



Symposium on Internet Technologies and Systems (USITS)

December 8–11, 1997

Monterey Marriott and Monterey Conference Center
Monterey, California

A four-day technical program exclusively for Internet researchers; developers and programmers; webmasters and Web site managers.

*Sponsored by USENIX, the Advanced
Computing Systems Association*

SAVE UP TO \$100
Register by Nov. 21

REGISTER NOW FOR TUTORIALS
TO GUARANTEE YOUR FIRST CHOICE.

Seating is limited.

UPDATES: www.usenix.org/events/usits97/

10 Reasons to Attend USITS '97:

1. Choose from 4 focused tutorials that let you gain command of the latest Internet tools and techniques. Topics include:
 - Java Security
 - Web Security
 - Enhancing Performance on the Web
 - Fault-Tolerance, High Availability
2. Learn about the latest Internet developments in 23 refereed papers presented by the top researchers on these topics:
 - Caching
 - Performance
 - Servers
 - Security
 - Monitoring
3. Hold a BoF (Birds-of-a-Feather) session on any topic you like.
4. You'll bring back ideas you can implement immediately on the job.
5. Conference Proceedings are included in your Technical Program registration fee.
6. Network with your peers and share solutions at BoFs, conference luncheons, and receptions.
7. See live demos of new, cool tools.
8. Take home a printed set of Tutorial Notes for each tutorial you attend.
9. Share your new idea that's not quite ready to publish in the Work-In-Progress Reports (WIPs).
10. You get a free tee shirt.

USENIX USENIX is a registered trademark of the USENIX Association.

Conference Organizers

Carl Staelin, *Hewlett-Packard*,
Chair

Mary G. Baker, *Stanford*
University

Matt Blaze, *AT&T Labs—*
Research

Eric Brewer, *U.C. Berkeley* and
Inktomi

Paul De Bra, *Eindhoven*
University of Technology

Richard Golding,
Hewlett-Packard

Larry McVoy, *Cobalt MicroServer*

Pat Parseghian, *Transmeta Corp.*

Margo Seltzer, *Harvard*
University

Doug Tygar, *Carnegie Mellon*
University

Important Dates to Remember:

Registration Discount Deadline: *Friday, November 21, 1997*

Hotel Discount Deadline: *Monday, November 17, 1997*

Program at-a-Glance

Sunday, December 7

Registration	6:00 pm – 9:00 pm
Welcome Reception	6:00 pm – 9:00 pm

Monday, December 8

Registration	7:30 am – 5:00 pm
Tutorial Program	9:00 am – 5:00 pm
Tutorial Luncheon	12:30 pm – 1:30 pm

Tuesday, December 9

Registration	7:30 am – 5:00 pm
Technical Program	9:00 am – 5:00 pm
Symposium Luncheon	12:30 pm – 2:00 pm
Birds-of-a-Feather Sessions	6:00 pm – 10:00 pm

Wednesday, December 10

Registration	7:30 am – 5:00 pm
Technical Program	9:00 am – 5:30 pm
Symposium Reception	7:00 pm – 9:00 pm
Birds-of-a-Feather Sessions	8:00 pm – 11:00 pm

Thursday, December 11

Technical Program	9:00 am – 12:30 pm
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Get the Program. See the quality. Join us at USITS '97.

URL: <http://www.usenix.org/events/usits97/>

Maximize Your Performance and Security on the Web

Dear Colleague,

Are you involved in the support or development of Internet technologies and systems? Are you constantly being pressed to improve performance and security? If you are, this first-time symposium is a special opportunity to learn from real-life experiences and take home solutions to problems you face every day.

You can attend technical presentations which deliver reports of the latest research applicable to your home site. The technical presentations will put you on top of issues in caching, servers, security, applications, information retrieval, and monitoring.

On Monday, December 8, choose among four half-day tutorials on Java Security; Web Security; Enhancing Performance on the Web; and Fault-Tolerance, High Availability, and Network Design. Tutorials are led by experienced teachers who address your concerns; you'll enjoy these tutorials and use the information immediately. See pages 4-6 for detailed descriptions.

There will be plenty of time for meeting your peers and sharing problems and solutions in organized luncheons, receptions, and Birds-of-a-Feather sessions (BoFs). Remember, you can organize a BoF on any topic you choose, or present a Work-In-Progress Report on new work not ready to be published.

The program content is designed to put you on top of new technologies. The program quality is unsurpassed. You need this information. We are providing it at USITS '97.

