT*

How does the law affect how you secure your network and the privacy of your users? CALEA, the Wiretap Act, the Stored Communications Act, and FISA all affect how you do your job—how you can protect yourself, your company, and your users from lawsuits and prosecution.

THE GURU IS IN

UNIX and Microsoft Interoperability

Joseph Radin, *Ricoh Company*

Joseph Radin is currently working at the Ricoh Company as an Engineering Manager. For the past 6 years Joseph has served as a technical advisor to a number of major FORTUNE 500 companies, defining problems and implementing solutions, many of which involved UNIX-Microsoft interoperability. Mr. Radin has authored four books on UNIX system administration, UnixWare OS, the Mosaic Internet browser, and X Windows.

**Training and Technical Sessions:
The Perfect Combination**

LISA '06 is designed to give you the optimum learning experience. To get the most out of LISA '06, we encourage you to take part in both training and technical sessions. Please note that you cannot take a full day of training and a full day of tech sessions on the same day. Do not despair, though; all is not lost. Take advantage of Registration Package G, Wednesday/Thursday Half-and-Half Tech and Training: Attend any combination of two half-days of training and two half-days of technical sessions on Wednesday and Thursday. To help you make your decisions, the complete training program schedule can be found on pp. 4–12 and the following pages have the entire Technical Sessions schedule laid out for you. Finally, learn more about Package G and our other discount registration packages on p. 29.

See www.usenix.org/lisa06/tech for complete technical program info.



2:00 P.M.–3:30 P.M.

REFEREED PAPERS

Boundaries

Firewall Analysis with Policy-based Host Classification

Robert Marmorstein and Phil Kearns, *The College of William and Mary*

Secure Mobile Code Execution Service

Lap-chung Lam, Yang Yu, and Tzi-cker Chiueh, *Rether Networks Inc.*

FLAIM: A Multi-level Anonymization Framework for Computer and Network Logs

Adam Slagell, Kiran Lakkaraju, and Katherine Luo, *National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign*

INVITED TALKS I

Site Reliability at Google/My First Year at Google

Tom Limoncelli, *Google*

Tom will speak about what it's like to be on the team that runs www.google.com's services and explore some of the technologies that enable Google's Web services to maintain their high uptime. Google's "service oriented network" (SON) enables the creation of new products that are scalable and maintainable. Tom will give a sysadmin's view of Google technologies such as GFS, MapReduce, Sawmill, and more. He will also describe how to make a policy that is "Googley."

INVITED TALKS II

Leveraging the IT Community

Patrick McGovern, *Chief Community Splunker, Splunk*

Troubleshooting servers can be a daunting task, particularly at 3:00 a.m. Leveraging the expertise and knowledge of IT professionals globally to find the solution greatly reduces the mean-time-to-resolution. This talk is focused on building a new broad resource for sysadmins by sysadmins. Starting with the concepts that made the site Wikipedia a great success and tools like grep so universal, this talk will discuss the challenges of building a large IT community/knowledge base and how to bring IT troubleshooting to the next level.

THE GURU IS IN

LDAP

Howard Chu, *Chief Architect, Symas Corp.*

Howard Chu has deep experience with system networking and security technologies. He started working with OpenLDAP in 1998 and has been one of the leading developers on the OpenLDAP core team since 1999. He is currently working on a book on OpenLDAP administration, to be released in spring 2007.

Please see
www.usenix.org/lisa06/tech
for complete technical program
information.

4:00 P.M.–5:30 P.M.

REFEREED PAPERS

Security

Administering Trusted Computing on a Linux System: Why Would I Turn Trusted Computing On?

Kylene Hall, Tom Lendacky, Emily Ratliff, and Kent Yoder, *IBM*

Centralized Security Policy Support for Virtual Machine System

Nguyen Anh Quynh, *Keio University*

A Platform for RFID Security and Privacy Administration

Melanie R. Rieback, Georgi N. Gaydadjiev, Bruno Crispo, Rutger F.H. Hofman, and Andrew S. Tannenbaum, *Vrije Universiteit Amsterdam*

INVITED TALKS I

Open Source Software and Its Role in Space Exploration

DJ Byrne, *Software Engineer, Jet Propulsion Laboratory*

Open source developers and NASA have a lot in common. Both are dedicated to expanding the pool of information floating freely through society. Both are focused on the cutting edge, creating new tools and capabilities. Open source software explores our solar system and observes the universe. For example, software on and around Mars today was built with gcc out of a CVS repository stored in AFS, using Kerberos authentication.

INVITED TALKS II

Virtualization: The Good, the Bad, the Ugly 4:00 p.m.–4:40 p.m.

Michael Baum, *Splunk*

As virtualization goes mainstream into the IT infrastructure, managers and admins must contend with the new level of system complexity it introduces into the data center. It's not possible to virtualize without adding an additional layer of software and hardware to the myriad technologies already deployed within its legacy systems. Baum will discuss the challenges of virtualization and offer troubleshooting tips.

The New Economics of Virtualization 4:40 p.m.–5:20 p.m.

