LISA '97
OCTOBER 26–31, 1997

October 26–31, 1997
Town & Country Hotel
San Diego, California

Register by Sept. 19 and save $100

11th Systems Administration Conference

The Only Conference by and for System Administrators

15 Reasons to Attend LISA '97

1. 42 **tutorials** with immediately useful information. **Topics include:** *tools, security, Web, intranets and internets, networking, Sendmail, Perl, legal issues, professional development.* See pages 4-16.
2. 23 **refereed papers** with the latest research
3. **Work-in-Progress Reports (WIPS)** where you can share a cool idea that's not quite ready to be published
4. The **Vendor Exhibition** will have the newest tools and products
5. **Internet access** until 2:00am
6. **Free CD ROM** of submitted tutorial notes, refereed papers and invited talks for tutorial attendees
7. A **USENIX guru** can answer that technical question you've always wanted to ask.
8. **Conference Proceedings** and Invited Talks Notes are included with the Technical Sessions fees.
9. **Meet your peers** and share solutions.
10. **You'll bring back ideas** you can implement immediately on the job.
11. You **can hold a BOF** (Birds-of-a-Feather) session on any topic you like.
12. **The Advanced Topics Workshop** (see page 19)
13. **Poster Session** (see page 3)
14. **The free conference tee shirt**
15. **San Diego**

SAGE THE SYSTEM ADMINISTRATORS GUILD

USENIX, the Advanced Computing Systems Association

11th Systems Administration Conference

Sponsored by USENIX and SAGE

USENIX SAGE THE SYSTEM ADMINISTRATORS GUILD

Dear System Administrator:

Technology is advancing, the systems administration profession is changing, and you have to master new skills to keep apace. At the 11th LISA Conference, you can join the community of system administrators while attending a program that brings you the latest tools and techniques as well as information about the business of systems administration.

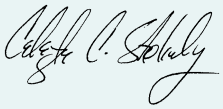
You will get lessons from the front lines on how to deal with the problems you face every day. You can learn from tutorials, peer-reviewed papers, case studies, invited talks, Guru-Is-In, and Birds-of-a-Feather Sessions. A Work-In-Progress Session will present the very latest solutions being developed. The Vendor Exhibits will include many products that the vendors hope will allow you to work more efficiently. You can give them your feedback. If you are very experienced, you may want to attend the Advanced Topics Workshop on Tuesday. And don't forget the Poster Session on Thursday evening.

The tutorial program has been expanded to 42 tutorials with 22 new topics, including Windows NT administration, managing support staff, firewall management, configuring Sendmail, network security profiles, and more. We've also brought back some of our most popular speakers including Eric Allman, Tom Christiansen, Tina Darmohray, Dan Geer, Trent Hein, Evi Nemeth, Marcus Ranum and Hal Stern. You can customize the tutorial program to suit your needs.

Please join us in San Diego from October 26-31. We look forward to seeing you there.

For the LISA program committee,

Hal Pomeranz, *Deer Run Associates*
Program Co-Chair



Celeste Stokely, *Stokely Consulting*
Program Co-Chair

PS: Don't forget to sign up for tutorials. Classes are limited and do fill early!

Conference Organizers

Program Committee

Program Co-Chairs
Hal Pomeranz, *Deer Run Associates*
Celeste Stokely, *Stokely Consulting*

Program Committee
Paul Anderson, *University of Edinburgh*
Melissa Binde, *Swarthmore College*
Helen E. Harrison, *SAS Institute, Inc.*
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Amy Kreiling, *SAS Institute, Inc.*
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Guru-Is-In Coordinator
Lee Damon, *Qualcomm*

Work-In-Progress Coordinator
Dinah McNutt, *IT Masters, Inc.*

Advanced Topics Workshop
Adam Moskowitz, *Genome Therapeutics Corp.*

Poster Session
John Posey, *Paranet*

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Important Dates to Remember:

Hotel Discount Deadline: ***Friday, October 3, 1997***

Pre-Registration Deadline: ***Friday, September 19, 1997***

Program at-a-Glance

Saturday, October 25

On-Site Registration	5:00 pm – 9:00 pm
Welcome Reception	6:00 pm – 9:00 pm
Conference Kickoff	8:00 pm – 9:00 pm

Sunday, October 26

On-Site Registration	7:30 am – 5:00 pm
Tutorial Program	9:00 am – 5:00 pm

Monday, October 27

On-Site Registration	7:30 am – 5:00 pm
Tutorial Program	9:00 am – 5:00 pm

Tuesday, October 28

On-Site Registration	7:30 am – 5:00 pm
Tutorial Program	9:00 am – 5:00 pm
Advanced Topics Workshop	9:00 am – 5:00 pm
Birds-of-a-Feather Sessions	6:00 pm – 10:00 pm

Wednesday, October 29

On-Site Registration	7:30 am – 6:00 pm
Refereed Track	9:00 am – 5:30 pm
Invited Talks Track	11:00 am – 5:30 pm
Birds-of-a-Feather Sessions	9:00 pm – 11:00 pm
Vendor Exhibition	12:00 pm – 7:00 pm
Vendor Reception	5:00 pm – 7:00 pm
Reception	7:00 pm – 9:00 pm

Thursday, October 30

On-Site Registration	7:30 am – 5:00 pm
Refereed Track	9:00 am – 5:00 pm
Invited Talks Track	9:00 am – 5:30 pm
Vendor Exhibition	10:00 am – 4:00 pm
Costume Party & Reception	6:00 pm – 8:00 pm
Birds-of-a-Feather Sessions	7:00 pm – 11:00 pm
Poster Sessions	7:00 pm – 9:00 pm

Friday, October 31

Refereed Track	9:00 am – 12:30 pm
Invited Talks Track	9:00 am – 12:30 pm
Joint Sessions	2:00 pm – 5:30 pm

Poster Session

Thursday, October 30, 7:00 pm–9:00 pm

Submissions Due: ***September 2, 1997***

Poster submissions provide an opportunity to present interesting results, including preliminary results, with less time and effort than are typically needed for a paper. A poster is an ideal medium for material such as tips and techniques that is best presented to small groups. Posters provide conference attendees the opportunity to interact individually with the presenters.

The conference will provide display space of approximately 3 feet wide by 4 feet high on which to display the poster.

What and Where to Submit

Prospective poster presenters should submit an abstract of their presentations (at most 1000 words), via email to *lisa97poster@usenix.org* by September 2, 1997. Abstracts should include complete author information, including affiliation and email addresses, as well as the name(s) of presenting author(s). You may also submit proposals by one of the following alternate methods:

- Fax to 972.390.1114
- Postal mail to:
  John Posey
  1201 Thoreau Lane
  Allen, TX 75002-2069

Participants are strongly encouraged to include references to URLs that contain more detailed information, both about the proposed presentation and related work of others.

Abstracts of accepted posters will be published in the Invited Talks Submitted Notes which are distributed to all conference attendees. Please email questions to *lisa97poster@usenix.org*.

Tutorial Program *Sunday–Thursday, October 26–28, 1997*

USENIX has expanded its tutorial program to deliver the critical information you need. Delivered by experts, tutorials are intensive, practical, and essential to your professional development.

Sign up for tutorials and you'll get an immediate payoff by gaining command of the newest developments and putting them to work in your organizations.

Register now to guarantee your first choice—seating is limited.

Tutorial fees include:

- **Printed and bound materials from the tutorials you have selected**
- **CD-ROM–including tutorials and conference proceedings**
- **Lunch**
- **Admission to the Vendor Exhibition**

Tutorial Program at-a-Glance

Sunday, October 26	**S1** System and Network Performance Tuning ❁ ❐	**S2** Introduction to Perl 5 for UNIX Programmers ▲	**S3** Internet Security for System and Network Administrators ✪	**S4** Setting Up and Administering a Web Server ❁ ◐	**S5** NIS+ ❁	**S6** ISP Systems Administration New ❁ ❐	**S7** Introduction to UNIX Administration New ❁	**S8AM** Security Policies & Practices New ✪	**S10AM** Linux Systems Administration, or Everyone Can Be Root New ❁
								S9PM Skills for Consultants New ■	**S11PM** Handling Computer and Network Security Incidents New ✪
Monday, October 27	**M1** Hot Topics in Modern System Administration New ❁	**M2** Fault Tolerance, High Availability, and Network Design in Today's Client-Server Environments New ❁ ❐	**M3** Topics in Solaris Systems Administration ❁	**M4** Sendmail Inside and Out (Updated for Sendmail 8.8) ✉	**M5** Security on the World Wide Web ✪ ◐	**M6** Security for Software Developers: How to Design Code that Withstands Hostile Environments ▲ ✪	**M7** Firewall Management and Troubleshooting New ✪	**M8** Administration of a Local IP Network ❐	**M9AM** Administering Windows NT 4.0 New ❁
									M10PM Advanced Heterogeneous Systems Management—UNIX and Windows NT New ❁
Tuesday, October 28	**T1** Classic Topics in Systems Administration ❁ ❐	**T2** CGI and WWW Programming in Perl ▲ ◐	**T3** Advanced Topics in DNS and BIND New ❐	**T4** IP version 6: An Introduction ❐	**T5** Network Security Profiles: What Every Hacker Already Knows About You, and What To Do About It New ✪	**T6** Joining the Internet Safely Using Firewalls ✪	**T7** Building a Successful Security Infrastructure New ✪	**T8AM** Configuring Sendmail Using the M4 Macros New ✉	**T10AM** Good Ideas: Presenting Technical Information New ■
								T9PM Building Secure Intranets New ✪ ❐	**T11PM** Writing Good Stuff: A Practical Guide for Technical Content ■

If you are interested in CEU credits, see page 26.

LISA lets me keep abreast on what's going on in the industry. The more technical knowledge I can get, the better I can serve my client—and the LISA conference is an intensive but fun way to get a lot of useful knowledge.

Josh Simon, *Paranet, Inc.*

S12AM Getting What You Want: Translating Technical Ideas into Funding New ■		
S13PM Basics of Domain Name System (DNS) Administration ❒		
M11AM Talking Technical—Breaking the Communication Barrier ■	**M13AM** Managing Support Staff New ■	**M15AM** Sendmail from the Trenches ✉
M12PM Effective Meetings: Get More Done in Less Time ■	**M14PM** Developing Computing Policies New ✪	
T12AM Introduction to NNTP and INN ☸ ❒	**T14AM** TCP/IP Troubleshooting with UNIX ❒	**T16AM** Where Your Employer's Liability Stops and Yours Begins New ■
T13PM Advanced Topics in NNTP and INN ☸ ❒	**T15PM** Managing Network Printers and Print Spoolers ☸ ❒	**T17PM** The Right of Privacy and the Employer/Employee Relationship New ■

Tutorial Program *Sunday–Tuesday, October 26–28, 1997*

Sunday, October 26

S1 System and Network Performance Tuning ☸ ❒

Hal Stern, *Sun Microsystems*

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

What you will learn: Procedures and techniques for tuning systems, networks and application code.

Starting from the single system view, we will examine how the virtual memory system, the I/O system and file system can be measured and optimized. We'll extend the single-host view to include Network File System tuning and performance strategies.

Detailed treatment of networking performance problems, including network design and media choices, will lead to examples of network capacity planning. Application issues, such as system call optimization, memory usage and monitoring, code profiling, real-time programming, and techniques for controlling response time will be addressed. Many examples will be given, along with guidelines for capacity planning and customized monitoring based of your workloads and traffic patterns. Question and analysis periods for particular situations will be provided.

Topics include:

- **Performance tuning strategies** (practical goals, monitoring intervals, useful stats, tools)
- **Server tuning** (file system and disk tuning, memory consumption, and swap space, systems resource monitoring)
- **NFS performance tuning** (server constraints, client improvements, NFS over WANs, automounter, and other tricks)
- **Network performance, design, and capacity planning** (locating bottlenecks, demand management, media choices and protocols, network topologies, throughput and latency considerations, and modeling resource usage)
- **Application tuning** (system resource usage, memory allocation, code profiling, job scheduling and queuing, real-time issues, and managing response time)

S2 Introduction to Perl 5 for UNIX Programmers ▲

Tom Christiansen, *Consultant*

Who should attend: System administrators who have never looked at Perl before or those programming in it for a short time. You must have experience in UNIX shell programming with a good working knowledge of regular expressions. A background in *sed*, *awk*, and/or C programming will prove useful.

What you will learn: Perl syntax and semantics; how to read Perl and learn from others' progamming experiences.

Have you been spending a lot of time trying to solve problems in the shell or C? Perl is an extremely powerful and robust scripting language that can help you solve problems in less time. Now ten years old, Perl is the tool of choice because of its power; plus it works on nearly every conceivable platform. Because it incorporates aspects of more than a dozen well-known UNIX tools, experienced UNIX users will come up to speed on Perl rapidly, and even programmers inexperienced with UNIX will learn UNIX through learning Perl.