I hope to see you there.



Sincerely,

Carl Staelin, *Hewlett-Packard*
Program Chair

PS: Seating for tutorials is limited. Reserve your spot now to get your first choice

Questions?

Email: conference@usenix.org

Phone: 714.588.8649 **Fax:** 714.588.9706

Updates: <http://www.usenix.org/events/usits97/>

To register, use the form on page 11.

CONFERENCE ACTIVITIES AND SERVICES

Birds-of-a-Feather Sessions (BoFs)

**Tuesday and Wednesday evenings,
December 9 and 10**

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 telephoning the USENIX Conference Office at 714.588.8649, or email to: conference@usenix.org

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 usitswips@usenix.org. A list of topics is announced on-site.

Student Stipends Available

The USENIX student stipend program covers travel, living expenses, and registration fees to enable full-time students to attend USENIX conferences and workshops. Detailed information is available at the USENIX Web site: <http://www.usenix.org>, by reading *comp.org.usenix*, or sending email to students@usenix.org.

Conference Proceedings

One copy of the proceedings is included with your Technical Program registration fee. To order additional copies, send email to office@usenix.org or call the USENIX office at 510.528.8649.

Internet Connectivity

Network connectivity will be available for your laptop.

Social Activities

Meet the conference speakers and connect with your peers in the community.

There will be a Welcome Reception on Sunday evening, a luncheon for tutorial participants on Monday, a luncheon for all Symposium attendees on Tuesday, and a reception on Wednesday evening.

Gain command of the newest Internet tools and put them to work in your organization immediately.

Join your peers at USITS '97

Sign up for tutorials and you will get an immediate payoff.

Stay on top of the latest technology. Register now for tutorials.

Technology and your environment rapidly change, you juggle ever more responsibilities, and you wonder how you can keep doing it. **USITS spells relief.** Bring home time-saving techniques and practical knowledge.

USENIX tutorials aim to provide the critical information you need. Delivered by experts with hands-on experience, tutorials are practical, intensive, and essential to your professional development.

Our guarantee: If a tutorial does not meet the high standards you expect from USENIX, let us know by the first break and we will either change you to any available tutorial immediately or arrange for you to attend another tutorial at another USENIX event without paying another fee.

Continuing Education Units

USENIX provides Continuing Education Units (CEUs) for a small additional administrative fee. The CEU is a nationally recognized standard unit of measure for continuing education and training, and is used by thousands of organizations. Each full-day USENIX tutorial qualifies for 0.6 CEUs. You can request CEU credit by completing the CEU section on the registration form. USENIX provides a certificate for each attendee taking a tutorial for CEU credit, and maintains transcripts for all CEU students. *CEUs are not the same as college credits. Consult your employer or school to determine their applicability.*

Register now to guarantee your first choice. Seating is limited.

Tutorial Overview

Tutorial fees include:

- Admission to the tutorials you select
- Printed and bound tutorial materials from your session
- Lunch

Each tutorial runs from 9:00 AM to 12:30 PM or from 1:30 PM to 5:00 PM. Please select one morning and one afternoon tutorial. Sorry, no partial registrations are allowed.

Morning Session: 9:00 am – 12:30 pm

- M1AM** Security on the World Wide Web
Karl Andersen, *System Experts Corporation*
- M2AM** Enhancing Performance on the World Wide Web
Fred Douglass, *AT&T Labs—Research*

Afternoon Session: 1:30 pm – 5:00 pm

- M3PM** Fault-Tolerance, High Availability, and Network Design in Today's Client-Server Environments
Karl Andersen, *System Experts Corporation*
- M4PM** Java Security
Prithvi Rao, *Carnegie Mellon University*

About the Instructors

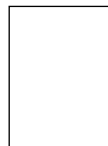


Karl Andersen is a founder of System Experts Corporation, a consulting company with architectural, implementation, and deployment expertise. Karl has worked extensively with major Wall Street firms, commercial and industrial manufacturing companies, and leading on-line service providers, helping them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



Fred Douglass is a principal technical staff member at AT&T Labs—Research. He has published papers on Web performance and is responsible for the AT&T Internet Difference Engine, a tool for tracking and viewing changes to resources on the Web. He has taught distributed computing at Princeton University and the Vrije

Universiteit, Amsterdam. Fred is the chair of the 1998 USENIX Technical Conference and on the program committee of the 7th International World Wide Web Conference.