Alex Vasilevsky, *Founder and CTO, Virtual Iron Software*

Virtualization holds great promise, but proprietary technologies add cost and complexity. This session looks at how virtualization makes the data center more efficient and flexible while accelerating its initiatives and improving total cost of ownership. We'll assess the virtualization landscape and discuss strengths and weaknesses of existing and new virtualization solutions.

THE GURU IS IN

Spam

Doug Hughes, *Global Crossing*

Doug Hughes takes care of the ISP and relay mail servers for an international telecommunications provider and spends far too much time figuring out how to stop the servers from being overwhelmed with spam. He talked about some of the techniques used to do so at LISA '04's Spam Mini-Symposium and also last year in a Guru session. This will be a practical discussion of what things work, what things don't, and what things might.

TECHNICAL SESSIONS

THURSDAY, DECEMBER 7

9:00 A.M.–10:30 A.M.

REFEREED PAPERS

Theory

Specification-Enhanced Policies for Automated Management of Changes in IT Systems

Chetan Shankar, *University of Illinois at Urbana-Champaign*; Vanish Talwar, Subu Iyer, Yuan Chen, and Dejan Milojević, *Hewlett-Packard Laboratories*; Roy Campbell, *University of Illinois at Urbana-Champaign*

Experience Implementing an IP Closure

Ning Wu and Alva Couch, *Tufts University*

Modeling Next Generation Configuration Management Tools

Mark Burgess, *Oslo University College*; Alva Couch, *Tufts University*

INVITED TALKS I

Everything You Know About Monitoring Is Wrong

Mazda A. Marvasti, *Integrien Corporation*

This talk will propose an alternative approach to managing complex distributed systems. Mazda will explain why inference from key metrics allows real-time understanding of the health of a distributed system in a way that sucking data from a packet-level fire hose does not. He'll explore the value of a steady stream of out-of-normal alerts, question the value of end-to-end service mapping, and explore whether virtualization is the silver bullet for coping with complexity.

INVITED TALKS II

Command and Control: System Administration at U.S. Central Command

Andrew Seely, *Global Command and Control System Lead, HQUSCENT-COM-J6/Northrop Grumman Defense Mission Systems*

This talk will serve as an introduction to the function of military Command and Control (C2) from a systems support perspective. Andy will discuss performing the sysadmin role in a military environment where systems can have a critical life-or-death function. He will also share examples of scripts and techniques used to solve problems created by the C2 systems environment. Finally, he will offer a glimpse into this unique environment's special quirks, challenges, and interesting lessons learned.

HIT THE GROUND RUNNING TRACK

Find out from the experts what you need to know to get started on the following topics:

Identity Management

Jon Finke,
Rensselaer Polytechnic Institute

AFS

Esther Filderman,
The OpenAFS Project

Build a Linux Oracle RAC Cluster

Chris Page, *Corporate Technologies, Inc.*

NFSv4

Michael Eisler, *NetApp*

SNMP

Doug Hughes, *Global Crossing*

For more info about the Hit the Ground Running track, see www.usenix.org/lisa06/htg.

11:00 A.M.–12:30 P.M.

REFEREED PAPERS

Analysis

Towards Customer-friendly Kernel Crash Analysis

Archana Ganapathi, Viji Ganapathi, and David Patterson, *University of California, Berkeley*

SEUS: A Distributed System Environment for Understanding Software Actions

Doo San Sim and V.N. Venkatakrisnan, *University of Illinois at Chicago*

ResMon: A Tool for Discovering Software Dependencies, Configuration, and Requirements in Windows

Rajiv Ramnath, Sufatrio, Roland Yap, and Wu Yongzheng, *National University of Singapore*

INVITED TALKS I

Perfect Data in an Imperfect World

Daniel V. Klein, *Consultant*

It is no secret that we are at the dawn of the digital age—our parents have computers, digital cameras, MP3 players, etc. We each have more computing power in our cell phones than the mainframes of 35 years ago, and everywhere we find data acquisition and tracking systems. Privacy has never been more zealously guarded nor more freely abandoned. This talk will take a look at what our world is becoming, and perhaps suggest what we can do to make it a little less imperfect.

INVITED TALKS II

QA and the System Administrator

Adam Haberlach, *Google*

As enterprises grow and more tools and services are provided by the System Administration Organization, there is a greater need for customer representation and independent validation of both internal and external applications. We will share with you some of the tools and techniques that we've developed in order to guarantee a quality experience and maximize the productivity of our engineers. At the very least, we'll tell you why they only notice when things don't work.

THE GURUS ARE IN

How to Get Your Paper Accepted at LISA

Tom Limoncelli, *Google*; Adam Moskowitz, *Upromise, Inc.*

Tom Limoncelli, author of O'Reilly's *The Art of Time Management for System Administrators* and co-author of *The Practice of System and Network Administration* from Addison-Wesley (second edition to be premiered at this conference), is a system administrator at Google. He received the USENIX/SAGE 2005 Outstanding Achievement award.