You will learn about these topics through detailed descriptions and numerous examples of the syntax and semantics of the language:

- Data types and data structures
- Operators and control flow
- Regular expressions
- I/O facilities
- Database access
- User-defined functions

Key to tutorials

Full-day class: (9:00am–5:00pm): 2 units

AM: half-day class (9:00am–12:30pm): 1 unit

PM: half-day class (1:30pm–5:00pm): 1 unit

New: S6, S7, S8AM, S9PM, S10AM, S11PM, S12AM, M1, M2, M7, M9AM, M10PM, M13AM, M14PM, T3, T5, T7, T8AM, T9PM, T10AM, T16AM, T17PM

☸ **General System Administration:** S1, S4, S5, S6, S7, S10AM, M1, M2, M3, M9AM, M10PM, T1, T12AM, T13PM, T15PM

✉ **Mail:** M4, M15AM, T8AM

▲ **Software Development/Programming:** S2, M6, T2

✪ **Security:** S3, S8AM, S11pm, M5, M6, M7, M14PM, T5, T6, T7, T9PM

❒ **Networking:** S1, S6, S13PM, M2, M8, T1, T3, T4, T9PM, T12AM, T13PM, T14AM, T15PM

■ **Professional Development:** S9PM, S12AM, M11AM, M12PM, M13AM, T10AM, T11PM, T16AM, T17PM

⌬ **Web:** S4, M5, T2

- Writing and using library modules
- An intro to Perl's O-O programming mechanisms.

You will also hear an overview of some of the new Perl 5 modules including examples of full applications for Tk-based graphical programming, CGI programs, and client-server programming.

NOTE: While this course is based on the current release of Perl (version 5.004), it is not intended to be a detailed discourse on all advanced programming constructs now afforded by that release. It is a jump-start course on Perl for experienced UNIX programmers, not an advanced course for previous Perl programmers.

S3 Internet Security for System and Network Administrators

Ed DeHart, *Pittsburgh OnLine, Inc.*

Who should attend: UNIX system administrators, network managers and operations/support staff. A good working knowledge of UNIX is assumed.

What you will learn: How to establish and maintain a secure Internet site.

This tutorial will help you will learn strategies and techniques to help eliminate the threat of Internet intrusions and to improve the security of UNIX systems connected to the Internet. You will also learn how to set up and manage a number of Internet services appropriate to your site's mission.

After completing the tutorial, you will be able to establish and maintain a secure Internet site that allows the benefits of Internet connectivity while protecting their organization's information.

Topics include:

- Latest information on security problems
- UNIX system security
- TCP/IP network security
- Site security policies

"One of the best conferences I have ever attended."
Sharan Kalwani, *Cray Research,*
1996 LISA attendee

S4 Setting Up and Administering a Web Server

Bryan Buus, *XOR Network Engineering*

Who should attend: Webmasters and administrators charged with creating a World Wide Web service for their company. You should have some knowledge of UNIX system administration.

What you will learn: How to set up and maintain a Web server on a UNIX platform.

The World Wide Web is the most widely used Internet service. **Companies are quickly discovering that they need to be on the Web** to provide information to customers and to keep up with the competition. This course describes how to set up and maintain a World Wide Web server on a UNIX platform. The servers covered in the course include the popular and freely-available Apache and NCSA Web servers.

Topics include:

- The architecture of the Web
- The HTTP Protocol
- Compiling the server
- Server configuration
  - Creating "virtual hosts"
  - Resource configuration
  - Access configuration
  - Per-user access
- Analyzing and rotating logs
- Registering and announcing the server
- Web-related security issues
- Electronic commerce issues
- Security and the Web
  - Operating system, CGI, and software considerations
  - Setting up and configuring SSL (Secure Sockets Layer)
- Server performance issues
- Using multiple servers
- Detecting server problems

Setting up the web server is only half of the battle. Understanding exactly how the protocol works, what performance issues are critical, what the security implications are and other nuances are just some of the important issues that all webmasters need to thoroughly understand. After completing this course, webmasters should have an in-depth understanding of their server environment and the critical issues surrounding ongoing maintenance.

S5 NIS+

Marc Staveley, *Consultant*

Who should attend: System administrators and technical managers who must evaluate or set up a NIS+ network. It will be most meaningful to system administrators who have some experience setting up and maintaining a NIS (formerly Yellow Pages) or DNS system.

What you will learn: Why and how to set up and administer a NIS+ network. An overview of what NIS+ is and how it differs from NIS.

You will learn about the benefits of NIS+: its integration with DNS, enhanced security, cross-domain and cross-subnet operability, distributed network information, and dynamic binding. Basic concepts such as NIS+ tables (what are they and how are they used), the name space, and basic terms (e.g. root, master, replica, and client) will be explained.

Topics will include: the *nsswitch.conf* file, setting up an NIS+ domain, setting security levels, bulk loading data, integrating with DNS (as well as an overview of NIS+ commands), and troubleshooting.

S6 ISP System Administration NEW

Barb Dijker, *Labyrinth Computer Services*

Who should attend: ISP managers and experienced system administrators.

What you will learn: Typical pitfalls and problems faced by ISPs and how to avoid or solve them.

An ISP environment provides some specific challenges to system administrators. The user community is highly dynamic and demanding, the security vulnerability is aggressively challenged, and the growth rate is astronomical. We will provide tips to meet these challenges specific to ISPs. We'll discuss typical pitfalls in problems faced by ISPs and how they can be best avoided or solved. Topics include:

- Account management
- Customer service
- Product/service planning
- Security
- Usage tracking
- Billing data integration
- Reliability and redundancy
- Performance

- Resource availability
- Working with the phone company
- Training or hiring talent

S7 Introduction to UNIX Administration NEW ❁

Peter Galvin, *Corporate Technologies, Inc.*

Who should attend: Computer-literate students interested in learning UNIX administration. Some background *using* UNIX will be a plus.

What you will learn: UNIX administration skills for those new to UNIX administration. The course covers all of the essential system administration topics, and stresses professional methods of administration. It uses Solaris as the example operating system when exploring detailed examples.

Topics include:

- The role of the system administrator
- Overview of the UNIX file system
- User authorization and control
- The file system
- System startup and shutdown
- Boot process and start-up files
- Installation from CD, jumpstart, patches, and installing layered software
- File system backups
- System tuning and process control
- Configuration and devices
- Devices (naming, creation, and trouble-shooting SCSI problems)
- Admintool (overview, printing, user management, and terminal configuration)
- Networking and IP configuration
- NFS
- Security
- User services (mail, print, and data transfer)
- Management and troubleshooting
- Performance and monitoring tools

"If you are a UNIX Sys Admin, LISA is a MUST! One can get years worth of information in just one week."
Kirk Waingrow,
publisher
UNIX Guru Universe

S8AM Security Policies & Practices NEW ✪

Marcus J. Ranum, *Network Flight Recorder, Inc.*

Who should attend: System and network managers chartered with defining or enforcing site security policies; IT professionals or auditors interested in Internet-related security policies.

What you will learn: A common-sense overview of security policy and related issues.

How can you secure your network if you can't secure your people? As much as 80% of the security incidents recorded are "inside jobs" or the result of deliberate action by insiders. The preferred way of dealing with the insider problem is to define a set of policies and guidelines that foster a useful security mindset. This course provides a common-sense overview of security policy and related issues, how to perform a risk assessment, and how to build a policy that covers all the bases without going overboard. Topics include:

- **Risk assessment**
  - Risk mitigation
  - Determining acceptable risk
- **Security policies and procedures**
  - Acceptable use
  - Security maintenance
  - Publications policies
  - Damage/spin control policies

S9PM Skills for Consultants NEW ■

Marcus J. Ranum, *Network Flight Recorder, Inc.*

Who should attend: Technical staff in consulting organizations, or future consultants.

What you will learn: A general discussion of issues related to consulting.

Whether or not you plan to make your living as your own boss, it is worth understanding the role and skills of "brainpower by the hour" in today's industry. This tutorial offers advice on the skills needed to effectively find your niche and succeed in today's market. Topics include:

- **Basics**
  - The role of a consultant
  - The consultant's relationship to the customer (management consulting, technical consulting, and corporate psychoanalysis)
  - Finding work and keeping yourself afloat
- **The statement of work**
  - Reaching agreement on tasking and level of effort
  - Managing customer expectations
- **On the mission**
  - Presentation skills
  - Managing politics
  - Effective communications
- **Closing the contract**
  - Writing the report
  - Management presentations
- **Operations**
  - Things you need before you start
  - Contracts, insurance, lawyers, and other disasters
  - Corporate shields
  - Setting fees and billing

S10AM Linux Systems Administration, or Everyone Can Be Root NEW ❁

Bryan C. Andregg, *Red Hat Software*

Who should attend: Systems administrators of all skill levels with little knowledge of Linux who plan to implement Linux in the workplace. You should know basic UNIX systems administration and be able to grasp new concepts relatively easily. Advanced programming skills are not necessary, but the ability to code tasks in a language (*perl*, *tcl*, *sh*, etc.) is very helpful.

What you will learn: The difference between Linux and other UNIX-like operating systems. How to administer a Linux server or workstation.

Key to tutorials
❁ General System Administration
✉ Mail
▲ Software Development/Programming
✪ Security
❒ Networking
■ Professional Development
○ Web

Administering a Linux server or workstation is sometimes a daunting task if your experience is on more mature platforms. We will discuss some key concepts and designs which separate Linux from other UNIX-like operating systems:

- The Linux kernel
- The Linux file system standard
- Plug-in authentication modules
- Services a Linux server can provide
- Linux in a mission-critical environment (RAID, high availability, and scalability)
- Linux in a secure environment (firewalls, secure commerce, and ftp sites)
- Hardware compatibility
- Documentation and where to get help
- Distributions and how to choose one

After completing the tutorial, you should be confident about your ability to set up and maintain a reasonably useful and secure Linux server. If there is time, we will discuss additional topics.

S11PM Handling Computer and Network Security Incidents NEW ✪

Jim Duncan, *Penn State University,* and Rik Farrow, *Consultant*

Who should attend: System and network administrators, security staff, and management responsible for the security of networks and connected systems. Basic knowledge of modern operating systems and networking is recommended because it will help in understanding the example incidents, procedures, and countermeasures.

What you will learn: How your organization can prepare for and respond to computer security incidents.

Are you prepared to handle a security incident at your site? Responding to computer security incidents is a requirement for all organizations in which computer networks are an important part of the infrastructure. You will find out how to prepare for and handle computer and network security incidents with step-by-step information and examples from real-world incidents.

Incident handling ranges from the mundane, yet critical, details of preparing your management and modifying policy to working with an incident in progress and correctly handling evidence. We will explain the types of incidents that typically occur, and how to gain management support in building an incident response team. You will hear about real-life examples of incident handling and the steps involved in recovering from an incident.

You will learn about the need for comprehensive computer security incident handling capability, how to communicate that need to management and the user community, how to investigate an incident (as a handler, not as law enforcement), and how to build and maintain that capability. You will also learn how to adapt policy and the incident handling capability to each other, how to staff an incident response team, and how to establish links and communicate with other teams and law enforcement agencies. Even if you are the only person tasked with security, this tutorial will help you prepare yourself and your organization for an inevitable computer security incident.

S12AM Getting What You Want: Translating Technical Ideas into Funding NEW ■

Maurita Plouff, *Expert Innovations*

Who should attend: Technical people who need to develop internal support and funding for projects.

What you will learn: What the funding process is and how to get your project funded.

When you want to translate technical desires to funded projects, you have to sell your ideas. Learn some of the techniques of professional sales reps and apply them in your technical work to get your ideas heard and approved.

Topics include:

- Understanding the selling process
- Who decides what?
- Organizational differences: consensus, departmentalized, and hierarchy
- Evangelism in the technical arena
- All about persuasion: Teaching, explaining, lobbying, and arm-twisting
- Structuring your proposal
- Trial runs and hot-air balloons
- The proper place for skunkworks
- Getting your proposal heard, spreading the buzz
- What if they say yes?

"Best LISA ever!"
Richard Wong, *Princeton University,* 1996 LISA attendee

S13PM Basics of Domain Name System (DNS) Administration ❐

William LeFebvre, *Group sys Consulting*

Who should attend: Network adminstrators responsible for the administration of a DNS installation, either new or inherited. Attendees should have a basic knowledge of network and system administration. An in-depth understanding of IP will be beneficial but is not required.

What you will learn: How to set up, configure, and maintain primary and secondary DNS service on the Internet.

The DNS is the primary method which the Internet uses to name and number machines. This course is an introduction to DNS for network administrators. It will describe the basic operation of DNS, and will provide instructions and guidelines for the installation and operation of DNS on various UNIX machines. Other topics include vendor-specific differences, delegation of subdomains, and troubleshooting techniques.

Monday, October 27

M1 Hot Topics in Modern System Administration NEW ❁

Trent Hein, *XOR Network Engineering* and Evi Nemeth, *University of Colorado, Boulder*

Who should attend: System and network administrators who want to keep abreast of the latest developments in emerging areas.

What you will learn: Latest practice in some hot-topic areas.