Prithvi Rao is the founder of Kiwi Labs, which specializes in software engineering methodology and Java training. At Carnegie Mellon University, he has been involved in various projects including mobile robots and holds two patents resulting from that work. He has worked with the SPHINX speech recognition system to develop a speech interface to Netscape.

M1AM Security on the World Wide Web Karl Andersen, *System Experts Corp.*

Who should attend: Anyone running a Web site who wants to understand the tradeoffs in making it secure; anyone worried about Java and ActiveX who wants to understand what the fuss is about. You should understand basic WWW client-server architecture, basic protocol concepts (packets, messages, headers), and basic security concepts (user names, passwords).

What you will learn: Web security issues and available technologies for dealing with them.

The World Wide Web is the most important enabler of electronic commerce, but was designed with little thought to industrial-strength security—a crucial issue if you're trying to avoid monetary loss or bad publicity. Many electronic commerce implementors focus on the look of their site, rather than its security, not fully understanding how the implementation language they use can impact security.

This course will show you how systems such as Web servers, browsers, databases and firewalls fit together and how the various information flows are secured. You will gain an understanding of the tradeoffs in making your systems secure, and you will be able to answer questions such as:

- “Is it okay to use SSL to transfer credit card information?”
- “How secure is the 40-bit encryption in international browsers?”
- “How risky are Java and ActiveX and what is the difference between them?”

Topics include:

- Encryption overview
- Simple schemes (basic authentication/cookies)
- Prevailing protocols
 - Secure Sockets Layer (SSL)
 - Secure HyperText Transfer Protocol (S-HTTP)
 - Private Communications Technology (PCT)
- Downloadable execution
 - Java
 - ActiveX

M2AM Enhancing Performance on the World Wide Web Fred Douglass, *AT&T Labs—Research*

Who should attend: Webmasters and others involved in supporting a Web site; ISP operators who support proxy-caching servers; researchers and developers who want a detailed understanding of Web performance. You should be familiar with Web browsers and the use of the Common Gateway Interface (CGI). You should also be comfortable with basic performance techniques such as caching.

What you will learn: The causes of poor performance and techniques for improving performance of the Web.

The World Wide Web has sometimes been referred to as the “World Wide Wait”. What can content providers do to offer better response time to users and scale to large numbers of clients? Some techniques to be discussed include operating system and network overheads, server replication, image formats, and dynamic content.

There will also be discussion of performance from a client's perspective. Clients often direct their requests through intermediate servers that cache resources on behalf of a larger community. Without careful attention, they can themselves become a performance bottleneck. Proxy caches are one solution. You will gain an understanding of their effectiveness and how to use them. You will learn techniques for improving end-to-end latency, particularly over slow networks such as modems and wireless environments.

The tutorial ends with a discussion of evolving technologies and their impact on performance. Push technology is one example of how the use of the Web is evolving. Streaming media such as RealAudio also affect performance. We will discuss changes to the HTTP protocol (the HTTP/1.1 proposed standard which will permit a greater deal of flexibility in the use of persistent connections), content-encodings such as compression, and pipelined requests.

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 URL: <http://www.usenix.org>

Office Hours: M–F, 8:30 am–5:00 pm, Pacific Time

M3PM Fault-Tolerance, High Availability, and Network Design in Today's Client-Server Environments

Karl Andersen, *System Experts Corp.*

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

What you will learn: Tools and techniques used today to ensure 24 × 7 access to mission-critical client-server data.

Networked clients need access to servers' resources, but the 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 up-time. Topics will include:

- Fault-tolerance and enhanced availability
- Server- and client-based data replication
- Highly-available network topologies
- The impact that transaction processors have on enhanced availability
- The impact of connection-oriented and connectionless technologies on server transitions
- Enhanced availability on the Internet
- Enhanced availability and security

I will also discuss:

- Historical approaches
- Best practices today
- Server replication
- Client-side mirroring
- Customer case studies

M4PM Java Security

Prithvi Rao, *Carnegie Mellon University*

Who should attend: Programmers who know Java; managers knowledgeable about object-oriented programming and familiar with the basic ideas of the Java programming language.

What you will learn: Security-related features of Java.

Authors of Java programs and users of Java applications and applets are forced to deal with the issue of security. Authors of programs must know how to deliver applications securely and users must have the ability to control the importing of executable content into their computing environment. When such content enters their system, they must know how to contain it.