Adam Moskowitz, author of the SAGE Short Topics booklet *Budgeting for SysAdmins*, is a Senior System Administrator at Upromise, Inc.; he has also been a programmer, a manager of system administrators, and a certified barbecue judge. Adam has run the LISA Advanced Topics Workshop for almost 10 years, has served on many program committees, and has served as LISA Invited Talks (Co-)Chair three times.

**Early
Bird
Discount**

Register by November 10, 2006, and SAVE!
www.usenix.org/lisa2006

2:00 P.M.–3:30 P.M.

REFEREED PAPERS

Systems and Network Management

LiveOps: Systems and Security Management as a Service

Chad Verbowski, *Microsoft Research*; Juhan Lee, *Microsoft MSN*; Yi-Min Wang, *Microsoft Research*

Managing Large Networks of Virtual Machines

Kyrre Begnum, *Oslo University College*

Directing Change Using Bcfg2

Narayan Desai, Rick Bradshaw, and Cory Lueninghoener, *Argonne National Laboratory*

INVITED TALKS I

High Availability: From Luxury to Commonplace Necessity in 10 Years

Eric Hennessey, *Group Technical Product Manager, Symantec Corp.*

This session will cover the evolution of high-availability clustering, from server-centric active-passive paired systems, through larger and more sophisticated clusters, to wide-area clustering. We'll discuss the technologies that have enabled the evolution and the current state of clustering technology. We'll discuss the trend of using clustering as a service management tool, and the evolution to full data center and application management.

INVITED TALKS II

What Do You Mean, Identity 2.0?

Cat Okita, *Earthworks*

Identity management means different things to different people—everything from passwords through pgg to marketing preferences. What are the essential elements of the Identity 2.0 movement, and why should a system administrator care about any of this in the first place?

This talk will discuss the current state of Identity 2.0, starting with a brief survey of identity management from AAA to the user-centric identity model of Identity 2.0. I will then use Jon Callas's breakdown of identity management types to categorize and describe how and why the average system administrator would implement Identity 2.0.

THE GURU IS IN

VoIP

Robert Sparks, *Estacado Systems*

Robert Sparks is the VP of Research and Development at Estacado Systems, providing solutions in real-time IP communications. He is a co-author of the core SIP specification, RFC3261, and several of its extensions. He is also co-author of the book *SIP Beyond VoIP: The Next Step in the IP Communications Revolution*. He co-chairs the IETF's SIMPLE working group, is currently President and on the board of directors of the SIP Foundry, and is an active contributor to the reSIProcate project.

4:00 P.M.–5:30 P.M.

REFEREED PAPERS

Visualization

NAF: The NetSA Aggregated Flow Tool Suite

Brian Trammell, *Carnegie Mellon University*; Carrie Gates, *CA Labs, CA*

Interactive Network Management Visualization with SVG and AJAX

Athanasios Douitsis and Dimitrios Kalogeras, *National Technical University of Athens, Greece*

Bridging the Host-Network Divide: Survey, Taxonomy, and Solution

Glenn A. Fink and Vyas Duggirala, *Virginia Polytechnic Institute and State University*; Ricardo Correa, *University of Pennsylvania*; Chris North, *Virginia Polytechnic Institute and State University*

INVITED TALKS I

The Last, Best Hope: Sysadmins and DBAs as the Last Guardians of Privacy

Danny O'Brien, *Activism Co-ordinator, Electronic Frontier Foundation*

Accusations that the NSA has access to 20Tb of commercial phone data. Mooted plans by the Attorney General to introduce compulsory data retention. Meanwhile, Google has all your email, that online quiz site knows your political opinions, and MySpace knows what your children like for lunch. Danny O'Brien takes a whistle-stop tour of our privacy laws, the current status of surveillance, and how the best chance of protecting privacy in a digital age might just lie in the BOFH.

INVITED TALKS II

Is Entropy Winning? Drowning in the Data Tsunami

Lee Damon, Sr. *Computing Specialist, University of Washington*; Evan Marcus, *CTO and Founder, Aardvark Technologies, Ltd*

We're drowning under a wave of data and are oblivious to it. As data space expands we will start losing track of—and thus losing—our data. Archival backups add complexity to this already confusing situation. Then we toss in security and availability issues for some spice. Where is this going, and how can we handle it in the face of millions of gigabytes of "old cruft"?

THE GURU IS IN

Time Management for System Administrators

Tom Limoncelli, *Google*

Tom Limoncelli, author of O'Reilly's *The Art of Time Management for System Administrators* and co-author of *The Practice of System and Network Administration* from Addison-Wesley (second edition to be premiered at this conference), is a system administrator at Google. He received the USENIX/SAGE 2005 Outstanding Achievement award.

Please see
www.usenix.org/lisa06/tech
for complete technical program
information.

9:00 A.M.–10:30 A.M.