Overwhelmed by the rapid change in the system administration field? Need to learn some useful skills *quickly*? This tutorial is a potpourri of learning about hot topics that will make you more effective in your role as a system administrator. Specifically, we'll be covering the following:

Squid cache—The *squid* internet object cache is a very high-performance proxy caching system for web clients. When deployed correctly, it can drastically improve the performance of your network and reduce the need to purchase external bandwidth. We'll talk about

how to implement this hierarchical tool at your site in a practical manner.

Security packet filtering primer—All too often these days, you hear about firewalls. But what does it really mean, and how do you set up a packet filter list to implement a basic one? We'll teach you the dos and don'ts of creating a tough packet filter, and talk specifically about how to apply one in an environment using Cisco routers.

Samba—Being invaded by PCs on your network? This system can help you integrate both existing and future UNIX file-sharing and print-sharing systems with PCs on your network—without pain! Learn how to plan, configure, and manage integrated PCs with Samba on your network.

Bind 8.*x*—BIND, also known as *named* or the DNS server, has been changing to keep up with the times. Have you? We'll cover the recent changes that have been made in BIND, as well as how to set the newest version up in your network.

6bone—Ready or not, here it comes. It's time to start testing applications at your site that use the "next generation" IP protocol, IPv6. Learn how you can set up a test bed and connect to the "6bone" to begin learning about IPv6 in a hands-on manner before it's too late.

WAN performance—Practically every site these days has a WAN—whether it be for Internet or Intranet. How do you measure the performance you are getting from your WAN? We'll introduce you to the basics of practical WAN performance monitoring.

M2 Fault Tolerance, High Availability, and Network Design in Today's Client-Server Environments NEW ☸ ❒

Karl Andersen, *SystemExperts Corp.*

Who should attend: Client-server computing planners and managers; Web site and intranet planners; network planners, managers and designers.

What you will learn: How to guarantee high availability of mission-critical client-server data on your network.

Networked clients need access to servers' resources, but those servers and the networks that connect clients to them come and go. Just as traditional host-oriented computing gave rise to fault-tolerant servers, networks have given rise to new ways of attaining increased uptime. This course will review the tools and techniques used to ensure access to mission-critical client-server data. Topics include:

- Fault-tolerance and enhanced availability
- Server- and client-based data replication
- The impact of transaction processors on enhanced availability
- The impact of connection-oriented and connectionless technologies on server transitions
- Enhanced availability on the Internet
- Security concerns
- Historical approaches for achieving enhanced availability
- Best practices today
- Server replication
- Client-side mirroring
- Customer case studies

M3 Topics in Solaris System Administration ☸

Marc Staveley, *Consultant*

Who should attend: System administrators who need to know the differences between SunOS 4.*x* and Solaris 2.*x* system administration. Portions of this course will be useful from a BSD to Sys V.4 perspective. It will be most meaningful to sys admins with some experience setting up and maintaining a network of SunOS 4.*x* workstations and servers.

What you will learn: New features in the Solaris operating system (e.g., the CacheFS file system). New methods for accomplishing similar tasks in SunOS (e.g., the new NFS administration commands).

Topics include:

- Installation (packages, jumpstart, etc.)
- Booting and halting
- Kernel enhancements (dynamic loading, multi-threading, layout on disk, and */etc/system*)
- Networking (NFS, AutoFS Automounter, and PPP)
- AutoFS and CacheFS (including cache-only clients)
- NIS+ vs. NIS (YP)
- Service Access Facility (a *getty* replacement and much more)
- Printing (*lpd* vs. *lpsched*, SunSoft print client)

M4 Sendmail Inside and Out (Updated for Sendmail 8.8) ✉

Eric Allman, *Consultant*

Who should attend: System administrators who want to learn more about the Sendmail program, particularly details of the configuration file. Programmers implementing new mail front ends who want to know exactly what Sendmail can do for them *(this tutorial covers Sendmail, not mail front ends)*. This will be an intense, fast-paced, full-day tutorial intended for people who have already been exposed to Sendmail.

What you will learn: The latest release of Sendmail version 8.8.

Sendmail is arguably the most successful UNIX-based mail transfer agent in the world today. Originally distributed with the Berkeley Software Distribution, Sendmail is used by most UNIX vendors. After introducing a bit of the philosophy and history, topics will include:

- The syntactic elements of the configuration file: mailers, options, macros, classes, headers, precedences and priorities, trusted users, key file definitions, and rewriting rules and rulesets
- The flow and semantics of rulesets, including hints about debugging
- Introduction to SMTP and how Sendmail operates in an SMTP environment
- Day-to-day management issues: alias and forward files, "special" recipients (files, programs, and include files), mailing lists, command line flags, tuning, and security.
- How Sendmail interacts with the Domain Name System (DNS)
- An introduction to the *M4* configuration package included with Sendmail 8.

"From morning to night, there was always something applicable to do."
1996 LISA attendee

Key to tutorials
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❒ Networking
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M5 Security on the World Wide Web ✪ ➲

Daniel Geer, *CertCo, LLC*, and Jon Rochlis, *SystemExperts Corp.*

Who should attend: Anyone responsible for running a Web site who wants to understand the tradeoffs in making it secure. Anyone seeking to understand how the Web is likely to be secured.

What you will learn: A comparison of available methods of Web security.

The World Wide Web is perhaps the most important enabler (so far) of electronic commerce. It has grabbed the popular imagination and the engineering and marketing efforts of a generation of on-line entrepreneurs and consumers. But the Web was initially designed with little thought to industrial-strength security. Over the past several years numerous proposals have surfaced to secure the Web. This course will survey them with the goal of understanding the strengths and weaknesses of each.

Topics include:

- Client-server network security
- A brief overview of encryption and its role in all security
- Simple schemes: Basic Auth
- Prevailing protocols: SSL, S-HTTP, PCT
- IP security
- Payment protocols: Cybercash, Digicash, Open Market, First Virtual, Visa/Mastercard (SET) and others
- Secure operation: Configuration, containment, interaction with firewalls, replication, proxy servers, logging

M6 Security for Software Developers: How to Design Code that Withstands Hostile Environments ▲ ✪

Marcus J. Ranum, *Network Flight Recorder, Inc.*

Who should attend: System managers and software engineers who are developing client-server applications that will be used over the Internet.

A strong background in UNIX and UNIX programming is recommended. Many examples will refer to C programming constructs. Familiarity with C is not a prerequisite, but familiarity with programming under UNIX is strongly recommended for attendees.

What you will learn: How to write security-critical networking software.

Increasingly, client-server software is being deployed in hostile environments that it may not have been designed to withstand. You will learn how to spot and avoid making typical flaws in security programming, using examples and case studies from existing applications.

Topics include:

- **Basics**
  - Taxonomies of software and system flaws
  - The importance of security
  - Putting security at the right layer
  - Orange book (C2, B1, B2 systems)
  - Authentication versus authorization
- **Data protocols**
  - How protocols are secure or insecure
  - Designing a protocol for security
  - Typical weaknesses of protocols
- **Using cryptography**
  - Basics: public key, secret key, certificates
  - Randomness
  - Algorithms
  - Synchronizing protocols
  - What cryptography can and cannot do
- **Authentication**
  - What to authenticate
  - Challenge/response
  - Authenticating packet streams
  - Publicly-available authentication systems
- **Writing secure network daemons**
  - Chroot
  - Setuid
  - Minimizing code
  - How to avoid doing everything as "root"
- **Case studies**
  - A simple file transfer daemon
  - Using file system permissions
  - Locking up a process

M7 Firewall Management and Troubleshooting NEW ✪

Char Sample and Mark Teicher, *PriceWaterhouse*

Who should attend: System integrators, firewall support staff and managers, security managers, and other interested parties. Expertise running a firewall or a previous class on firewalls is strongly recommended.

What you will learn: Firewall troubleshooting and problem-solving techniques and tools.

Now that your firewall is installed (perhaps by someone else), how do you deal with the problems that will almost certainly come up? This tutorial focuses on the tools and techniques used to solve the most typical problems that occur after the installer has left.

Troubleshooting and problem-solving topics include:

- DNS
- Sendmail
- Routing, subnetting, and load sharing
- Access lists
- Logging and reporting
- VPNs
- Authentication
- Operating systems problems

This tutorial will cover the symptoms associated with each problem area, how to isolate a problem, and the solution. We will discuss which techniques to try when there is abnormal behavior. You will take with you the tools necessary to increase your problem-solving capabilities with regard to your firewall.

M8 Administration of a Local IP Network ❐

William LeFebvre, *Group sys Consulting*

Who should attend: Attendees should have some prior experience *using* IP networks, but do not need to be experienced administrators.

What you will learn: The workings of essential Internet protocols and how to administer them.

This tutorial will start with the Internet model and some basics such as numerical addresses and relationships to the ISO model. It will then progress to the fundamentally important protocols: IP, ICMP, UDP, TCP, ARP, and RARP. With this firm foundation, the course will focus on effective administration of a local IP network. Topics include:

- Routing basics and interior routing protocols
- Subnetting
- Classless routing
- BOOTP/DHCP
- UNIX host configuration
- Troubleshooting

As time permits, there will be an overview of the protocols used by the popular application level programs: Telnet, TFTP, FTP, SMTP, and *rexec*.

M9AM Administering Windows NT 4.0 NEW ❁

Chris Aranosian, MCSE, MCT, *Lehman Brothers*

Who should attend: Experienced system administrators new to Windows NT. Systems professionals who seek a rapid "real-world" introduction to Windows NT 4.0 Workstation and Server, ranging from small workgroups to large, multi-domain architectures.

What you will learn: Essential skills necessary to begin managing and troubleshooting Windows NT systems.

Effective Windows NT systems administration requires a balance of conceptual understanding and practical skills, and this tutorial will address both areas. Topics include:

- Definitions of essential terminology (including workgroups, domains, trusts, SIDs, and rights *vs.* permissions)
- User and group account management with User Manager for Domains
- Administering servers and workstations with Server Manager
- Managing file and folder security with the Windows NT File System (NTFS)
- Viewing the registry with REGEDIT

M10PM Advanced Heterogeneous Systems Management—UNIX and Windows NT NEW ❁

Yuval Lirov and Andrew Rieger, *Lehman Brothers*

Who should attend: Systems support and management personnel in distributed environments who must integrate UNIX with Windows NT workstations while reducing outages, improving performance, and controlling support costs. Participants should have basic database or systems administration knowledge on either UNIX or Windows NT environments.

What you will learn: Techniques for administering a heterogenous architecture.

This tutorial offers real-world, tested techniques for the popular integrated architectures. The techniques reflect state-of-the-art industry experience managing all aspects of computing including systems, databases, and the production batch cycle in a mixed UNIX/Windows NT environment.

Topics include:

- Cross platform architecture for systems management tools
- Thin clients, fat servers, and centralized configurations
- High-availability architectures—RAID, AFS, Veritas
- Centralized user management in a heterogeneous, distributed environment
- Support accountability and management by the numbers
- Client satisfaction in a cost-control environment
- Crisis management and formalized teamwork
- Performance architecting/tuning

M11AM Talking Technical—Breaking the Communication Barrier ■

Maurita Plouff, *Expert Innovations*

Who should attend: Technical people (programmers, administrators, and managers) who may be having difficulties communicating technical topics to non-technical audiences.

What you will learn: How to communicate technical information to non-technical colleagues.

Communication involves not only the speaker and listener, but also their beliefs, preconceptions, and roles within the work environment. The different requirements and contexts in technical work and business/managerial work create barriers to understanding.

These barriers can place limits on your personal growth as well as on your company's—if you cannot communicate effectively with your manager or your customers, you may lose their trust and recognition. This tutorial will point out the problems in communicating effectively with non-technical colleagues, and help you remedy those problems. Topics include:

- Communications mechanics: The basics
- Happytalk, marketspeak, and jargon
- Defining content: A three-step process
- Understanding your audience
- Structuring your message to meet your goals
- When to speak, when to present, and when to write a memo
- Closing the loop: Decoding feedback

M12PM Effective Meetings: Get More Done in Less Time ■

Maurita Plouff, *Expert Innovations*

Who should attend: People who wish to waste less time in meetings.

What you will learn: How to make meetings more useful and efficient for you and other attendees.

Meetings are a fact of life, and larger, more complex projects often involve larger, more complex meetings. Often we wonder "why was that meeting necessary?" A good meeting is necessary, timely, concise, and purposeful. Learn strategies to improve the quality of your meetings, whether you are hosting or attending them. Topics include:

- Meeting madness: Is this meeting necessary?
- Rule #1: Know what you want
- Roping 'em in: Three steps to get an audience
- Great expectations: Agenda dos and don'ts
- When you're leading the meeting: Special responsibilities
- Be a better participant: A checklist
- What about minutes?
- Meeting secrets: The post meeting review
- Special situations
  - Mega-meetings
  - Teleconferencing
  - Videoconferencing
  - Translations

M13AM Managing Support Staff NEW ■

Barb Dijker, *Labyrinth Computer Services*

Who should attend: Anyone who will supervise support staff and/or a user "help desk."

What you will learn: Support staff management skills and techniques.