We will examine together the workings of the Java Virtual Machine and see code examples of many security features now available in Java, including the class loader, the security manager, socket factories, and the new Java Cryptography Architecture. You will also learn about the most current security work on the use of Java in Web-based applications. Topics include:

- Java
 - The Java Virtual Machine: Architecture and how it works
 - The class loader: How it works and example of writing a classloader
- Java networking—sockets and socket factories
- Remote Method Invocation—concepts and example code
- Java security
 - General aspects of security
 - Examples of security incidents in the Java world
 - Java system security—the Sandbox model and security manager
 - Java Cryptography Architecture
- Assessment of Java security

Mark Your Calendar Now for These USENIX Events

7th USENIX Security Symposium

January 26–29, 1998 San Antonio, TX

New Network Technologies Symposium

March 2–3, 1998 Salt Lake City, UT

4th Conference on Object-Oriented Technologies and Systems (COOTS)

April 27–30, 1998 Santa Fe, NM

USENIX Annual Technical Conference

June 15–19, 1998 New Orleans, LA

Need detailed information? Visit our Web site:

http://www.usenix.org/events/event_calendar.html

TUESDAY, December 9

9:00am – 9:15am

Opening Remarks

Carl Staellin, Program Chair, *Hewlett-Packard*

9:15am – 10:30am

Keynote Address

Puberty—The Approach to Maturity

Heidi Heiden, *UUNET Technologies*

Heidi Heiden will deliver a report card on this 15-year-old and discuss its past, present and future. In the beginning there were twins. One died. Is the other out of control? At 15 years of age, the Internet is a precocious adolescent, still growing explosively, sometimes lacking fine motor coordination, and driven to explore all kinds of possibly dangerous behavior by wild hormonal urges. What's it like to live with this party animal? How will it mature? What it will look like at 25?



Heidi B. Heiden is a senior vice president at UUNET Technologies where he is responsible for sales, engineering, operations and service. He created and ran the DDN (Defense Data Network), the largest data system of its time, consisting of many worldwide computer networks which formed the basis of what is now known as the Internet. Prior to entering the commercial arena, Mr. Heiden's career in the United States Army included the leadership of such diverse technology programs as the design and implementation of a national voice and data system for the Government of Spain and the design and development of prototype user equipment for the GPS (Global Positioning System) navigation system. Mr. Heiden is a graduate of West Point Military Academy.

10:30am – 11:00am

Break

11:00am – 12:30pm

Caching I

Session Chair: Richard Golding, *Hewlett-Packard*

Study of Piggyback Cache Validation for Proxy Caches in the World Wide Web

Balachander Krishnamurthy, *AT&T Labs—Research* and Craig E. Wills, *Worcester Polytechnic Institute*

Exploring the Bounds of Web Latency Reduction from Caching and Prefetching

Thomas M. Kroeger and Darrel D.E. Long, *University of California, Santa Cruz* and Jeffrey C. Mogul, *Digital Equipment Corporation*

The Measured Access Characteristics of World Wide Web Client Proxy Caches

Brad Duska, David Marwood, and Michael J. Feeley, *University of British Columbia*

12:30pm – 2:00pm

Symposium Luncheon

2:00pm – 3:30pm

Servers

Session Chair: Eric Brewer, *University of California at Berkeley* and *Inktomi*

A Highly Scalable Electronic Mail Service Using Open Systems

Nick Christenson, Tim Bosserman, and David Beckemeyer, *Earthlink*

Improving Web Server Performance by Caching Dynamic Data

Arun Iyengar and Jim Challenger, *IBM T. J. Watson Research Center*

Measuring the Capacity of a Web Server

Gaurav Banga and Peter Druschel, *Rice University*

3:30pm – 4:00pm

Break

4:00pm – 5:00pm

Potpourri

Session Chair: Richard Golding, *Hewlett-Packard*

BIT: A Tool for Instrumenting Java Bytecodes

Han Bok Lee and Benjamin G. Zorn, *University of Colorado*

HPP: HTML Macro-Preprocessing to Support Dynamic Document Caching

Fred Douglass, Antonio Haro, and Michael Rabinovich, *AT&T Labs—Research*

WEDNESDAY, December 10

9:00am – 10:30am

Security

Session Chair: Matt Blaze, *AT&T Labs—Research*

Lightweight Security Primitives for E-Commerce

Yossi Matias, Alain Mayer, and Avi Silberschatz, *Bell Laboratories/Lucent Technologies*

Going Beyond the Sandbox: An Overview of the New Security Architecture in the Java Development Kit 1.2

Li Gong, Marianne Mueller, Hemma Prafullchandra, and Roland Schemers, *JavaSoft, Sun Microsystems*

