Fifth Tcl/Tk Workshop

The Only Conference by and for Tcl/Tk Users and Developers

July 14–17, 1997
Tremont House Hotel
Boston, Massachusetts

Sponsored by the USENIX Association

Keynote

Experience with Tcl/Tk and some Alternatives
Brian Kernighan, *Bell Laboratories*

Tutorials on These Topics:

See pages 4–6

- **Effective Tcl/Tk Programming**
- **Database Programming with Tcl/Tk**
- **TclProp and OAT**
- **Building Multi-User Applications with GroupKit**

Technical Presentations:

- **Applications**
- **Implementation**
- **Programming Models**
- **Multimedia and Graphics**
- **Development**

Tcl/Tk Update

John Ousterhout

> "The Tcl/Tk Workshop provides a unique opportunity to find out why Tcl is becoming the premier scripting language for Web/Internet applications. Come hear about the latest Tcl/Tk developments and talk to the wizards who are driving the Tcl revolution!"
>
> John Ousterhout,
> Distinguished Engineer,
> *Sun Microsystems*

USENIX

Welcome to the Fifth Annual Tcl/Tk Workshop!

Joseph A. Konstan

Brent Welch

Dear Workshop Attendee:

Like us, you are probably overwhelmed by the sheer volume of new developments surrounding Tcl and Tk. As we prepare for this year's Tcl/Tk workshop, we are amazed by the quantity and quality of research and development of interest to Tcl/Tk users, developers, and extenders. The best way to keep current on all of these developments is to attend the Fifth Annual Tcl/Tk Workshop, sponsored by the USENIX Association.

The workshop addresses research and development related to Tcl and Tk. Presentations range from technical details of compiler or namespace implementation to interesting and novel extensions, to experience reports from innovative and challenging applications. In addition to formal presentations, Birds-of-a-Feather sessions (BOFs) and Work-In-Progress reports (WIPs) give all attendees an opportunity to share their experiences and influence the future directions of Tcl and Tk.

This year's workshop includes a full day of tutorials on a range of topics including effective Tcl/Tk programming, building database support into Tcl/Tk applications, building groupware applications in Tcl/Tk, and using declarative programming to simplify Tcl/Tk application development. Plenary sessions include an opening keynote address by Brian Kernighan and an update on Tcl/Tk with creator and champion John Ousterhout. In between, the collection of papers, posters, panels, and informal sessions will provide a range of opportunities for learning about and influencing the future of Tcl and Tk.

Whether you are an experienced Tcl/Tk developer, or are interested in evaluating Tcl/Tk for future use, the Fifth Annual Tcl/Tk Workshop is an event you won't want to miss.

We look forward to seeing you in July.

Joseph A. Konstan, *University of Minnesota*
Program Co-Chair

Brent Welch, *Sun Microsystems Laboratories, Inc.*
Program Co-Chair

PS: Remember to sign up for tutorials early. See pages 4 to 6 for more information.

Table of Contents

Conference Organizers

Program Co-Chairs
Joseph A. Konstan, *University of Minnesota*
Brent Welch, *Sun Microsystems Laboratories, Inc.*

Program Committee
Dave Beazley, *University of Utah*
Mark Harrison, *DSC Communications Corporation*
Jeffrey Hobbs, *University of Oregon*
George Howlett, *Bell Labs Innovations for Lucent Technologies*
Ray Johnson, *Sun Microsystems Laboratories, Inc.*
Kevin Kenny, *General Electric Corporate R & D*
Gerald Lester, *Computerized Processes Unlimited, Inc.*
Don Libes, *NIST*
John Robert LoVerso, *Open Group Research Institute*
Michael J. McLennan, *Bell Labs Innovations for Lucent Technologies*
Brian C. Smith, *Cornell University*

Program at a Glance

Sunday, July 13, 1997

On-Site Registration	6:00 pm – 9:00 pm

Monday, July 14

On-Site Registration	7:30 am – 5:00 pm
AM Tutorial Program	9:00 am – 12:30 pm
Tutorial Luncheon	12:30 pm – 1:30 pm
PM Tutorial Program	1:30 pm – 5:00 pm

Tuesday, July 15

On-Site Registration	7:30 am – 5:00 pm
Keynote Address & Technical Program	9:00 am – 6:00 pm
Workshop Dinner	7:00 pm – 9:00 pm
Birds-of-a-Feather Sessions	9:00 pm – 11:00 pm