From the trenches, management looks easy—until you get there. Managing a highly-

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skilled staff in a demanding user-support environment adds complications. How do you improve or maintain quality user service without sacrificing the staff? This tutorial provides an overview of strategies for establishing or improving your support organization and keeping your staff productive and happy to stay.

We will discuss topics such as defining user services, tracking, prioritizing, system monitoring, hiring/firing, training, tools, and documentation. In addition, we will discuss traditional staff management topics, considering the challenges specific to a support environment including communication, team roles, delegation, evaluation, and promotion.

M14PM Developing Computing Policies NEW ✪

Barb Dijker, *Labyrinth Computer Services*

Who should attend: Computing professionals who may become involved in setting, reviewing, or enforcing computing policies.

What you will learn: How to establish computing policies.

Everyone knows they should have computing policies—but where do you start? This tutorial will give you the jump start that you need. The system administrator is usually in the position of enforcing computing policies, but often also ends up drafting or recommending policy. Come prepared to draft or revamp policies for your site. Conducted in workshop style, the discussion will cover everything from getting started to management approval. We will focus on the the pros and cons and practical enforceability of different aspects of and approaches to computing policies.

- What should and should not be included in policies
- Informal *vs.* formal policies
- Policies *vs.* procedures
- Core policies: Authorization and acceptable use
- Pros and cons of specific policies and approaches
- Effect and enforceability
- Organization and distribution
- Management support and implementation

"Excellent tutorial selection."
1996 LISA attendee

M15AM Sendmail from the Trenches ✉

Tina Darmohray, *Information Warehouse!*

Who should attend: System and network administrators who want the very basics to get them started with configuring Sendmail.

What you will learn: Real-world problems and configuring solutions, rather than Sendmail design and programming.

This half-day tutorial is designed to give network administrators an introduction to configuring Sendmail. It will cover the very basics of the *sendmail.cf* file so you can define macros, use DNS MX records, understand rules and rulesets, and rewrite headers. We will then examine ways to:

- Design and implement a mail topology (e.g., a trusted mail hub outside a firewall)
- Support virtual hosts, handle mail for multiple domains
- Interface to popular PC mail solutions (e.g., MS Mail)
- Establish a POP server

Tuesday, October 28

T1 Classic Topics in System Administration ❁ ❐

Trent Hein, *XOR Network Engineering,* and Evi Nemeth,*University of Colorado, Boulder*

Who should attend: System and network administrators who want to learn about real-life solutions to everyday problems.

What you will learn: Best practice solutions to common problems.

Network and security crisis case studies—Past attendees have found that the network crisis case studies we presented provided important insight into common real-world, network problems. We've chosen an all-new set of network and security crises to dissect and correct in front of your eyes.

IPv6—What will 128-bit IP addresses mean to your site? What features and motivations in IPv6 should you be thinking about when planning your network for the future? We'll give you a good overview of the IPv6 standard and explain how it relates to your existing environment.

Advanced routing protocols—The days of RIP as a useful routing protocol are numbered. As internetworks scale rapidly, you have no choice but to look towards protocols such as BGP and OSPF for reliable connectivity. We'll cover the basics of the protocols as well as explain their use in real-world environments.

Security auditing 101—So, you've done everything the experts recommend to secure your site. Now, how do you measure how secure your site really is? We'll take you through the anatomy of a security audit from start to finish.

Network monitoring—Bigger networks need bigger management tools. Until recently, automated network monitoring has been implemented as a mish-mash of home grown tools at most sites. Now there are a number of "production" quality tools available both commercially and from the net. We'll explain what some of these tools really do and compare them for you.

Server performance—Years ago, sinking more money into a bigger CPU was often the fix for performance problems. With CPUs outperforming many other aspects of machines today, performance problems most often appear in areas such as network bandwidth, software optimization, memory usage, and system configuration. Learn how to tune your modern UNIX box to get the most bang for your buck.

T2 CGI and WWW Programming in Perl ▲ ↻

Tom Christiansen, *Consultant*

Who should attend: Programmers with a light background in Perl and HTML. No previous CGI experience is required. If you don't have any Perl background, read the Llama book first or take the S2 tutorial on Sunday. This is neither a "for non-programmers" course nor a "for guru programmers" course. It's for "accidental programmers," folks other than UNIX systems gurus who need to deal with CGI and WWW programming.

What you will learn: CGI and other WWW programming using Perl.

All aspects of writing and processing fill-out forms are covered using the standard CGI.pm module. Some attention is also given

to parsing of HTML documents and writing "spiderbots", automata that navigate the Web on their own. Specific topics include:

- A light introduction to using Perl's object-oriented class libraries
- Setting up your server for CGI and SSI
- An overview of the CGI protocol and SSI
  - CGI-related environment variables
  - CGI without forms
  - Debugging your CGI programs
  - Using UNIX-domain sockets to serialize access to daemons
  - Non-parsed headers scripts
- Data and system security
  - Setuid execution and taint checking
  - Avoiding the perils of shell escapes and backquotes
  - Backgrounding long-running CGI programs
  - Non-parsed headers scripts
  - Sending mail safely
- Sample problems and solutions
  - Remote browser and remote user determination
  - Generating dynamic forms; multistage ("shopping cart") forms
  - Credit-card algorithms
  - File uploads
  - Database access using flat text or HTML files, DBM files, or a full SQL database
  - HTML parsing and link analysis
- Image maps
- Writing well-behaved robots

T3 Advanced Topics in DNS and BIND NEW ❒

Paul Vixie, *Internet Software Consortium*

Who should attend: Name server administrators and software developers who need a deeper understanding of the DNS protocol and of the internals of BIND. Participants should already be responsible for the operation of at least one name server, familiar with Internet protocols such as TCP and UDP, and able to recognize C source code when they see it (which they will).

What you will learn: The DNS protocol and upcoming extensions to it; implementation considerations in BIND.

Topics include:

- DNS message format
- DNS resource record format
- Zone file format, and zone transfers
- Incremental zone transfer
- Dynamic update and deferred update
- Real-time change notification
- DHCP interaction
- BIND current status
- DNS security
- DNS politics
- BIND Version 8

After completing this tutorial, you will know what the IETF has been up to lately, and what to expect in upcoming BIND releases.

T4 IP version 6: An Introduction ❒

Richard Stevens, *Consultant*

Who should attend: Network programmers and system administrators who will be converting applications and networks from IPv4 to IPv6, and implementors of IPv6. You should have a basic understanding of TCP/IP.

What you will learn: How to transition to IPv6 from the administration and programming standpoints.

Various proposals have been made to replace IPv4, mainly to overcome its addressing limitations. The successor has been chosen and named IPv6. Numerous working groups have been busy completing the specifications for all facets of IPv6 and implementations are starting to appear. It is expected that vendor-supplied implementations of IPv6 will appear in the coming years and there will be a gradual transition of the Internet to IPv6.

You will get an overview of all aspects of IPv6, approaching it from the perspectives of a system administrator who needs to transition a network from pure-IPv4 hosts and routers to a mixture of IPv4 and IPv6 nodes, and a programmer who needs to convert applications from IPv4 to IPv6.

Topics include DNS support, new socket address structure, address conversion functions, transition mechanisms, automatic tunneling, header fields and extension headers, source routing, path MTU discovery, upper-layer issues, ICMPv6, multicasting, neighbor discovery, CIDR, anycasting, and mobility.

T5 Network Security Profiles: What Every Hacker Already Knows About You, and What To Do About It NEW ✪

Jon Rochlis and Brad Johnson, *SystemExperts Corp.*

Who should attend: People responsible for network-based applications or systems that might be targets for hackers, or who are proactively improving the security of their hosts, using any type of TCP/IP-based system. You should understand the basics of TCP/IP networking. Examples may use UNIX commands or include C or scripting languages.

What you will learn: How to prepare for attacks and proactively stave them off.

There are four common stages to network-based host attacks: reconnaissance, target selection, exploitation, and cover-up. This course will review the tools and techniques hackers use in attacks. You will learn how to either be prepared for such attacks or how to stay one step ahead of them. You will learn how to generate profiles of your systems remotely and show some of the business implications of these network-based probes.

The course will focus primarily on tools that exploit many of the common TCP/IP-based protocols (such as ICMP, SNMP, RPC, HTTP, and SMTP) which support virtually all of the Internet applications—such as mail, Web technologies, network management, and remote file systems. Many topics will be addressed at a detailed technical and administrative level. We will primarily use examples of public domain tools because they are widely available and commonly used in these types of situations.

Topics include:

- Review of network attack methodology: Reconnaissance, target selection, exploitation, and cover-up
- Attack profiles: What does one look like?

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- Techniques: Scanning, CERTs, and hacking clubs
- Tools: *scotty*, *strobe*, SATAN, ISS, etc.
- Business exposures: Integrity and confidentiality, audits, and intrusion resolution

T6 Joining the Internet Safely Using Firewalls ✪

Tina Darmohray, *Information Warehouse!*

Who should attend: System and network administrators who will implement or maintain a firewall; site managers charged with selecting and setting site security requirements.

What you will learn: The ins and outs of connecting to the Internet using firewalls.

Connecting to the Internet is an exciting event for every organization, but the security implications can often cause hesitation. You will hear about the problems and solutions surrounding interconnection and security of functional intracompany and internetwork connections using firewalls. You will learn about the differences between packet filtering and proxy firewalls. In addition, there will be details and examples of bastion host security using UNIX, and Internet gateway connectivity issues, including Sendmail and Domain Name System (DNS) configurations for your firewalled site. The tutorial concludes with a complete example Internet firewall configuration.

T7 Building a Successful Security Infrastructure NEW ✪

Michele Crabb, *Cisco Systems, Inc.*

Who should attend: UNIX system administrators and data processing or MIS management who have an interest in developing or designing an overall security plan or infrastructure for their site.

What you will learn: Step-by-step guidelines for evaluating your site's security needs and deciding upon the elements of a successful security framework.

Building and maintaining a successful security framework entails performing a detailed analysis of your security needs and examining your current security controls. You will also need to know what security tools are needed, and the right things to keep the framework in place and operational. Overlooking any one of these pieces can mean an unreliable security framework.

The class is not about how to implement UNIX security, but provides an overall picture of how to implement a successful security infrastructure. The class bridges the gap between the technical and the administrative issues of system security.

Topics include:

- Why do we need security and what are some motivating factors?
- The risk assessment process
- Policies and procedures
- Building your infrastructure
- Maintaining your infrastructure
- The security toolbox

T8AM Configuring Sendmail Using the *M4* Macros NEW ✉

Eric Allman, *Consultant*

Who should attend: System administrators who want a practical, hands-on tutorial for building Sendmail configuration files using the *M4* package that comes with Sendmail version 8. This will be a detailed, problem- and solution-oriented tutorial. You should have some familiarity with Sendmail.

What you will learn: How to use Sendmail's *M4*-based configuration package.

The *M4* configuration package that comes with version 8 Sendmail allows simple and easy configuration of Sendmail for many common situations. This tutorial details how to use this package to best effect. Extensive examples will be given.

Topics include:

- The general structure of an *M4*-based configuration file
- Selecting an operating system environment
- Selecting special features
- Using selected external databases
- Frustrating spammers

T9PM Building Secure Intranets NEW ✪ ❒

Marcus J. Ranum, *Network Flight Recorder, Inc.*

Who should attend: Network managers responsible for planning the future design of security critical networks, or IS managers trying to plan effective ways of deploying the various security technologies. You should be familiar with Internet/Intranet applications and protocols.

What you will learn: A technical overview of site security design and maintenance techniques.

As businesses increasingly rely on the Internet and intranets for day-to-day operation, they may be unwittingly accepting substantial risk of security incidents leading to downtime, loss of business, or embarassment. Firewalls and related technologies can help address the problem, but need to be combined with good site security practices to be truly effective. This course provides a technical overview of security design and maintenance techniques that can help you protect your business in the highly-networked future.

- **Implementing security**
  - Network design for security
  - Interconnectivity and security
- **Technologies and tools**
  - Firewalls: What they can and cannot do
  - Dial-in and dial-out
  - Audit tools and network management
  - Web sites
- **Audit**
  - Building a security certification process
  - Building a security maintenance process
  - Auditing your network

T10AM Good Ideas: Presenting Technical Information NEW ■

Maurita Plouff, *Expert Innovations*

Who should attend: People who make presentations. People who need to make simple presentations on complex subjects. People who hate making presentations but have to anyway. If you know it all but can't present it clearly, this course is for you.

Some technical people would rather have a tooth pulled than have to speak in public. Presenting technical information is even more difficult. You will learn tips for making clear and enjoyable presentations.

Topics include:

- Introduction
- Secrets of good presentations
- Refining your message and tuning it for the audience
- Expressing your ideas with numbers, graphs, artwork, and photos

- Graphics that get attention
- Presentation mechanics—media choices, formats, and tips for handling handouts
- Environmental decisions
- Your pre-presentation checklist
- Delivering the message: No snoozing!
- Conquering that nervous feeling
- When things go wrong
- Suggestions for typical situations

T11PM Writing Good Stuff: A Practical Guide for Technical Content ■

Maurita Plouff, *Expert Innovations*

Who should attend: People who write proposals, reports, memos, meeting minutes, feasibility studies, technical requirements, letters, and email.