Secure Public Internet Access Handler (SPINACH)

Elliot Poger and Mary G. Baker, *Stanford University*

10:30am – 11:00am

Break

11:00am – 12:30pm

Monitoring

Session Chair: Larry McVoy, *Cobalt MicroServer, Inc.*

Web Facts and Fantasy

Stephen Manley, *Network Appliance* and Margo Seltzer, *Harvard University*

SPAND: Shared Passive Network Performance Discovery

Srinivasan Seshan, *IBM* and Mark Stemm and Randy H. Katz, *University of California at Berkeley*

Rate of Change and Other Metrics: A Live Study of the World Wide Web

Fred Douglass, Anja Feldmann, and Balachander Krishnamurthy, *AT&T Labs—Research* and Jeffrey Mogul, *Digital Equipment Corporation*

12:30pm – 2:00pm

Lunch (on your own)

2:00pm – 3:30pm

Applications

Session Chair: Pat Parseghian, *Transmeta Corporation*

RainMain: A Workflow System for the Internet

Santanu Paul, Edwin Park, and Jarir Chaar, *IBM T. J. Watson Research Center*

Salamander: A Push-Based Distribution Substrate for Internet Applications

G. Robert Malan, Farnam Jahanian, and Sushila Subramanian, *University of Michigan*

Creating a Personal Web Notebook

Udi Manber, *University of Arizona*

3:30pm – 4:00pm

Break

4:00pm – 5:30pm

Work-In-Progress Reports

Session Chair: Larry McVoy, *Cobalt MicroServer, Inc.*

THURSDAY, December 11

9:00am – 10:30am

Caching II

Session Chair: Paul De Bra, *Eindhoven University of Technology*

Cost-Aware WWW Proxy Caching Algorithms

Pei Cao, *University of Wisconsin-Madison* and Sandy Irani, *University of California, Irvine*

System Design Issues for Internet Middleware Services: Deductions from a Large Client Trace

Steven D. Gribble and Eric A. Brewer, *University of California at Berkeley*

Alleviating the Latency and Bandwidth Problems in WWW Browsing

Tong Sau Loon and Vaduvur Bharghavan, *University of Illinois at Urbana-Champaign*

10:30am – 11:00am

Break

11:00am – 12:30pm

Information Retrieval and Searching

Session Chair: Mary G. Baker, *Stanford University*

The Search Broker

Udi Manber, *University of Arizona*

Using the Structure of HTML Documents to Improve Retrieval

Michal Cutler, Yungming Shih, and Weiyi Meng, *State University of New York at Binghamton*

SASE: Implementation of a Compressed Text Search Engine

Srinidhi Varadarajan and Tzi-cker Chiueh, *State University of New York*

USENIX Membership Information

USENIX is the Advanced Computing Systems Association

Since 1975, USENIX has brought together the community of engineers, programmers, system administrators, and architects 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 new

developments in all aspects of advanced computing systems.

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

Enjoy Great Membership Benefits

As a member of USENIX, you receive:

- Access to papers from USENIX conferences and symposia proceedings
- Free subscription to *login.*, the Association's bi-monthly magazine
- Discounts on registration for technical programs at all USENIX conferences and symposia
- PGP Key signing service (available at some conferences)
- Special subscription rates to the *Linux Journal*
- Savings on selected titles from John Wiley & Sons, McGraw-Hill, MIT Press, Morgan Kaufmann, Nolo Press, O'Reilly & Associates, Prentice Hall, and Sage Science Press
- Discount on all publications and software from Prime Time Freeware
- Discount on publications from The Open Group
- Discount on software from BSDI, Inc.
- Right to vote on matters affecting the Association, its bylaws, election of its directors and officers
- Right to join Special Technical Groups such as SAGE

SAGE is dedicated to the recognition and advancement of system administration as a profession. To join SAGE, you must be a member of USENIX.

The USENIX Association

2560 Ninth Street, Suite 215

Berkeley, CA 94710

Phone: 510.528.8649

Fax: 510.548.5738

Email: office@usenix.org

URL: <http://www.usenix.org>

Mailserver: email to info@usenix.org

The body of your email message should say: "send catalog".

T H A N K Y O U

USENIX and SAGE Thank Their Supporting Members

USENIX Supporting Members

Adobe Systems Inc.
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ISG Technologies
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Global Networking and Computing
Great Circle Associates
Online Staffing
Pencom Systems Inc.
Sprint Paranet
Taos Mountain
Texas Instruments, Inc.
TransQuest Technologies, Inc.