NETWORK SECURITY TRACK

Black Ops 2006: Pattern Recognition

Dan Kaminsky, *DoxPara Research*

The “Black Ops” series of talks tend to look for useful functionality in existing systems, and this year’s edition is no exception. Topics will include:

- Detecting selective degradation along network paths
- Results from a worldwide SSL scan
- Cryptomnemonics
- A midpoint between dumb fuzzing and smart fuzzing
- Dotplots as a guide for fuzzing
- Visual Bindiff

INVITED TALKS II

Seriously, Tape-Only Backup Systems Are Dead

W. Curtis Preston, *Glasshouse*

If you’re performing LAN-based backups directly to today’s tape drives, you’re doing nothing but shooting yourself in the foot. The good news is that a number of vendors have worked very hard on disk-based solutions that solve all these problems. This talk will sift through your options while offering many stories of real people who have actually made their backup system faster and more reliable by using one or more these disk-based options.

THE GURUS ARE IN

Virtualization and the Virtual Infrastructure

John Arrasjid, John Gannon, and Andy Knosp, *VMware*

John Arrasjid has 20 years’ experience in the computer science field. He is currently a senior member of the VMware Professional Services Organization as a Consulting Architect. John has developed a number of service offerings focused on performance management, security, and disaster recovery and backup.

John Gannon has over ten years of experience architecting and implementing UNIX, Linux, and Windows infrastructures. John is currently responsible for delivering server consolidation, disaster recovery, and virtual infrastructure solutions to VMware’s FORTUNE 500 clients.

Andy Knosp has over ten years of experience in corporate IT and professional services. Andy is currently Director of Professional Services at VMware and manages a team of technical professionals responsible for delivering server consolidation, disaster recovery, and virtual infrastructure solutions to VMware’s FORTUNE 500 clients.

11:00 A.M.–12:30 P.M.

REFEREED PAPERS

Potpourri

The NMI Build & Test Laboratory: Continuous Integration Framework for Distributed Computing Software

Andrew Pavlo, Peter Couvares, Rebekah Gietzel, Anatoly Karp, Ian D. Alderman, and Miron Livny, *University of Wisconsin, Madison*; Charles Bacon, *Argonne National Laboratory*

Unifying Unified Voice Messaging

Jon Finke, *Rensselaer Polytechnic Institute*

Trackle: A Tracking and Training Tool

Daniel S. Crosta, Matthew J. Singleton, and Benjamin A. Kuperman, *Swarthmore College*

NETWORK SECURITY TRACK

Zombies and Botnets: Attacks on Messaging Security by Organized Criminal Enterprises

Dmitri Alperovitch, *Research Scientist, CipherTrust Inc.*

Today millions of zombies—innocent home and business computers that have been taken over by highly organized, interconnected criminal groups—are the biggest IT threat to organizations and individuals. Dmitri Alperovitch sees firsthand billions of global messages per month and will provide a view into zombie networks, an analysis of attacker methods and techniques, an overview of phishing and how phishing attacks propagate, and what organizations can do to protect themselves.

INVITED TALKS II

Power-Managed Storage: Longer Data Life and Lower Energy Consumption

Aloke Guha, *COPAN Systems*

With escalating energy costs and growing power consumption, the utility bills at many enterprise datacenters now exceed hardware acquisition costs. This talk will discuss the reliability of high-capacity disk storage systems that are being increasingly used to archive persistent data over long time periods. We will cover how long-term data repositories using Massive Array of Idle Disk (MAID) technologies that power-manage drives can reduce the failure rates.

HIT THE GROUND RUNNING TRACK

Find out from the experts what you need to know to get started on the following topics:

Bad Interview Questions

Adam Moskowitz, *Upromise, Inc.*

Spam

John “Rowan” Littell, *California College of the Arts*

Mac OS X

Tom Limoncelli, *Google*

bcfg2

Narayan Desai, *Argonne National Laboratory*

Puppet

Luke Kanies, *Reductive Labs*

For more info about the Hit the Ground Running track, see www.usenix.org/lisa06/htg.

Don’t miss a special lunchtime talk by Alva Couch: see p. 23.

Early
Bird
Discount

Register by November 10, 2006, and SAVE!
www.usenix.org/lisa2006

2:00 P.M.–3:30 P.M.

WORK-IN-PROGRESS REPORTS (WIPS)

A Work-in-Progress Report (WiP) is a very short presentation about work you are currently undertaking. 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 your short report, send email to lisa06wips@usenix.org or sign up at LISA '06.

NETWORK SECURITY TRACK

Corporate Security: A Hacker Perspective

Mark “Simple Nomad” Loveless, *Security Architect, Vernier Networks, Inc.*

Hackers typically have a flavor of the month when it comes to getting in. This talk will walk you through what hackers are truly looking to achieve—their holy grail—and what avenues they are currently looking to exploit to find it. The talk will be frank and to the point, based upon personal interactions and experiences. Expect an extremely lively, educational, controversial, and entertaining talk.

INVITED TALKS II

System Administration: Drowning in Management Complexity

Chad Verbowski, *Software Architect, Microsoft Research*

Yearly increases in the variation, complexity, and volume of systems management tasks are outpacing our ability to hire qualified administrators to maintain our IT environments. This talk presents a new black-box approach for reducing the complexity of systems and security management faced by administrators. The goal is to show this as a scalable alternative compared with current signature and declarative management approaches.