What you will learn: How to write business documents in less time with greater ease.

We all need to write in our work, but many find it a burdensome task. Learn simple techniques to write clear, concise, compelling material in less time. The course includes examples and tools for better writing.

Topics include:

- Recognizing good writing
- Setting goals
- Audience analysis: Who reads it makes a difference!
- How to manage your writing time
- Start-up strategies: Avoiding writer's block
- Organizing the information
- First drafts, second drafts, *n*th drafts: Theory and practice
- Editing: A 5-step checklist
- Tips for common formats
- Meeting minutes
- Getting action
- Email as an art form
- Documentation and instructions

T12AM Introduction to NNTP and INN ☸ ❒

James Brister and David Lawrence, *Internet Software Consortium*

Who should attend: Netnews server administrators who use or wish to use INN (InterNet News). Participants should be capable UNIX system administrators with experience in setting up new server hosts, managing large file systems, and building programs from freely-available source code.

What you will learn: Basic installation and management of a netnews server using INN.

INN, written by Rich Salz, is the most widely-used software system implementing the NNTP protocol. After completing this tutorial, you'll be able to create and maintain INN server hosts, including reader support, transport (netnews peering) administration, and installation of source code patches to INN.

Topics include:

- Hardware requirements
- Fetching, building and installing INN
- Transport servers *vs.* reader servers
- Article transfer *vs.* article replication
- *innxmit*, *nntplink*, and *innfeed*
- Expire, multiple spindles
- Reports and monitoring
- Troubleshooting

T13PM Advanced Topics in NNTP and INN ☸ ❒

James Brister and David Lawrence, *Internet Software Consortium*

Who should attend: Administrators of INN servers who want a deeper understanding of the NNTP protocol of the INN software system. Participants should already have experience running at least one INN server host.

What you will learn: How to diagnose serious but less-obvious configuration or utilization problems, and be able to make informed decisions about complex enterprise-wide netnews topology.

This tutorial will generally survey the NNTP and NNRP protocols, with special attention to reader *vs.* transport verbs and to the performance implications of offline news servers and Netscape Navigator. Obscure INN performance tuning issues will be covered, as will advanced troubleshooting and debugging techniques.

Topics include:

- Falling behind your provider's feed
- Downstream sites falling behind your feed
- Web browsers *vs. nnrpd* and *fork*
- NNTP streaming *vs. innfeed* parallelism
- *getactive* and what to do about it
- Mail ⇔ news gateways
- Advanced *expire* topics
- Upcoming INN enhancements

T14AM TCP/IP Troubleshooting with UNIX ❒

Jim Hickstein, *CUC Internet Engineering*

Who should attend: All UNIX system administrators, beginning to intermediate network administrators, and advanced users who have to diagnose and fix problems in their TCP/IP networks, or work with others to do so. You should have some familiarity with general networking concepts.

What you will learn: How to isolate, diagnose, and correct the most common failures in TCP/IP networks using a diagnostic decision logic table (DDLT).

The network is down: How do you fix it? This is no time to read a book, and even the best organized textbook is not a good reference in a crisis.

Most sites have no specialist to call when the network breaks, so UNIX system administrators and users are often called on to fix things, but they seldom have a coherent plan of attack. Even people with a great deal of experience with TCP/IP at the application level often lack experience with network pathology.

This tutorial examines a practical problem-solving method using a diagnostic decision logic table (DDLT), developed by the instructor and based on many years' experience. The DDLT gives step-by-step instructions on what to look at, what it should look like, and how to fix it. Even if it's not your job to fix it, you can help get things back on the air quickly by knowing which vital statistics to gather to give the diagnosis a head start.

The tutorial focuses on specific examples of network failures, and introduces and amplifies on TCP/IP and Ethernet concepts. Examples

Key to tutorials
☸ General System Administration
✉ Mail
▲ Software Development/Programming
✪ Security
❒ Networking
■ Professional Development
⟳ Web

are taken from SunOS 4.*x* and Solaris 2.*x* UNIX systems, but apply in principle to any TCP/IP network.

Topics include:

- Using the DDLT
- Discovery: Where to look
- Name Service
  - */etc/hosts*, *ping*
  - DNS: */etc/resolv.conf*, *in.named*
  - NIS: *ypserv*, *ypbind*, */etc/domainname*
  - NIS+DNS: */var/yp/Makefile*
  - Name service switch
- TCP/IP over Ethernet
  - Ethernet interface: *le0*, *ne0*, etc.
  - ARP: The ARP shotgun
  - IP, the Internet protocol
  - ICMP: Echo, Host Unreachable
  - TCP and TELNET
- Network topology and routing
  - Host and network addressing
  - Subnets
  - The routing table, *traceroute*

T15PM Managing Network Printers and Print Spoolers ☸ ❒

Patrick Powell, *AStArt Technologies*

Who should attend: System managers who are faced with managing a wide variety of printers in a distributed and non-homogeneous environment. Participants should be familiar with the basics on UNIX and networking, and the concepts of client-server programming.

What you will learn: An overview of network-based printing, and the various approaches used by UNIX, Novell, and Windows to support printing. We will focus on the problems of supporting a heterogeneous print spooler environment such as BSD, System V, and Windows NT printing.

Topics include:

- Printer interfaces, printer job lanaguages, and page description languages
- Print spooler architecture and functions
- BSD and System V print spooler organization
- Novell and Microsoft print spoolers
- Network protocols—RFC 1179
- Application programs, drivers, and PDL conversion programs
- BSD print spooler
  - Organization
  - LPRng, BSD 4.4 *lpd*
  - Installation of software
  - *printcap* files
  - Filters
- SAMBA and SMB print spooling support
  - Organization
  - Installation
  - Configuration
- Exotic spooling problems
  - System V to *lpd* spooling
  - PCNFSD spooling
  - Windows WINSOCK client programs
- Guidelines and recommendations

Attendees will gain a better understanding of the problems and solutions when managing a large number of printers with different capabilities. In-depth examples include supporting Windows NT print clients on UNIX systems and vice versa, using LPRng and SAMBA.

T16AM Where Your Employer's Liability Stops and Yours Begins: Principles of Agency for the System Administrator NEW ■

Dan Appelman, *Heller, Ehrman, White & McAuliffe*

Who should attend: System and network administrators interested in the legal issues surrounding the employer/employee relationship.

What you will learn: Areas of employment law as it relates to the system administrator, including privacy, defamation, denial of account privileges, export liability, and obscenity/indecency. The state of the law and practical measures to take to minimize personal liability in the workplaces.

What problems arise from the conflicting goals of autonomy and accountability in the employer/employee relationship? The right to free speech, anonymity, and privacy are central concepts in the U.S., but this right is constantly balanced by the need for accountability and the need of the employer to control the workplace.

The course will also focus on the laws and regulations that govern the employer/employee relationship, including those which limit employer and employee liability for the acts of the employee. You will receive concrete suggestions for ways to understand where the line is drawn and how to minimize your own personal liability.

T17PM The Right of Privacy and the Employer/Employee Relationship NEW ■

Dan Appelman, *Heller, Ehrman, White & McAuliffe*

Who should attend: System and network administrators interested in the limitations of the right to privacy in the employer/employee relationship.

What you will learn: The rights and responsibilities of the system administrator regarding the privacy of users, the privacy of the employer, and the right to privacy of the system administrator.

Do you know what the legal right of privacy is, how that right has been recognized by the courts, and what its limitations are? You will learn from actual cases decided by the Supreme Court, by other Federal and state courts, by Congress, and the administrative agencies. We will examine the limitations to the right of privacy in the United States, and compare those limitations to the treatment of privacy in other countries.

This course will also focus on privacy specifically relevant to system administrators and their workplace responsibilities. The instructor will suggest guidelines for dealing with the conflicting goals of privacy and employer control, addressing such questions as:

- Is there anything different about the workplace which either enhances or limits the right of privacy?
- How far can a system administrator go in intruding into the privacy of other employees in the workplace?
- When can a system administrator say "no" to a request by the employer to invade the privacy of other employees?
- What behavior and communications are protected by the right of privacy and what are not?

Key to tutorials
☸ General System Administration
✉ Mail
▲ Software Development/Programming
✪ Security
❒ Networking
■ Professional Development
◌ Web

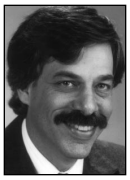
About the Instructors


Eric Allman

Eric Allman was the original author of Sendmail. He was the chief programmer on the INGRES database management project and an early contributor to the UNIX effort at Berkeley. He is on the USENIX Board of Directors and a frequent speaker at USENIX events.


Karl Anderson

Karl Anderson is a founder of SystemExperts, a consulting company with architectural, implementation, and deployment expertise. Karl has worked extensively with major Wall Street firms, commercial and industrial manufacturing companies, and leading on-line service providers helping them to design and implement manageable and secure open systems.


Dan Appelman

Dan Appelman, an expert on legal issues in on-line and Internet commerce, practices computer and telecommunications law at Heller, Ehrman, White & McAuliffe where he represents many high-tech and Internet-related companies. In addition to his law degree, he has a PhD in telecommunications policy.


Bryan C. Andregg

Bryan C. Andregg is a system and network administrator at Red Hat Software. Before joining Red Hat, Bryan was with Internet Direct of Kansas, a 5-state ISP with 5000+ customers, running a server farm of Linux x86 machines.


Chris Aranosian

Chris Aranosian is a Microsoft Certified Systems Engineer and Microsoft Certified Trainer. A Senior Systems Administrator at Lehman Brothers, Chris is a member of the Desktop Integration team, which has designed and implemented the Windows NT desktop management and software distribution systems used globally by Lehman Brothers. He has been involved in providing systems support and training on a variety of platforms since 1987.


James Brister

James Brister is one of the maintainers of INN, and the author of the innfeed transfer utility. James has been a senior UNIX system programmer and administrator for more than 10 years, and is currently a senior software engineer at the Internet Software Consortium.


Bryan Buus

Bryan Buus is the manager of XOR Network Engineering's Web services group. Before joining XOR, Bryan kickstarted O'Reilly & Associates' online efforts. He is a co-author of *Managing Internet Information Services* and has given seminars on managing Web services for CERFnet, the SANS Conference, and Hewlett-Packard's consulting division.


Tom Christiansen

Tom Christiansen is a consultant specializing in Perl applications, optimizations, and training. He is a frequent instructor at USENIX conferences.


Michele Crabb

Michele Crabb is a senior computer security analyst at Cisco Systems where she manages security and provides support for corporate security functions such as the firewalls and remote access security servers. Prior to Cisco, Michele managed security at NASA Ames Research. She has been actively involved in teaching and presenting at technical conferences for the last six years. Michele is also a co-author of the SAGE pamphlet, *System Security—A Management Perspective.*


Tina Darmohray

Tina Darmohray is a consultant in the area of Internet firewalls and network connections. She has over a decade of experience managing and networking UNIX systems. Previously, she was the lead for the UNIX Systems Administration team at a large national laboratory. She was a founding board member of SAGE and edits the SAGE section of *;login:*.


Ed DeHart

Ed DeHart is a founder and former member of the CERT Coordination Center. 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. Today, Ed is the president of Pittsburgh OnLine, Inc.


Barb Dijker

Barb Dijker is a system and network consultant with her own company, Labyrinth Computer Services. She is also the current saver of USENIX faces, the executive director and co-founder of the Colorado Internet Cooperative Association, and principal manager of an ISP called NeTrack.


Jim Duncan

Jim Duncan is manager of network and information systems and principal system administrator for Pennsylvania State University's Applied Research Laboratory. He is a contributor to RFC 1244, the *Site Security Policy Handbook,* and has developed numerous policies, guidelines, and presentations on systems and network administration, computer security, incident handling, and ethics. Jim is an active member of the Penn State CERT team and has primary responsibility for incident handling at the Applied Research Lab.


Rik Farrow

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, US West, Canadian RCMP, Swedish Navy, and for many US and European user groups. He is the author of *UNIX System Security* and *System Administrator's Guide to System V.* Farrow writes two columns for *;login:,* and a network security column for *Network* magazine.


Peter Galvin

Peter Galvin is the chief technologist for Corporate Technologies, Inc. and is on the Board of Directors for the Sun User Group. He has used, programmed, and managed computer systems for 16 years, including nine years with Sun equipment. As a consultant and trainer, Mr. Galvin has taught tutorials on security and systems administration and given talks at many conferences.

About the Instructors


Daniel E. Geer, Jr.

Daniel E. Geer, Jr. is vice president of CertCo, LLC, a market leader in digital certification for electronic commerce. He has a long history in network security and distributed computing management as an entrepreneur, consultant, teacher, and architect. He is co-author of the *Web Security Sourcebook.* He earned a BS from MIT and a PhD from Harvard.