How to Join

Joining is easy. When you register, 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>.

Hotel Discount Reservation Deadline:

**Monday,
November 17,
1997**

Early Registration Discount Deadline:

**Friday,
November 21,
1997**

**For more
information,
please
contact us:**

USENIX

Conference Office

22672 Lambert Street,
Suite 613,
Lake Forest CA 92630

Phone: 714.588.8649

Fax: 714.588.9706

Email:

conference@usenix.org

URL:

<http://www.usenix.org>

Office hours:

8:30 am – 5:00 pm
Pacific Time

Hotel and Travel Information

Headquarters Hotel

USENIX has negotiated special rates for symposium attendees at the Monterey Marriott Hotel. Contact the hotel directly to make your reservation. Please mention USENIX to get the special rate. The hotel requires a one-night room deposit guaranteed to a major credit card.

Cancellation: You must notify the hotel no later than 6:00 pm on the day of your scheduled arrival.

Monterey Marriott

350 Calle Principal
Monterey, CA 93940

Toll Free: 800.228.9290

Local Telephone: 408.649.4234

Reservation Fax: 408.372.2968 ATTN: Reservations

Single/Double Occupancy \$99.00
(plus state and local taxes, currently at 10%)

► A limited number of government rate rooms are available with proper identification.

Note: Requests for hotel reservations made after the November 17 deadline will be made on a space-available basis only.

Travel to Monterey

Discount Airfares

Special airline discounts are available for USENIX attendees. You can fly to the San Francisco or Los Angeles International Airports and get a connecting flight to the Monterey Peninsula Airport.

JNR, Inc.

Toll Free in US and Canada: 800.343.4546

Telephone: 714.476.2788

Monterey Peninsula Airport and Taxi Service

The Monterey Peninsula Airport is located four miles from the Marriott Hotel. Taxi service costs approximately \$10–12 one way.

Driving to Monterey

From San Francisco/San Jose/Bay Area—Take Highway 101 South to Highway 156 West which turns into Highway 1. Exit at Del Monte Avenue/Pacific Grove. Continue on Del Monte to Calle Principal in Monterey. The hotel is located on the corner.

From Southern California—Take Highway 101 North to Highway 68 West to the Central Monterey turnoff to Highway 1 South. Take the first Monterey-Fisherman's Wharf exit straight and turn right on Camino Aguajito to Del Monte and turn left. Continue on Del Monte to Calle Principal in Monterey. The hotel is located on the corner.

Parking

Hotel parking is currently \$12/day.

Monterey Attractions

Monterey is justifiably famous for its rugged and scenic coastline, the Aquarium, and more. Some of the top attractions follow.

For detailed information including maps, visit:

http://city.net/countries/ united_states/california/monterey/

- Monterey Bay Aquarium
- Maritime Museum of Monterey and Stanton Center
- Pebble Beach and 17-Mile Drive
- Fisherman's Wharf and Cannery Row
- Point Lobos State Park

Registration Information

Tutorial Program Fees (December 8)

Tutorial registration fee includes:

- Admission to the tutorials you select
- Printed and bound tutorial materials for your selected courses
- Lunch

Early registration fee (until November 21)

Tutorial program for one day*	\$335
CEU credit for one full day	\$ 15

After November 21, add \$50 to the Tutorial fee

**NOTE: Select one AM and one PM tutorial. Sorry, no half-day registration allowed.*

Technical Program Fees (December 9–11)

Technical Program registration fee includes:

- Admission to all technical sessions
- Copy of conference proceedings
- Admission to the symposium Luncheon and Reception

Early registration fee (until November 21)

Member*	\$355
Non-member**	\$425
Full-time student	\$ 75

(copy of student ID required)

Members and Non-members: After November 21, add \$50 to the Technical Program fee

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

***Join USENIX or renew your membership. Pay the non-member technical program fee and just check the USENIX membership box on the registration form to renew your existing membership or receive a one-year individual association membership.*

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

REFUND / CANCELLATION POLICY

If you must cancel, all refund requests must be in writing with your signature, and postmarked no later than December 1, 1997. Telephone and email cancellations cannot be accepted. You may fax your cancellation or substitute another in your place. Call the Conference Office for details: 714.588.8649.

Copy this form as needed. Type or print clearly.

Registration Form

Symposium on Internet Technologies and Systems December 8-11, 1997

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

() ()

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