Wednesday, July 16

On-Site Registration	7:30 am – 5:00 pm
Technical Program	9:00 am – 6:00 pm
Workshop Luncheon	12:15 pm – 2:15 pm
Poster Session / Informal Demonstrations	6:00 pm – 8:00 pm
Birds-of-a-Feather Sessions	7:00 pm – 10:00 pm

Thursday, July 17

Technical Program	9:00 am – 12:15 pm
Town Meeting	12:15 pm – 12:45 pm

Workshop Information

Discounts and Student Stipends

The USENIX student stipend program covers travel, living expenses, and registration fees to enable full-time students to attend USENIX conferences and workshops. To apply for a stipend, visit the USENIX Web site: *http://www.usenix.org,* read *comp.org.usenix,* or send email to *students@usenix.org.*

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

Conference Proceedings

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

Birds-of-a-Feather Sessions (BoFs)
Tuesday and Wednesday evenings, July 15 and 16

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 Sessions (WIPs)
Tuesday and Wednesday, July 15 and 16

Do you have a Work-In-Progress that would be of interest to the Tcl/Tk community? We invite you to briefly present your work at one of the WIP sessions which will take place during the Technical Program. Sign up at the registration desk on-site. An overhead projector will be available.

Commercial Product Demonstrations
Tuesday afternoon, July 15

Do you have a commercial product related to Tcl/Tk? We invite authors and vendors of Tcl/Tk development tools, Tcl/Tk-based commercial applications, soon-to-be-released applications, and Tcl/Tk-related books to briefly present their products on Tuesday afternoon. Contact the program co-chairs with email to *tclchairs@usenix.org* to reserve a slot before the conference, or sign up at the registration desk.

Informal Demonstrations
Wednesday evening, July 16

Attendees are invited to demonstrate Tcl/Tk-related software informally during the Poster Session Wednesday evening, and during conference breaks. We regret that we must ask you to supply your own equipment.

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

Technology is changing more rapidly than ever before. No matter what your special expertise is, you are expected to stay on top of the latest improvements *and* do your job. Sign up for tutorials and you will get an immediate payoff from gaining command of the newest developments, and putting them to work immediately.

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

Continuing Education Units

USENIX provides Continuing Education Units (CEUs) for a small additional administrative fee. The CEU is a nationally recognized standard of unit of measure for continuing education and training, and is used by thousands of organizations. Each half-day USENIX tutorial qualifies for 0.3 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.*

Tutorial Overview

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 half-day registrations.

Monday, July 14

Morning Session: 9:00 am – 12:30 pm

M1AM Effective Tcl/Tk Programming
Michael J. McLennan, *Lucent Technologies, Inc.* and Mark Harrison, *DSC Communications Corp.*

M2AM Building Multi-User Applications with GroupKit
Mark Roseman, *TeamWave Software* and *University of Calgary*

Afternoon Session: 1:30 pm – 5:00 pm

M3PM Database Programming with Tcl/Tk
Tom Poindexter, *Talus Technologies, Inc.*

M4PM TclProp and OAT: Tools for Declarative Programming
Joseph A. Konstan and Alex Safonov, *University of Minnesota*

For more workshop 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

M1AM Effective Tcl/Tk Programming

Michael J. McLennan, *Lucent Technologies, Inc.* and Mark Harrison, *DSC Communications Corp.*

Who should attend: Programmers and managers using Tcl/Tk to build real-world applications. You should have a working knowledge of Tcl/Tk.

What you will learn: How non-trivial Tcl/Tk programs are put together; system architectures and coding techniques that make Tcl/Tk applications easier to develop and maintain.

Tcl/Tk programming is deceptively simple. You can put together a "Hello, World!" program with just a few lines of code. But when you start to develop serious applications that require a few thousand lines of code, things can get out of hand.

This tutorial draws upon the lessons learned from writing thousands of lines of Tcl/Tk code. It describes design paradigms and coding techniques that make it easier to build Tcl/Tk applications. Topics include:

- How to handle data structures in Tcl
- How to package Tcl/Tk code into reusable libraries
- How to communicate with other processes
- How to implement client/server architectures
- How to use "safe" interpreters
- How to deliver Tcl/Tk applications that are easy to configure and install

More than anything else, you will learn techniques that will help make your Tcl/Tk projects a success.