THE GURU IS IN

Backups

W. Curtis Preston, *Glasshouse*

W. Curtis Preston is well known to LISA audiences, having spoken at several LISAs over the years. He's been a data protection specialist for 13 years, and is known to his friends as “Mr. Backup.” He's the author of the O'Reilly books *Backup & Recovery* and *Using SANs and NAS*, and has hundreds of articles to his credit as well.

Please see
www.usenix.org/lisa06/tech
for complete technical program
information.

4:00 P.M.–5:30 P.M.

Closing Session

Improv for Sysadmins

Bob Apthorpe, *St. Edward's University*; **Dan Klein**, *Consultant*

Have you ever seen “Whose Line Is It Anyway?” and marveled at the actors? Although it may not be obvious, improvisors and sysadmins have a lot in common! We both have to think on our feet, often “winging it,” and both groups actively practice ad hoc problem-solving. Management calls it “thinking outside of the box,” and we say “welcome to our world.”

From the outside, good improv looks like a lot of fun (it is!), and good system administration looks easy and fun (why else do we have toys in our cubes?). Both groups have fun because they both create environments to bring people together and make good things happen. At its core, improvisation is not about being funny so much as it is about carefully listening, clearly expressing oneself, and confidently making decisions and taking action. So is system administration. Our goal is to get paid to play.

This session will relate improvisational acting concepts to system administration. Improv can show us how our responses to others can be misinterpreted and, more important, how to change that by producing a constructive dialogue. Understanding your audience and their context can make everything move much more smoothly! Other topics will include the role body language plays in communication, especially in the communication of status, and the importance of observation and attention to detail, with an emphasis on “active listening,” saying “yes, and . . .,” and other observation/communication techniques.

The session concludes with a question-and-answer period and additional improv demonstrations as time permits. We won't try to be funny, but we know that you'll enjoy learning some incredibly valuable improvisational techniques.

LUNCHTIME TALK

FRIDAY, 1:00 P.M.–1:45 P.M.

The Future of System Administration: How to Stop Worrying and Learn to Love Self-Managing Systems

Alva L. Couch, *Associate Professor of Computer Science, Tufts University*

The profession of system administration is currently threatened by many forces, including self-managing products, a lack of upward mobility paths, and a growing trend toward outsourcing. I explore how ongoing changes in the systems we manage can drive positive changes in the profession. We must learn to interact with the systems we manage at a very different level than we are currently trained to do.

WORKSHOP SERIES

See www.usenix.org/lisa06/workshops for the complete schedule.

JOIN YOUR PEERS FOR THREE DAYS OF FOCUSED DISCUSSION

- Senior system administrators will want to participate in one or more of these all-day workshops. Attendance is limited for each workshop, which ensures a seminar-like atmosphere.
- Please note that these workshops are full-day sessions. Attending a workshop precludes attending training sessions on that day.
- To attend a workshop, you must be a registered conference attendee as well as an accepted workshop participant. See the individual descriptions for information on how to apply to attend a workshop. Accepted applications will be confirmed by the workshop coordinator.
- There is an additional fee of \$150 to attend a workshop, payable on-site only; this fee includes lunch on the day of the workshop. See the box below for details about how to register.



SCHEDULE AS OF AUGUST 31, 2006

For the complete schedule of workshops, see www.usenix.org/lisa06/workshops.

Monday, December 4

Configuration Management Workshop

Paul Anderson, *University of Edinburgh*
9:00 a.m.–5:00 p.m.

Specifying the required configurations for large numbers of interconnected machines and automatically installing those configurations to provide an overall service has been an important topic since the very early LISA conferences. Automatic tools are essential for anyone who wants to manage more than a few machines efficiently and to have confidence in their correctness and security.

This workshop follows on from previous years, with the intention of discussing the fundamental problems of current approaches to system configuration and looking at the requirements and possible solutions for the next generation of configuration languages and tools. This year's workshop will include a number of sessions targeted at automatic validation of configurations. More details, together with information on previous workshops and a mailing list, are available at <http://homepages.informatics.ed.ac.uk/group/lssconf>.

The workshop will be a mixture of short presentations and informal discussions; participation is welcome, both from those with experience in the field and from those looking for configuration solutions. However, active participation will be expected. For an invitation, send a short email to lisa06confwshop@usenix.org. Please include a brief description of your areas of interest/experience, and indicate whether you would be prepared to make a short presentation.

Managing Sysadmins Workshop

Tom Limoncelli, *Google*;
Cat Okita, *Independent Consultant*
9:00 a.m.–5:00 p.m.

This one-day workshop, intended for system administrators taking on management roles and managers of system administrators, provides an informal roundtable discussion of problems facing managers today. Attendees will take turns introducing issues they are experiencing, and the group will share their experiences with similar situations and discuss options and solutions. Attendees should manage (or act as team lead to) two or more system administrators. The workshop will be facilitated by Cat Okita, independent consultant, and Tom Limoncelli, author of *Time Management for System Administrators* and co-author of *The Practice of System and Network Administration*. To attend the workshop, send email to lisa06manwshop@usenix.org.