Trent Hein

Trent Hein is chief network architect at XOR Network Engineering. He worked on the 4.4 BSD port to the MIPS architecture at Berkeley, and is co-author of the *UNIX Systems Administration Handbook.*


Jim Hickstein

Jim Hickstein started in UNIX systems administration at a company with 5000 hosts and 200 TCP/IP networks. He was hired as a software engineer but started doing systems administration in self-defense. He now leads the systems administration team at CUC Internet Engineering.


Brad Johnson

Brad Johnson is an authority in the field of distributed systems. He has participated in seminal industry initiatives such as the Open Software Foundation, X/Open, and the IETF, and has published often about open systems. Brad works at SystemExperts where he has led numerous security probes for major companies.


David Lawrence

David Lawrence is one of the current maintainers of INN and has been a highly visible member of the Usenet community for over a decade. His contributions include involvement in many news software projects and service as the moderator of news.announce newgroups for the past six years. Co-author of the recently released book, *Managing Usenet,* David is a member of the technical staff at Vixie Laboratories and the Internet Software Consortium.


Bill LeFebvre

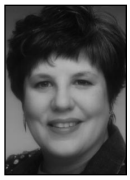
Bill LeFebvre has been banging on UNIX systems since 1981 and has been poking around with Internet technology since 1983. He currently runs Group sys Consulting. He has been a regular tutorial instructor at USENIX conferences since 1992 and is also a columnist for *UNIX Review.*


Yuval Lirov

Yuval Lirov is a senior vice president of UNIX Support at Lehman Brothers. He manages administration of systems, databases, and parallel batch processing for 3,200 UNIX workstations in sales,trading, research, and development. He is an author of *Mission Critical Systems Management* and over 100 technical publications and patents in distributed systems management, troubleshooting, and resource allocation.


Evi Nemeth

Evi Nemeth, a faculty member in Computer Science at the University of Colorado, has managed UNIX systems for the past 19 years, both from the front lines and from the ivory tower. She is co-author of the best-selling *UNIX System Administration Handbook.*


Maurita Plouff

Maurita Plouff is a technologist, manager, and teacher, and has been translating between technical and non-technical audiences since her first post in 1972 as a physics laboratory research assistant. She started her consulting business, Expert Innovations, to solve business problems through creative application of technology and common-sense management. An accomplished speaker, she is known for her ability to avoid inducing the "glassy-eyed stare".

Patrick Powell is CEO of AStArt Technologies. He has taught courses in computer networks, operating systems, and real time systems, and is the developer of LPRng, a LPD-compatible print spooler that was created to solve problems with existing LPD implementations. He is active in the IETF Internet Printing Protocol (IPP) working group, which is developing new standards for network printing.


Marcus J. Ranum

Marcus J. Ranum is CEO of Network Flight Recorder, Inc. He is the principal author of several major Internet firewall products, including the DEC SEAL, the TIS Gauntlet, and the TIS Internet Firewall Toolkit. Marcus has been managing UNIX systems and network security for over 13 years, including configuring and managing whitehouse.gov. He is a co-author of the *Web Security Sourcebook.*


Andrew Rieger

Andrew Rieger is vice president of Equities UNIX Support at Lehman Brothers, managing support of over 900 UNIX hosts, 120 dataservers, and 2500 batches. Prior to Lehman, Andrew worked as a senior systems consultant for Computer Science Corp, Bell Atlantic, and the University of Pennsylvania.

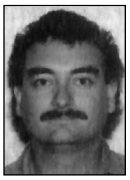

Jon Rochlis

Jon Rochlis is a senior consultant for SystemExperts Corp. He provides high-level advice on network security, distributed systems design and management, high-availability, and electronic commerce. Before joining SystemExperts, he was engineering manager with BBN Planet.


Char Sample

Char Sample is a manager at Price Waterhouse and has installed over 150 firewalls. She has experience with Gauntlet, Eagle, PIX, Firewal1-1, and spent over 3 years supporting Gauntlet Internet Firewall. Char is one of the original five engineers assigned to the FWTK/Gauntlet project.

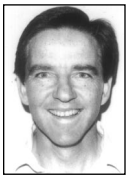
About the Instructors


Marc Staveley

Marc Staveley has 14 years of experience in UNIX application development and administration. An independent consultant, Marc has previously held positions at NCR Corporation, Princeton University, and the University of Waterloo. Among his current projects, Marc is working with the Sun Microsystems Developer Support Centre assisting their customers in migrating from SunOS to Solaris. He is a frequent speaker on the topics of standards-based development, multi-threaded programming and system administration.

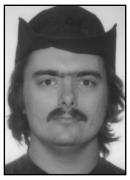

Hal Stern

Hal Stern is a Distinguished Systems Engineer with Sun Microsystems Computer Company, where he focuses on high-end server technology, operations management, networking, performance tuning, and information systems architecture. Hal has been a UNIX administrator and user for more than ten years. He is the author of *Managing NFS & NIS* and the author of several articles on application performance and network design.


W. Richard Stevens, Ph.D.

W. Richard Stevens, Ph.D., is the author of *UNIX Network Programming, Advanced Programming in the UNIX Environment, TCP/IP Illustrated, Volume 1: The Protocols,* and co-author of *TCP/IP Illustrated, Volume 2: The Implementation.* He is a frequent lecturer at USENIX conferences.

Mark Teicher is a senior consultant for Price Waterhouse's Enterprise Security Solutions Group, and has installed over 150 firewalls. He has experience with Gauntlet, Eagle, PIX, Livingston Firewall IRX, and Firewall-1, and was a Livingston Firewall IRX development engineer. He has over 25 years of industry experience.


Paul Vixie

Paul Vixie is the current maintainer of the BIND software system. BIND is the Berkeley Internet Name Domain, and it includes the named name server used everywhere on the Internet. Paul is also a co-author of *Sendmail: Theory and Practice* and the moderator of the comp.sources.unix newsgroup.

USENIX and SAGE Thank Their Supporting Members

USENIX Supporting Members

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Advanced Topics in Systems Administration Workshop

Tuesday, October 28, 1997
9:00 am – 5:00 pm

This one-day workshop will focus on the most recent developments in systems administration, including technical, ethical, and "political" issues. **Attendance is limited, and is based on acceptance of a position paper.** The workshop will be an open forum during which a representative subset of the topics and positions submitted will be discussed.

There are no additional fees to attend this workshop, but attendees must be registered for the conference or the tutorials.

How to Submit

Potential workshop attendees are invited to submit a proposal (in ASCII), of at most three pages, via email to Adam Moskowitz at *adamm@genomecorp.com* no later than September 1. Proposals should contain a topic for discussion, why the topic is relevant, and a personal position on the topic.

Please note that this workshop precludes attending any tutorials on Tuesday (even half-day tutorials). Lunch will be provided.

Wednesday, October 29
9:00am–10:30am

Opening Remarks

Hal Pomeranz, *Deer Run Associates;* and Celeste Stokely, *Stokely Consulting*

Keynote Address: Generation X in IT

Randy Johnson and Harris Kern, *R & H Associates, Inc.*

Generation X in IT. What? A generation gap within IT? Of course there is, just like there is virtually everywhere else. What is so different and how will things change to favor Gen X? From a centralized planned world to one of virtual information management, the impact of Generation X will loom large to change the face of IT as we know it.

Randy and Harris will explore how the IT industry is being influenced permanently by Generation X staffers who are bringing new technical skills and attitudes into organizations. The speakers will offer ample evidence and note important trends, both technical and cultural, to highlight where things are going and how it will impact our role as systems administrators.

Randy Johnson is president of R&H Associates, Inc., which specializes in the design, implementation, and management of distributed mission-critical production systems. He is a co-author of three books: Rightsizing the New Enterprise: The Proof, Not the Hype*;* Managing the New Enterprise*; and the newly-released* Networking the New Enterprise*. He is also co-author of a monthly column, The UNIX Enterprise, which appears in* SunWorld Online.

Harris Kern is a consultant to Fortune 500 companies, helping them establish cost-effective, customer-oriented, and highly-available infrastructures by focusing on people issues and processes. He is co-author of Rightsizing the New Enterprise: The Proof, Not the Hype*;* Managing The New Enterprise*; and the newly-released* Networking the New Enterprise*. Harris is also a SunWorld OnLine columnist .*

10:30am–11:00am **Break**

Refereed Papers Track

Invited Talks Track

11:00am–12:30pm

Monitoring

Session Chair: Adam Moskowitz, *Genome Therapeutics Corporation*

Implementing a Generalized Tool for Network Monitoring
Marcus Ranum, *Network Flight Recorder, Inc.*

Extensible, Scalable Monitoring for Clusters of Computers
Eric Anderson and Dave Patterson, *University of California, Berkeley*

Monitoring Application Use With License Server Logs
Jon Finke, *RPI*

Overview of the Large Scale System Administration of Windows NT Workshop

The program chairs of USENIX's Large Scale System Administration of Windows NT Workshop will select highlights of the workshop for presentation.

12:30pm–2:00pm **Lunch (on your own)**

Lunch (on your own)

2:00pm–3:30pm

The Business of System Administration

Session Chair: Wendy Nather, *Swiss Bank Warburg*

Automating 24x7 Support Response To Telephone Requests
Peter Scott, *NASA Jet Propulsion Laboratory*

Turning the Corner: Upgrading Yourself from System Clerk to System Advocate
Tom Limoncelli, *Lucent Bell Labs*

How To Control and Manage Change in a Commercial Data Center Without Losing Your Mind
Sally J. Howden and Frank B. Northrup, *Distributed Computing Consultants, Inc.*

DNS—Doing Nothing the Same

Joel Avery and Andrew Macpherson, *Nortel Technology*

Northern Telecom and Bell Northern Research have recently merged their corporate appearance into a single entity called Nortel. This project included migrating bnr.ca, nt.com, and bnr.co.uk to "nortel.com," deployment of 100 new DNS slaves, worldwide 24-hour DNS support for *all* Mac, PC, and UNIX machines, and the migration of our IP address repository from a proprietary system to a commercial product.This talk discusses the implications upon the DNS, both on the Internet, and on the 180,000 hosts in the Nortel network.

"LISA has it all. From the tutorials to the technical conference, it's where system administration research and practice meet. LISA is, quite possibly, the most important system administration conference of the year."
Phil Scarr, *Synopsis*

Wednesday, October 29

	Refereed Papers Track	Invited Talks Track
3:30pm–4:00pm	**Break**	**Break**
4:00pm–5:30pm	**System Design Perspectives** Session Chair: Hal Pomeranz, *Deer Run Associates* **Developing Interim Systems** Jennifer Caetta, *NASA Jet Propulsion Laboratory* **A Large-Scale Data Warehouse Application Case Study** Dan Pollack, *America Online* **SHUSE at Two** Henry Spencer, *SP Systems*	**Panel Discussion: 40 Bosses, 3000 Users, 20 Projects… Managing Computers for Academics** Chair: David Parter, *University of Wisconsin* Panelists TBA Sysadmins in academic departments have a lot of fun but often face special challenges. These challanges include the multitude of "bosses" (the faculty), the diversity and frequent turnover of users (the students), and the lack of clear lines of authority and accountability between the faculty, students, and staff. In addition, the department sysadmin must maintain relationships with the campus computing center, while at the same time relying on student staff (who sometimes are allowed to graduate). Facilities managers/senior sysadmins from four sites will present case studies of their facilities. The panel will explore approaches to various issues including staffing, budget and funding, purchasing, security, and training. They will also address relationships to faculty, research projects, the campus computing center, and the institutional bureaucracy.
Thursday, October 30 **9:00am–10:30am**	**Working with PCs** Session Chair: Melissa Binde, *Swarthmore College* **A Web-Based Backup/Restore Method for Intel-Based PCs** Tyler Barnett, *Lexmark International* **Managing PC Operating Systems With A Revision Control System** Gottfried Rudorfer, *Vienna University of Economics and Business Administration* **BAL: A Tool to Synchronize Document Collections Between Computers** Juergen Christoffel, *GMD*	**Logging and Monitoring: How, Why, and When** Peter Honeyman, *CITI, University of Michigan,* and Joe Saul, *ITD OPD&E, University of Michigan* Logging and monitoring is key to UNIX system security—but do you know how to do it effectively? What information should you collect? How do you protect your institution and user community from the potential hazards of logging? In part one of the presentation, Peter Honeyman describes the tools available for logging and monitoring on UNIX systems, and describes strategies for using them to detect intrusion. In part two, Joseph Saul discusses the legal, ethical, and policy implications of logging and monitoring, and the tradeoffs that must be made. As an illustration, Honeyman and Saul describe and critique the Packet Vault, a technique for capturing all network traffic and storing it for post-mortem investigation of a security incident.
10:30am–11:00am	**Break**	**Break**
11:00am–12:30pm	**Inside the Black Box** Session Chair: John Sellens, *UUNET Canada* **Increased Server Availibility Through Failover Capability** Michael R. Barber, *Michigan Technological University* **INN and the Cyclic News Filesystem** Scott Fritchie, *Minnesota Regional Network* **Adaptive Locks for Frequently Scheduled Tasks With Unpredictable Runtimes** Mark Burgess and Demosthenes Skipitaris, *Oslo College*	**So Now You Are the Project Manager** William E. Howell, *Glaxo Wellcome, Inc.* Do we congratulate you or express our condolences? Have you just strapped yourself to the solid fuel rocket booster that will take you to the heights of your career? Or, have you just been sized for a pair of concrete shoes that will take you to the bottom of the East River? The success of a new project manager can be enhanced by means of a mentor, a seasoned, more senior project manager to act as a sounding board and a guiding light. But what if you don't have that mentor? What if you don't have that senior person to consult with? Where do you turn? Learn the critical success factors that will enable you to be a successful project manager.