Michael McLennan *has been a Tcl/Tk enthusiast since 1992 and has taught more than 40 courses on Tcl/Tk. He is co-author of* Effective Tcl/Tk Programming *and* Tcl/Tk Tools. *He also developed [incr Tcl], an object-oriented extension of Tcl/Tk, and many other extensions and applications, including the cover application for John Ousterhout's book,* Tcl and the Tk Toolkit. *He is currently a Distinguished Member of Technical Staff at Bell Labs Innovations for Lucent Technologies, Inc.*

Michael McLennan

Mark Harrison *heard John Ousterhout speak at the Winter 1991 USENIX Conference and wrote his first Tk program during the next speaker's presentation. He is co-author of* EffectiveTcl/Tk Programming *and editor of* Tcl/Tk Tools. *His first book,* The Usenet Handbook, *was selected by* UNIX Review *as one of the best books of 1995. He is currently a senior architect for intelligent network systems at DSC Communications Corporation. When pressed, he modestly admits to being the world's most enthusiastic Tcl programmer.*

Mark Harrison

M2AM Building Multi-User Applications with GroupKit

Mark Roseman, *TeamWave Software* and *University of Calgary*

Who should attend: Tcl/Tk programmers interested in multi-user applications (groupware) and how to quickly build them using GroupKit. No prior experience with groupware is assumed, but you do need to know how to program in Tcl/Tk.

What you will learn: You will gain exposure to GroupKit, a Tcl/Tk extension for building multi-user applications, such as shared whiteboards, meeting tools, and network games.

This tutorial introduces GroupKit, a Tcl/Tk extension used in the groupware community. Besides letting you build stand-alone groupware applications, its API is used to create applets for the TeamWave Workplace system.

Groupware is a novel and fun application domain that is gaining popularity, and Tcl/Tk is particularly well-suited to building groupware. GroupKit can let you easily take your single-user programs and turn them into groupware. Topics include:

- An introduction to groupware applications and concepts
- A walk-through of a simple GroupKit application
- GroupKit primitives: remote procedures, events, environments
- Groupware-specific user interface widgets
- Issues in groupware usability

Mark Roseman *is founder and president of TeamWave Software, Ltd., which develops TeamWave Workplace, a cross-platform Internet groupware environment based on Tcl/Tk. He is also the creator of GroupKit, developed at the University of Calgary.*

Mark Roseman

M3PM Database Programming with Tcl/Tk

Tom Poindexter, *Talus Technologies, Inc.*

Who should attend: Programmers planning to develop database applications in Tcl/Tk. You should have a working knowledge of Tcl/Tk. Experience with SQL and database systems is helpful, but not required.

What you will learn: How to build database applications in Tcl/Tk by utilizing database extensions.

The Tcl database extensions Sybtcl and Oratcl (representing extensions to two of the most popular relational databases from Sybase and Oracle) are explored in detail, from simple query/insert/update/delete to using advanced features such as executing stored procedures and BLOBs (Binary Large Objects.) Other topics include:

- Requirements for using Tcl database extensions
- Dealing with error situations and server feedback
- Accessing meta data, data about result sets
- Transaction semantics
- Common Tcl/Tk programming patterns
- Database administration scripts
- Using Sybtcl/Oratcl sample programs, Wisqlite and Wosql
- Compiling and building the Sybtcl/Oratcl extensions
- Review of other Tcl database extensions

Tom Poindexter

Tom Poindexter *has authored and maintains the Sybtcl and Oratcl Tcl database extensions. He has been developing Tcl-based database applications for telecommunications clients since 1992, and has over 18 years experience in software design and programming. He is also a contributing author of* Tcl/Tk Tools, *an upcoming O'Reilly & Associates publication. When not hiking or skiing, Tom writes robot simulation games in C and Tcl. He is president of Talus Technologies, Inc., a software consulting company.*

M4PM TclProp and OAT: Tools for Declarative Programming

Joseph A. Konstan and Alex Safonov, *University of Minnesota*

Who should attend: Software developers with experience implementing graphical user interfaces, either in Tk or another high-level toolkit. No prior experience with declarative programming is assumed.

What you will learn: How to simplify the implementation of complex interfaces by using declarative programming techniques.

This tutorial introduces TclProp and OAT, tools that Tcl/Tk developers can use to support declarative programming. Declarative programming is a technique in which programmers specify *what* they want to happen rather than *how* they want it to happen. The resultant programs are easier to understand, modify, and maintain. For example, using TclProp and OAT, a programmer can specify when buttons and menu items are active or inactive. Similarly, it is possible to implement constraints among canvas items to ensure proper size and layout.
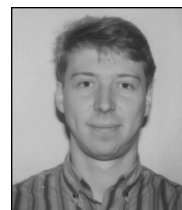
You will learn from complete, practical examples that illustrate the use of declarative programming. Real-world exercises ensure that you can start using TclProp and OAT right away.