Tuesday, December 5

Advanced Topics Workshop

Adam Moskowitz, *Upromise, Inc.*
9:00 a.m.–5:00 p.m.

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/atw06>; position papers should be sent to lisa06atw@usenix.org. Attendees are required to bring a laptop computer.

WORKSHOP REGISTRATION IS ON-SITE ONLY

How It Works: When you arrive at LISA '06, collect your technical sessions registration materials, then proceed to the Workshop Registration Desk. Acceptable forms of payment are Visa, MasterCard, American Express, Discover, cash, and check.

Questions? Contact lisa06_reg@usenix.org.

REGISTRATION HOURS:

Saturday, December 2, 5:00 p.m.–8:00 p.m.

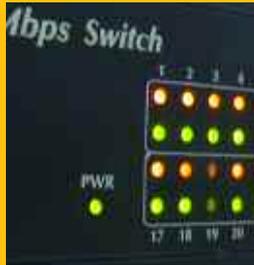
Sunday, December 3, 7:30 a.m.–5:00 p.m.

Monday, December 4, 7:30 a.m.–5:00 p.m.

Tuesday, December 5, 7:30 a.m.–5:00 p.m.

Morning workshop registration lines may be long. Please try to register in the afternoon or evening before your workshop, to ensure that you get to your workshop on time.

SEE WHAT'S NEW AT THE . . .



VENDOR EXHIBITION

SEE WHAT'S NEW AT THE LISA '06 VENDOR EXHIBITION

**Wednesday, December 6,
noon–7:00 p.m.**

**Thursday, December 7,
10:00 a.m.–2:00 p.m.**

EVERYONE IS WELCOME!

The exhibition is open to the public.
Register for a free pass at
www.usenix.org/lisa06/exhibition.

VENDOR EXHIBITION

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.

EXHIBITORS AS OF AUGUST 31, 2006

Advanced Computer &
Network Corporation
Avocent
Bakbone Software
BlueArc Corporation
*BSD Projects
Carlo Gavazzi Computer Solutions
Cambridge Computer Services, Inc.
EAGLE Software, Inc.
e-DMZ Security
Google
GroundWork Open Source Solutions,
Inc.
Lantronix
MRV
Net Optics
The OpenNMS Group, Inc.
PostgreSQL
Raritan
Server Technology
Splunk
The Written Word

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

LISA '06 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/lisa06/sponsors for details or contact Cat Allman, USENIX Sales Director: (510) 528-8649 x32 or sponsorship@usenix.org.

**“I got lots of great
information and learned about
some great solutions.”**

a LISA attendee

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 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 a dedicated system administration section 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 technical sessions registration. The benefits of this membership include:

- Free subscription to *login.*, the highly regarded bi-monthly magazine of USENIX, both in print and online
- Online access to all conference Proceedings from 1993 to the present
- 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 *Sys Admin*, *Linux Journal*, 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.

To that end, we are constantly creating new programs. In the fall the new SAGE Web site will debut, including the SAGE Programs Blog, enhanced Jobs and Speakers areas, an updated Bookshelf, and SysAdmin Toolbox 1.0. Visit the membership booth at LISA and find out about the latest developments.

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

- Discount on registration for LISA, the annual Large Installation System Administration Conference
- The latest Short Topics in System Administration booklet for every member and access to the Short Topics online library—14 volumes and growing!
- The option to join sage-members, an electronic mailing list for peer discussion and advice, and access to the sage-members list archives
- Immediate access to the results of the SAGE Salary Survey
- Access to job postings, including real-time email notification of new jobs posted and the ability to post resumes
- Discounts on publications such as *Sys Admin* magazine

THANKS TO OUR SUPPORTING MEMBERS & SPONSORS

USENIX & SAGE DUAL SUPPORTING MEMBERS

Ajava Systems, Inc.	Splunk
Microsoft Research	Taos
Raytheon	Tellme Networks

USENIX SUPPORTING MEMBERS

Addison-Wesley Professional/ Prentice Hall Professional	Intel
Ajava Systems, Inc.	Interhack
AMD	Microsoft Research
Cambridge Computer Services, Inc.	NetApp
EAGLE Software, Inc.	Oracle
Electronic Frontier Foundation	OSDL
Eli Research	Raytheon
GroundWork Open Source Solutions	Ripe NCC
Hewlett-Packard	Sendmail, Inc.
IBM	Splunk
Infosys	Sun Microsystems, Inc.
	Taos
	Tellme Networks
	UUNET Technologies, Inc.