Thursday, October 30

Refereed Papers Track

Invited Talks Track

12:30pm–2:00pm — **Lunch (on your own)**

Lunch (on your own)

2:00pm–3:30pm

Work-In-Progress Reports (WIPs)

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 is not quite ready to be published, a WIP is for you! We are particularly interested in presenting student work.

To reserve your presentation slot, contact the WIPs coordinator via email to *lisawips@usenix.org.* A list of topics is announced on-site.

When UNIX Met Air Traffic Control

Jim Reid, *RTFM Ltd.*

The management of Europe's congested air space is partly handled by custom software running on Eurocontrol's UNIX systems. These servers process all flight plans and optimize slot allocations for European air space. This service has uniquely difficult operating criteria: downtime is not permitted, data must never be lost and the service must run 24 hours a day, every day of the year.

This presentation will describe the operating environment and management structure at Eurocontrol. Configuration management and change control/administration procedures are also explained. It also discusses some of the problems caused by attempts to automate the task of system administration.

3:30pm–4:00pm — **Break**

Break

4:00pm–5:00pm (4:00pm–5:30pm for Invited Talks)

Net Gains

Session Chair: Josh Simon, *Paranet*

Creating the Network for Lucent Bell Labs Research
Tom Limoncelli, Thomas Reingold, Ravi Narayan, and Ralph Loura, *Lucent Bell Labs*

Instrumenting and Tuning a Very High Performance Web Server
Douglas L. Urner, *BSDI*

Enterprise Backup and Recovery—Do You Need a Commercial Utility? (4:00pm–5:30pm)

W. Curtis Preston, *Pencom Systems Administration*

Every backup implementation leaves out something. Historically this has been because good methods to back up all types of data have not been available. Attempting to rectify this, many companies have purchased products that they did not need, and others have purchased the wrong products.

This talk will explain the different types of data that must be backed up, and the native and public domain utilities that attempt to do so. An overview will follow of all the types of commercial products available, including software and hardware.

Friday, October 31
9:00am–10:30am

Config Management

Session Chair: Paul Anderson, *University of Edinburgh*

Automation of Site Configuration Management
Jon Finke, *RPI*

An Anarchists Guide to Herterogeneous Configuration Management
Alva Couch, *Tufts University*

An Analysis of UNIX System Configuration
Remy Evard, *Argonne National Lab*

A Technologist Looks at Management

Steve Johnson, *Transmeta Corp.*

Managers and employees have models in their heads for what the manager/employee relationship should look like. Unfortunately, no two people seem to have the same model. This causes tension as our boss fails meet our expectations, even as we fail to meet his or hers.

This is a somewhat irreverant look at management by someone who is a technical person, but has managed research and development in both large companies and startups. The aim is to present material that Dilbert would approve of.

We talk about common models, how to smoke out differences between your model and your boss's, and how to resolve those differences. We touch on job descriptions, dealing with deadlines and the resulting stress, dealing with bozos in your management chain, making your boss/employee look good, performance reviews, trust, teamwork, dealing with difficult employees or peers, squeaky wheels, planning, budgets, diversity, power, harassment, petty tyrants, and, after all this, how to decide whether you want to manage, and how to start to do it well.

"LISA lets me keep abreast on what's going on in the industry, not only for information relevant to my current job but also for other technical subjects of interest."

1996 LISA attendee

Friday, October 31

Refereed Papers Track

Invited Talks Track

10:30am–11:00am **Break**

Break

11:00am–12:30pm **Mail**

Session Chair: Bill LeFebvre, *Group sys Consulting*

Tuning Sendmail for Large Mailing Lists
Rob Kolstad, *BSDI*

Selectively Rejecting Spam Using Sendmail check_Rulesets
Robert Harker, *Harker Systems*

A Better Email Bouncer
Rich Holland, *Rockwell Collins*

IPv6 Deployment on the 6bone

Bob Fink, *Lawrence Berkeley National Labs.*

This talk will cover real operational experiences learned from the 6bone, the test and early deployment network for the IPng (Internet Next Generation) IPv6 protocol. This will include an example of how to put a site up on the 6bone and operational experiences such as site renumbering (considered hard to do with IPv4, but easy with IPv6). The new and very promising Aggregator-based unicast addressing architecture will also be presented.

12:30pm–2:00pm **Lunch (on your own)**

Lunch (on your own)

Joint Sessions

2:00pm–3:30pm **Panel: Is System Administration a Dead-End Career?**

Moderator: Celeste Stokely, *Stokely Consulting*

Panelists: Bill Howell, *Glaxo Wellcome, Inc.;* Wendy Nather, *Swiss Bank Warburg;* and Hal Pomeranz, *Deer Run Associates*

3:30pm–4:00pm **Break**

4:00pm–5:30pm **The LISA Quiz Show!**

Hosted by Rob Kolstad, *BSDI*

How to Join

Joining is easy. When you register for LISA, be sure to check off the membership box on the registration form and pay the non-member fee. You can also send email to *office@usenix.org* or phone 510.528.8649. Visit our Web site: *http://www.usenix.org*.

About USENIX

USENIX is the Advanced Computing Systems Association. Since 1975 USENIX has brought together the community of system administrators, engineers, scientists, and technicians working on the cutting edge of the computing world.

USENIX conferences have become the essential meeting grounds for the presentation and discussion of the most advanced information on the latest developments of all aspects of computing.

USENIX and its members are dedicated to:

- Problem-solving with a practical bias
- Fostering innovation and research that works
- Communicating rapidly the results of both research and innovation
- Providing a neutral forum for the exercise of critical thought and the airing of technical issues.

About SAGE

SAGE, the System Administrators Guild, is a special technical group within USENIX. SAGE is an international organization of system administrators dedicated to the recognition and advancement of the system administration profession. To join SAGE, you must be a member of USENIX.

SAGE co-sponsors system and network administration conferences, publishes SAGE News in the Association's bi-monthly newsletter, conducts an annual system administration salary survey, fosters relationships with international affiliates, facilitates the work of regional system administration groups, and publishes an on-going series of practical booklets and resource guides covering topics of interest to system administrators.

SAGE also maintains a Web site which includes member services and a jobs center. It also sponsors the annual SAGE Outstanding Achievement Award.

LISA '97 Vendor Exhibition

Wednesday, October 29 12:00 noon–7:00 pm
Thursday, October 30 10:00 am–4:00 pm

See demonstrations of innovative solutions that can put you ahead with your systems management. Publishers and booksellers will be there to provide the latest print and software releases. And, several companies will be recruiting or contracting employment.

Questions?
More information?
Contact Cynthia Deno
Phone: 408.335.9445
Email: *display@usenix.org*

Participants (as of June 4, 1997)

ANDATACO *www.andataco.com*
Attachmate *www.attachmate.com*
Auspex Systems *www.auspex.com*
Cache Flow *www.cacheflow.com*
CheckPoint Software Technologies *www.checkpoint.com*
CommVault Systems *www.commvault.com*
Competitive Automation *www.join.com*
CrossWind Technologies *www.crosswind.com*
DataLynx *www.dlxguard.com*
Digital Equipment *www.digital.com*
EIS Computers *www.eis.com*
Enhanced Software Technologies *www.estinc.com*
ENlighten Software Solutions *www.enlighten.sftw.com*
Enterprise Systems Management *www.esm.com*
Esker *www.esker.com*
Falcon Systems *www.falcons.com*
Fastlane 101 (Inmartech) *www.fastlane101.com*
Fujitsu Microelectronics *www.fujitsu.com/sparcupgrade*
Globetrotter Software *www.globetrotter.com*
GraphOn *www.graphon.com*
Hummingbird Communications *www.hummingbird.com*
IntelliSoft *www.isoft.com*
Invincible Technologies *www.invincible.com*
ISS (Internet Security Systems) *www.iss.net*
Lightwave Communications *www.lightwavecom.com*
MAGMA *www.magma.com*
Miller Freeman *www.mfi.com*
MindSource Software Engineers *www.mindsrc.com*
MTI Technology *www.mti.com*
Net Daemons Associates *www.nda.com*
Network Appliance *www.netapp.com*
nStor *www.nstor.com*
O'Reilly & Associates *www.ora.com*
Open Systems Management *www.osmcorp.com*
Overland Data *www.overlanddata.com*
PDC *www.pdc.com*
Pencom Systems Administration/PSA *www.pencom.com*
Platform Computing *www.platform.com*
Prentice Hall PTR *www.prenhall.com*
QMASTER Software Solutions *www.qmaster.com*
RDI Computer *www.rdi.com*
Red Hat Software *www.redhat.com*
ROSS Technology *www.ross.com*
San Diego Technical Books *www.sdtb.com*
SCH Technologies *www.sch.com*
Software Moguls *www.moguls.com*
Symark Software *www.symark.com*
Syncsort *www.syncsort.com*
Syntax *www.syntax.com*
Taos Mountain *www.taos.com*
TeamQuest *www.teamquest.com*
The Walt Disney World Company *www.disney.com*
Touch Technologies *www.ttinet.com*
Transarc *www.transarc.com*
UniTree Software *www.unitree.com*
VA Research *www.varesearch.com*
Vangard Technology *www.vangard.com*
VERITAS Software *www.veritas.com*
Walnut Creek CDROM *www.cdrom.com*
Western Scientific *www.wsm.com*
Workstation Solutions *www.worksta.com*

FREE EXHIBIT ADMISSION—Vendor Guests

Please complete. Information is confidential.

Open: Wednesday, October 29, 12 noon–7 pm
Thursday, October 30, 10 am–4 pm
Location: Mission Ballroom, Town & Country Hotel
500 Hotel Circle North, San Diego, CA 619.291.7131

USE THIS PASS ONLY if you do not register for LISA Tutorials nor Technical Sessions. Please copy and share with your colleagues.
Mail to: USENIX Conference Office; 22672 Lambert Street, Suite 613; Lake Forest, CA 92630. Fax: 714 . 588 . 9706

What is your affiliation (check one):
❑ academic ❑ commercial ❑ gov't ❑ R&D

What is your role in the purchase decision (check one):
1. ❑ final 2. ❑ specify 3. ❑ recommend 4. ❑ influence 5. ❑ no role

What is your primary job function (check one):
1. ❑ system/network administrator 2. ❑ consultant 3. ❑ academic/researcher
4. ❑ developer/programmer/architect 5. ❑ system engineer
6. ❑ technical manager 7. ❑ student 8. ❑ security 9. ❑ webmaster

How did you first hear about this meeting (check one):
1. ❑ USENIX brochure 2. ❑ newsgroup/bulletin board 3. ❑ *;login:*
4. ❑ Web 5. ❑ from a colleague 6. ❑ magazine 7. ❑ SunWorld email
8. ❑ NetscapeWorld email 9. ❑ JavaWorld email

Name First Last

Company

Work Address

City State Zip Country

Telephone No. Fax

Email Address (1 only please)

❑ *I do not want my address made available except for USENIX mailings.*
❑ *I do not want USENIX to email me notices of Association activities.*

Useful Conference Information

Conference Activities

Schedule a BoF! Talk to an expert! Present new work! Don't miss these special activities, designed to maximize your time at LISA.

Birds-of-a-Feather Sessions (BoFS)

Tuesday, Wednesday and Thursday evenings

Do you have a topic that you'd like to discuss with others? Our Birds-of-a-Feather Sessions may be perfect for you. BoFs are very interactive and informal gatherings for attendees interested in a particular topic. Schedule your BoF in advance by sending email to *conference@usenix.org* or by telephoning the USENIX Conference Office at 714.588.8649. BoFs may also be scheduled on-site at the registration desk.

The Guru-Is-In

Have a question that's been bothering you? Try asking a USENIX guru!

Experts from the USENIX community will be available to spark controversy and answer questions. These are informal discussions among participants, one more way at the conference to transmit information. Please contact Guru coordinator Lee Damon at *nomad@qualcomm.com* if you would like to volunteer your expertise.

Work-In-Progress Reports (WIPs)

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 is not quite ready to be published, a WIP is for you! We are particularly interested in presenting student work.

To reserve your presentation slot, contact the WIPs coordinators via email to *lisawips@usenix.org*. A list of topics is announced on-site.

Conference Services

Terminal Room

Internet and dial-out access are provided in the Terminal Room.

Copying facilities will be available to create tapes of miscellaneous GNU and public domain software. The Terminal Room will be open Monday–Friday. Look for details posted to *comp.org.usenix*.