After completing this tutorial, you will be able to identify applications that can be simplified by using declarative programming; use TclProp to enforce relationships among application values; and use OAT to extend declarative programming into Tk widgets, canvas items, and their own objects.

Joseph A. Konstan

Joseph A. Konstan *has spent over nine years researching issues in user interface programming, including declarative programming. He is an award-winning instructor whose industrial short courses and conference tutorials have been well-received by students of all backgrounds. He is an assistant professor of computer science.*

Alex Safonov

Alex Safonov's *research on advanced scientific visualization led him to explore declarative programming, and he is the creator of the OAT trace extension and the latest version of TclProp. Alex has lectured on declarative programming and is a recipient of the Best Paper award from the Fourth Annual Tcl/Tk Workshop. He is a PhD candidate at the University of Minnesota.*

USENIX Membership Information

USENIX is the UNIX and Advanced Computing Systems Association

Since 1975, USENIX has brought together the community of developers, 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 sessions at all USENIX conferences and symposia
- PGP Key signing service (available at most conferences)
- Special subscription rates to the periodicals *Linux Journal, UniForum Monthly, UniNews,* and the annual *UniForum Open Systems Products Directory*
- Savings on selected titles from John Wiley & Sons, McGraw-Hill, MIT Press, Morgan Kaufmann, Nolo Press, O'Reilly & Associates, Prentice Hall, Sage Science Press, and UniForum
- Discount on all publications and software from Prime Time Freeware
- 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
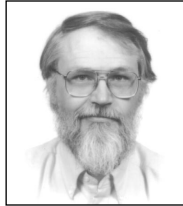### USENIX and SAGE Thank Their Supporting Members

USENIX Supporting Members

Adobe Systems Inc.

Advanced Resource

ANDATACO

Andrew Consortium

Apunix Computer Services

Boeing Commercial

Crosswind Technologies, Inc.

Earthlink Network, Inc.

ISG Technologies, Inc.

Matsushita Electric Industrial

Motorola Research & Development

MTI Technology Corporation

Sybase, Inc.

Tandem Computers, Inc.

UUNET Technologies, Inc.

SAGE Supporting Members

Atlantic Systems Group

Bluestone, Inc.

Enterprise Systems Management Corp.

Great Circle Associates

Online Staffing

Paranet, Inc.

Pencom Systems Administration/PSA

Southwestern Bell

Taos Mountain

TransQuest Technologies, Inc.

TUESDAY, July 15

9:00am – 10:30am

Opening Remarks / Best Paper Awards
Joseph A. Konstan, *University of Minnesota* and
Brent Welch, *Sun Microsystems Laboratories*

Keynote
Experience with Tcl/Tk and Some Alternatives
Brian Kernighan, *Bell Laboratories*

There are really only two problems in computing: machines are too hard to use, and they are too hard to program. People who build graphical user interfaces get to share the pain on both of these accounts.

During the past five years, I have worked on nearly a dozen graphical user interface projects, building a variety of interfaces with both mainstream and unknown tools, and in several cases creating versions of the same interface with alternative tools.

Although it is not perfect, Tcl/Tk remains my personal favorite, the tool of choice for such programming. In this talk, I will discuss experiences with Tcl/Tk and alternatives, and illustrate some things that work well and a few that don't. I will also attempt to draw some lessons for designers of languages, systems, and user interfaces.

Brian Kernighan is the head of the Computing Structures Research Department at Bell Laboratories where his current research activities are in user interfaces and application-oriented programming languages. He has worked in the areas of combinatorial optimization, design automation, document preparation, and programming languages. He is the co-author of several computer science books, including The Elements of Programming Style, Software Tools, *and* The C Programming Language. *Brian received his PhD from Princeton.*

10:30am – 11:00am   **Break**

11:00am – 12:15pm   Applications 1

> **Tcl in AltaVista Forum**
> David Griffin, *AltaVista Internet Software Inc.*
>
> **Dashboard: A Knowledge-Based Real-Time Control Panel**
> De Clarke, *UCO/Lick Observatory, UCSC*
>
> **Caubweb: Detaching the Web with Tcl**
> John Robert LoVerso and Murray S. Mazer, *Open Group Research Institute*