SAGE SUPPORTING MEMBERS

Ajava Systems, Inc.	MSB Associates
FOTO SEARCH Stock Footage and Stock Photography	Raytheon
Microsoft Research	Splunk
	Taos
	Tellme Networks

LISA '06 SPONSORS AS OF AUGUST 31, 2006

Cambridge Computer Services, Inc.	Microsoft Research
Google	Splunk

LISA '06 MEDIA SPONSORS

ACM <i>Queue</i>	<i>Linux Journal</i>
Addison-Wesley Professional/ Prentice Hall Professional	<i>Linux Pro Magazine</i>
<i>Dr. Dobb's Journal</i>	No Starch Press
<i>GRIDtoday</i>	OSTG
<i>HPCwire</i>	SNIA
IDG World Expo	StorageNetworking.org
<i>IEEE Security and Privacy</i>	<i>Sys Admin</i>
ITtoolbox	UserFriendly.org

ACTIVITIES/SERVICES/INFO FOR STUDENTS

ACTIVITIES

To enhance your LISA conference experience, attendee events are planned throughout the week. Attend the very popular Birds-of-a-Feather sessions (BoFs). Mingle with your peers and technological luminaries during the receptions.

See the LISA '06 Web site, www.usenix.org/lisa2006, for the latest additions to the activities schedule.

Welcome Get-Together

Saturday, December 2, 6:00 p.m.–8:00 p.m.

Start the conference out right: mingle with your fellow attendees over drinks and snacks at the Welcome Get-Together.

Conference Orientation

Saturday, December 2, 8:00 p.m.–9:00 p.m.

Whether this is your first time at LISA or your twentieth, stop by the Conference Orientation to learn how to get the most out of the conference. The orientation includes an overview of Washington, D.C., an introduction to LISA, and an opportunity to meet your peers.

Exhibition Reception

Wednesday, December 6, 5:30 p.m.–6:30 p.m.

Join us at the Vendor Exhibition for snacks and drinks, and take the opportunity to learn about the latest products and technologies.

Conference Reception

Thursday, December 7, 6:00 p.m.–8:00 p.m.

Join us at the Conference Reception for beer, wine, snacks, 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, December 4, 7:00 p.m.–11:00 p.m.

Tuesday, December 5, 7:00 p.m.–11:00 p.m.

Wednesday, December 6, 7:00 p.m.–11:00 p.m.

Thursday, December 7, 8:00 p.m.–11:00 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.

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

Work-in-Progress Reports (WiPs)

Friday, December 8, 2:00 p.m.–3:30 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 lisa06wips@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 '06 via an open, unsecured 802.11b Wi-Fi network. Those not wishing to use wireless can plug in and charge up in the Terminal Room. No laptop? No problem. The Terminal Room will offer a few *NIX terminals with a Web browser and your favorite shell. See <http://www.usenix.org/termroom> for more information.

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 of the Proceedings and the CD-ROM 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 email the Conference Department, conference@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 photocopy of your current student I.D. card, within 14 days from the date you make your reservation, or your reservation will be canceled. This special fee is nontransferable.

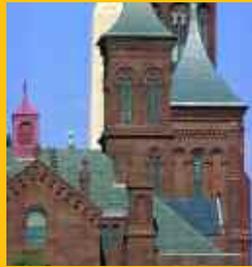
Technical Sessions

Full-time students may attend technical sessions for only \$110 per day. Students who are not members of USENIX: \$40 will be added to your technical sessions fee. Students who are not members of SAGE: \$25 will be added to your technical sessions fee. 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. Sorry, faxes will not be accepted for student grant applications.

HOTEL & TRAVEL INFORMATION



WASHINGTON, D.C.

Wardman Park Marriott Hotel

2660 Woodley Road, NW
Washington, D.C. 20008
Telephone: (202) 328-2000
Toll-free: (800) 228-9290

Hotel Reservation Discount Deadline: Friday, November 10, 2006

USENIX has negotiated special rates for conference attendees at the Wardman Park Marriott Hotel. 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.

Special Attendee Room Rates:

\$185 single, \$205 double, \$225 triple, and \$245 quad, plus tax (currently 14.5%)

Note: When the rooms in the USENIX block are sold out, requests will be handled on a space-available basis at the hotel's standard rate. Make your reservations early!

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.

AIRPORTS & GROUND TRANSPORTATION

The hotel is located near three major airports: Reagan National Airport (DCA) is located 9 miles from the hotel; Dulles International Airport (IAD) is 25 miles away; and Baltimore Washington International is 33 miles away. All three airports offer taxi service (ranging from \$18 to \$60 one-way), Super Shuttle service (ranging from \$12 to \$30 one-way; call 1-800-BLUEVAN), and public transportation options (see www.wmata.com). The hotel is located one block from the Woodley Park-Zoo/Adam's Morgan Red Line Metro Station. Self-parking is available at the hotel for \$11 per hour or \$23 daily. Valet parking is available for \$28 daily. See www.usenix.org/lisa06/hotel for more information.

TRAVELING TO LISA '06 FROM OUTSIDE THE U.S.A.?

See detailed advice from the National Academies about visiting the United States at www7.nationalacademies.org/visas/Traveling_to_US.html.

ABOUT WASHINGTON, D.C.

USENIX and SAGE are pleased to bring LISA to Washington, D.C., and the Wardman Park Marriott Hotel. The nation's capital offers a lively cultural scene, a wide array of restaurants to suit every taste and budget, and myriad museums and monuments. There are many attractions that will be of interest to LISA attendees, from the National Air and Space Museum to the International Spy Museum. See www.washington.org for more information about Washington, D.C.