Attendee Message Service

Electronic message service will be available Monday, October 27–Friday, October 31. Email to conference attendees should be addressed: *first_lastname@conference.usenix.org*

Telephone messages during the conference may be left by telephoning the Town & Country Hotel at 619.291.7131 and asking for the USENIX Message Center Desk. The Message Center will be open beginning on Sunday, October 26, 7:30 am–5:00 pm, and continuing during conference hours until October 31, at 3:30 pm.

Social Activities

Welcoming Reception and Kickoff

Saturday, October 25, 6:00pm–9:00 pm

Vendor Exhibition Reception

Wednesday, October 29, 5:00 pm–7:00 pm

Reception

Wednesday, October 29, 7:00pm–9:00pm

Costume Party & Reception

Thursday, October 30, 6:00 pm–8:00 pm

We encourage you to come in costume dressed as your favorite system command, computing equipment, or high-tech concept.

Hotel and Travel Information

Hotel Discount Reservation Deadline: *Friday, October 3, 1997*

The Town & Country Hotel is sold out (as of Sept. 22). We have made arrangements with the following hotel for housing. It is within walking distance of the Town & Country, and a shuttle will be available. It has just completed a full renovation and includes a very large health club, restaurant, lounge, laundry, and free parking.

Be sure to mention USENIX to get the group rate of $80/night single or double (plus taxes).

Quality Resort
Mission Valley
875 Hotel Circle South
San Diego, CA 92108

Toll Free: 800.362.7871
Telephone: 619.298.8281

Need a Roommate?

Usenet facilitates room sharing. If you wish to share a room, post to and check *comp.org.usenix.roomshare*

Discount Air Fares

Special airline discounts will be available for USENIX attendees. Please call for details:

JNR, Inc.
Toll Free in US and Canada:
800 . 343 . 4546
Telephone: 714 . 476 . 2788

Airport to Hotel Transportation

Lindbergh Field, San Diego's International Airport, is located only 15 minutes from the Town & Country Hotel. Cloud Nine Shuttle offers continuous 24-hour van service every 20 to 30 minutes at a current cost of $7.00 one way. Catch the shuttle outside the baggage claim area at the shuttle loading island. Taxi service is available at an approximate cost of $15 one way.

What to Do in San Diego

San Diego abounds with activities for an enjoyable visit: sunshine, scenery, seven miles of shoreline, fine eating, fun night life, and a wide array of things to see and do, including Mexico!

The San Diego Zoo is home to 4,000 rare and endangered birds, mammals, and reptiles and has 6,500 varieties of exotic plants.

Balboa Park includes the famous Zoo, 14 museums, art galleries and theaters in ornate, Spanish-style buildings. Museum topics include art, cars, aerospace, model trains, local history, science, and much more.

Sea World presents a variety of marine life in a large park in Mission Bay. It features 5 shows and more than 20 exhibits and attractions, including Shamu.

The San Diego Wild Animal Park is an 1,800 acre exotic animal and botanical reserve dedicated to the preservation and protection of endangered species. It features a 50-minute

(continued on page 26)

Hotel and Travel Information

guided monorail tour, and has 2,200 animals roaming free. It is a bit further afield, but provides an interesting excursion.

The Gaslamp Quarter is located downtown in the historic district, with restaurants, theaters, galleries, and shops.

Old Town is characterized by adobe haciendas and beautifully restored Victorian homes. You will find shops and restaurants, margaritas, mariachis, and hand-crafted treasures from around the world.

Mexico is only twenty miles away. US and Canadian citizens need only valid identification to recross the border and you can bring back $400 in purchases. You can travel to Tijuana on the San Diego Trolley, a high-speed trolley that runs from downtown to the border. If driving to Mexico, you must have special insurance.

For more information, contact:
USENIX Conference Office, 22672 Lambert St., Suite 613, Lake Forest, CA USA 92630
Phone: 714.588.8649 Fax: 714.588.9706
Email: ***conference@usenix.org***
Hours: M–F, 8:30 am–5:00 pm Pacific Time

Continuing Education Units (CEUs)

USENIX provides Continuing Education Units for a small additional administrative fee. Established by the International Association for Continuing Education and Training, the CEU is a nationally recognized standard unit of measure for continuing education and training, and is used by thousands of organizations across the United States. Each full-day tutorial, or two half-day tutorials, 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.

Registration Information and Fees

Student Discounts and Stipends

Tutorials: A limited number of seats in each tutorial are reserved for full-time students at the special rate of $70.00 for either two half-day tutorial classes or one full-day tutorial (2 units). To take advantage of this, you must telephone the conference office to confirm availability and make a reservation. You will receive a reservation code number which must appear on your Registration Form. Your registration form with full payment and a photocopy of your current student ID card must arrive within 14 days from the date of your reservation. If they do not arrive by that date, your reservation will be canceled. This special fee is non-transferable.

Technical Sessions: USENIX offers a special discount rate of $75 for its technical sessions for full-time students. You must include a copy of your current student ID card with your registration. This special fee is not transferable.

Stipends: Student stipends are available to pay for travel, living expenses, and registration fees to enable full-time students to attend this conference. To apply for a stipend, read *comp.org.usenix* six to eight weeks before the conference, visit our Web site: *http://www.usenix.org,* or contact Diane DeMartini *(diane@usenix.org)* for more information.

Tutorial Fees (October 26–28)

Tutorial fees include:

- Admission to the tutorial(s) you select
- Printed tutorial notes for your selected courses
- CD-ROM with tutorials and conference proceedings
- Lunch
- Admission to the Vendor Display

Early registration deadline is September 19, 1997. On-site fees apply after that date. The tutorials may be on different days if you wish, so long as there is no overlap (i.e. selecting two AM tutorials on the same day). Full-day tutorial classes cannot be split.

To calculate your tutorial fees:

One half-day tutorial = 1 unit
One full-day tutorial = 2 units

To determine your total tutorial registration fee, add the total number of units you have selected and refer to the fee schedule shown below. A maximum of 2 units per day may be selected.

# Units Selected	Tutorial Fee (until Sept. 19)	Tutorial Fee (after Sept. 19)	CEU Credit (optional)
1 unit	$190.00	$240.00	$15.00
2 units	$335.00	$385.00	$15.00
3 units	$480.00	$530.00	$23.00
4 units	$620.00	$670.00	$30.00
5 units	$765.00	$815.00	$38.00
6 units	$905.00	$955.00	$45.00

Technical Sessions Fees (October 29–31)

Technical sessions fees include:

- Admission to the Technical Sessions
- One copy of the Conference Proceedings
- One copy of the Invited Talks Submitted Notes
- Admission to all social events
- Admission to the Vendor Exhibition

Early registration deadline is September 19, 1997. On-site fees apply after that date.

Registration	Until Sept. 19	After Sept. 19
Member*	$340	$390
Non-Member or Renewing Member**	$435	$485
Full-Time Student (Must provide copy of current student ID Card)	$ 75	$ 75

**The member fee applies to current individual members of USENIX, EurOpen national groups, JUS, or AUUG.*

***Join USENIX/SAGE or renew your membership. Just check the USENIX/SAGE membership box on the registration form, and pay the non-member technical sessions fee. $95 of the registration fee will be designated as dues in full for a one-year individual USENIX/SAGE membership.*

Current USENIX members who wish to join SAGE: you may join SAGE at the USENIX Membership Booth during the conference.

Payment

Payment by check or credit card must accompany the registration form. Purchase orders, vouchers, telephone reservations and email registrations cannot be accepted.

CANCELLATION POLICY
If you must cancel, all refund requests must be in writing and postmarked no later than October 17, 1997. Telephone cancellations cannot be accepted. You may substitute another in your place. Contact the Conference Office for details.

Copy this form as needed. Type or print clearly.

Registration Form *LISA '97 October 26–31, 1997*

Please complete this registration form and return it along with full payment to:

USENIX Conference Office
22672 Lambert St., Suite 613
Lake Forest, CA USA 92630
Phone: 714.588.8649 Fax: 714.588.9706

You may fax your registration form if paying by credit card. To avoid duplicate billing, please do not mail an additional copy.

The address you provide will be used for all future USENIX mailings unless you notify us in writing.

Name First Last

First Name for Badge Member Number

Company / Institution

Mail Stop Mail Address

City State Zip Country

( ) ( )
Telephone No. Fax

Email Address (1 only please) **WWW**

Attendee Profile

Please help us serve you better. By answering the following questions, you help us plan our activities to meet members' needs. All information is confidential.

❑ *I do not want to be on the attendee list.*
❑ *I do not want my address made available except for USENIX mailings.*
❑ *I do not want USENIX to email me notices of Association activities.*

What is your affiliation (check one):
❑ academic ❑ commercial ❑ gov't ❑ R&D

What is your role in the purchase decision (check one):
1. ❑ final 2. ❑ specify 3. ❑ recommend 4. ❑ influence 5. ❑ no role

What is your primary job function (check one):
1. ❑ system/network administrator 2. ❑ consultant 3. ❑ academic/researcher
4. ❑ developer/programmer/architect 5. ❑ system engineer
6. ❑ technical manager 7. ❑ student 8. ❑ security 9. ❑ webmaster

How did you first hear about this meeting (check one):
1. ❑ USENIX brochure 2. ❑ newsgroup/bulletin board 3. ❑ *;login:*
4. ❑ Web 5. ❑ from a colleague 6. ❑ magazine 7. ❑ SunWorld email
8. ❑ NetscapeWorld email 9. ❑ JavaWorld email

What publications or newsgroups do you read related to systems administration issues? _____

REFUND/CANCELLATION POLICY **If you must cancel, all refund requests must be in writing with your signature, and postmarked no later than October 17, 1997. Telephone cancellations cannot be accepted. You may substitute another in your place. Call the conference office for details: 714.588.8649.**

Payment must accompany this form

Payment (U.S. dollars only) must accompany this form. Purchase orders, vouchers, email, and telephone registrations cannot be accepted.

❑ **Payment enclosed.** Make check payable to USENIX Conference.

Charge to my: ❑ VISA ❑ MasterCard ❑ American Express ❑ Discover

Account No. / Exp. Date

Print Cardholder's Name

Cardholder's Signature

Tutorial Program

Tutorials may be on different days, so long as there is no overlap (i.e. selecting two AM tutorials on the same day.) Full-day tutorials cannot be split. Check the boxes next to the tutorial number(s) you wish to attend:

Carry total units to end of each column for each day.

Sunday	Monday	Tuesday	
❑ S1 ❑ S5	❑ M1 ❑ M5	❑ T1 ❑ T5	**Full-day class = 2 units**
❑ S2 ❑ S6	❑ M2 ❑ M6	❑ T2 ❑ T6	
❑ S3 ❑ S7	❑ M3 ❑ M7	❑ T3 ❑ T7	
❑ S4	❑ M4 ❑ M8	❑ T4	
❑ S8AM ❑ S9PM	❑ M9AM ❑ M10PM	❑ T8AM ❑ T9PM	**Half-day class = 1 unit**
❑ S10AM ❑ S11PM	❑ M11AM ❑ M12PM	❑ T10AM ❑ T11PM	
❑ S12AM ❑ S13PM	❑ M13AM ❑ M14PM	❑ T12AM ❑ T13PM	
	❑ M15AM	❑ T14AM ❑ T15PM	
		❑ T16AM ❑ T17PM	
_____ units/day (max. 2)	_____ units/day (max. 2)	_____ units/day (max. 2)	

TOTAL UNITS (max 6): _____

Tutorial Program Fee Schedule
Full-day class = 2 units
Half-day class = 1 unit
*After Sept. 19 add $50 to total fee

Units	Tutorial Fee (until Sept. 19*)	CEU Fee (optional)
1 unit	$190.00	$15.00
2 units	$335.00	$15.00
3 units	$480.00	$23.00
4 units	$620.00	$30.00
5 units	$765.00	$38.00
6 units	$905.00	$45.00

Tutorial Program Fees (Sunday–Tuesday, Oct 26–28)

Enter total tutorial fee from fee schedule above $ _____

CEU units surcharge from fee schedule above $ _____

Late fee applies if postmarked after Friday, September 19, 1997 .....Add $50.00 $ _____

Full-time student, pre-registered or on-site (see pg. 26)
(Attach photocopy of current student ID)

CODE NO. _____ $70.00 $ _____

CODE NO. _____ $70.00 $ _____

CODE NO. _____ $70.00 $ _____

Technical Sessions Fees (Wednesday–Friday, Oct 29–31)

Current member fee..... $340.00 $ _____
(Applies to individual members of USENIX, EurOpen national groups, JUS, and AUUG)

Non-member fee* ..... $435.00 $ _____

***Join or renew your USENIX/SAGE membership, AND attend the conference for the same low price. Check here:** ❑

Late fee applies if postmarked after Friday, September 19, 1997..... Add $50.00 $ _____

Full-time student** fee, pre-registered or on-site..... $75.00 $ _____

Full-time student** fee including USENIX membership fee..... $100.00 $ _____

***Students: Attach a photocopy of current student ID*

TOTAL DUE $ _____