Questions?

USENIX Conference Department

2560 Ninth Street, Suite 215
Berkeley, CA 94710 USA
Phone: (510) 528-8649
Fax: (510) 548-5738
Email: lisa06_reg@usenix.org

REGISTRATION INFORMATION & FEES

Register or make a reservation on the Web today at <http://www.usenix.org/lisa06/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: November 10, 2006

TRAINING PROGRAM REGISTRATION

Every LISA '06 training program registration includes:

- Admission to the tutorials you select
- Lunch on the day of your tutorials
- Training program CD-ROM, including all available tutorial presentations and materials
- Printed tutorial materials for your courses
- 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
- One-year subscription to *Sys Admin* magazine (a \$39 value)*

TECHNICAL SESSIONS REGISTRATION

Every LISA '06 technical sessions registration includes:

- Admission to all technical sessions on the days of your choice
- Copy of the Conference Proceedings (in print or on CD-ROM)
- 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
- One-year subscription to *Sys Admin* magazine (a \$39 value)*

*Offer open only to U.S. residents. This is not an additional expense, and subtraction from conference prices listed is not permissible.

Multiple Employee Discount

We offer discounts for organizations sending 5 or more employees to LISA '06. Please email lisa06_reg@usenix.org for more details.

The group discount cannot be used in conjunction with any other discounts, and it cannot be applied retroactively—that is, refunds will not be issued to those meeting the discount requirement after they have already registered.

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 this 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 and SAGE are pleased to offer Early Bird Registration Discounts of up to \$300 to those who register for LISA '06 by November 10, 2006. After November 10, registration fees increase.

Daily Rates	Before Nov. 10	After Nov. 10
1 day of technical sessions	\$270	\$320
1 day of training	\$625	\$675
1 half-day of training; second half-day only \$300	\$325	\$375

SAVE! Choose One of Our Special Discount Packages	Before Nov. 10	After Nov. 10
A. 3 Days of Technical Sessions SAVE \$100!	\$710	\$860
B. 2 Days of Training SAVE \$50!	\$1200	\$1300
C. 3 Days of Training SAVE \$100!	\$1775	\$1925
D. 4 Days of Training SAVE \$200!	\$2300	\$2500
E. 5 Days of Training SAVE \$300!	\$2825	\$3075
F. 6 Days of Training SAVE \$600!	\$3150	\$3450
G. Wednesday/Thursday Half-and-Half Tech and Training*	\$895	\$995

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

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

If you are a member of USENIX but *not* of SAGE, \$40 will be added to your technical sessions fees.

If you are a member of SAGE but *not* of USENIX, \$115 will be added your technical sessions fees.

If you are *not* a member of USENIX, SAGE, EurOpen.SE, NUUG, or SAGE-AU, \$155 will be added to your technical sessions fees.

Optional Costs

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

Workshop Fees

\$150 per day, payable on-site only. See p. 24 details.

Registration Fees for Full-Time Students

USENIX and SAGE offer full-time students special low registration fees for LISA '06 that are available at any time. See p. 27 for details.

Daily Rates for Full-Time Students	
1 day of technical sessions	\$110
1 day of training A limited number of tutorial seats are reserved for full-time students at this very special rate. Students must reserve their tutorial seats before registering. If you plan to take half-day tutorials, you must take both half-days to qualify for the student rate.	\$200

Students who are not members of USENIX: \$40 will be added to your technical sessions fee. Students who are not members of SAGE: \$25 will be added to your technical sessions fee.

Refund/cancellation date: Wednesday, November 22, 2006

All refund requests must be emailed to lisa06_reg@usenix.org by Wednesday, November 22, 2006. You may substitute another in your place.

THANKS TO OUR SPONSORS

Cambridge Computer Services, Inc.

Google

Microsoft Research

Splunk

LISA '06 offers the most
in-depth, real-worlds
system administration
training available

THANKS TO OUR MEDIA SPONSORS

ACM Queue

Addison-Wesley Professional/
Prentice Hall Professional

Dr. Dobb's Journal

GRIDtoday

HPCwire

IDG World Expo

IEEE Security and Privacy

ITtoolbox

Linux Journal

Linux Pro Magazine

No Starch Press

OSTG

SNIA

StorageNetworking.org

Sys Admin

UserFriendly.org

LISA '06

20TH LARGE INSTALLATION
SYSTEM ADMINISTRATION CONFERENCE

A **Blueprint** for Real World
System Administration

DECEMBER 3-8, 2006 | WASHINGTON, D.C.

USENIX

USENIX ASSOCIATION
2560 Ninth Street, Suite 215
Berkeley, CA 94710
510.528.8649
510.548.5738 fax

NON-PROFIT
ORGANIZATION
US POSTAGE

P A I D

PERMIT #110
HOPKINS, MN

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

Register by November 10 and SAVE!

www.usenix.org/lisa2006