12:15pm – 2:15pm   **Lunch (on your own)**

2:15pm – 3:30pm   Implementation Issues

> **Jacl: A Tcl Implementation in Java**
> Ioi K. Lam and Brian C. Smith, *Cornell University*
>
> **A Typing System for an Optimizing Multiple-Backend Tcl Compiler**
> Forest Rouse and Wayne Christopher, *IECM CFD Engineering*
>
> **TclOSAScript—Exec for the Mac**
> Jim Ingham, *Lucent Technologies* and Raymond Johnson, *Sun Microsystems*

3:30pm – 4:15pm   **Break**

4:15pm – 5:10pm   Retrospective

> **Redesigning Tcl-DP**
> Mike Perham, Brian C. Smith, Tibor Janosi, and Ioi K. Lam, *Cornell University*
>
> **Writing a Tcl Extension in Only Seven Years**
> Don Libes, *NIST*

5:10pm – 6:00pm   Works-In-Progress / Product Demonstrations

7:00pm – 9:00pm   **Workshop Dinner**

WEDNESDAY, July 16

9:00am – 10:15am

Tcl Programming Models

Simple Multilingual Support for Tcl
Henry Spencer, *SP Systems*

Assertions for the Tcl Language
Jonathan Cook, *New Mexico State University*

Extending Traces with OAT: An Object Attribute Trace Package For Tcl/Tk
Alex Safonov, Joseph A. Konstan, John V. Carlis and Brian Bailey, *University of Minnesota*

10:15am – 10:45 am   **Break**

10:45am – 12:15pm

Sun Tcl/Tk Update
John Ousterhout, *Sun Microsystems Laboratories*

John Ousterhout will provide an update on the Tcl/Tk work going on at Sun Microsystems, including developments over the last year and plans for the next year or two. As usual, he will collect audience input on how Tcl and Tk should evolve. John will also describe the new Sun business group that will be selling Tcl tools, applications, and support.

12:15pm – 2:15pm   **Workshop Lunch**

2:15pm – 3:30pm

Multimedia and Graphics

A Tk OpenGL Widget
Claudio Esperanca, *Universidade Federal do Rio de Janeiro, Cidade Universitaria*

The ImageTcl Multimedia Algorithm Development System
Charles B. Owen, *The Dartmouth Experimental Visualization Laboratory*

Nsync—A Constraint Based Toolkit for Multimedia
Brian Bailey and Joseph A. Konstan, *University of Minnesota*

3:30pm – 4:15pm   **Break**

4:15pm – 5:05pm

Development

Managing Tcl's Namespaces Collaboratively
Don Libes, *NIST*

PtTcl: Using Tcl with Pthreads
D. Richard Hipp, *Hwaci Corporation*

5:10pm – 6:00pm   **Works-In-Progress**

THURSDAY, July 17

9:00am – 10:30am

Panel: Tcl/Tk—Taking Over the World or Fading Into Oblivion?
Panel Organizer: Michael J. McLennan, *Bell Labs Innovations for Lucent Technologies*

Tcl/Tk is at a crossroads. Down one path is incredible success fueled by cross-platform support, a Web plug-in, and a byte code compiler. Down the other is obsolescence, where things like Java and VBscript will take its place. How do we get Tcl/Tk to move forward? What will it take to achieve success?

10:30am – 11:00am   **Break**

11:00am – 12:15pm

Applications 2

A Tcl-Based Self-Configuring Embedded System Debugger
Dale E. Parson, Paul Beatty, and Bryan Schlieder, *Bell Labs Innovations for Lucent Technologies*

GeNMSim, The Agent Simulator
Udi Margolin, Ilana Gani-Naor, and Raz Rafaeli, *Milestone Software & Systems, Ltd.*

The Tycho User Interface System
Christopher Hylands, Edward A. Lee, H. John Reekie, *University of California, Berkeley*

12:15pm – 12:45pm

Closing Remarks and Town Meeting

The Tcl/Tk Workshop Technical Program is organized by a volunteer committee. The town meeting is an opportunity to provide feedback on the workshop, to suggest ideas for next year's workshop, and to volunteer to help organize future workshops.

Registration Information

Tutorial Program Fees (July 14)

Early registration fee (until June 27)

Tutorial program*	$335
CEU credit	$ 15

After June 27, add $50 to the Tutorial fee

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

Tutorial registration fee includes:
- Admission to the tutorials you select
- Printed and bound tutorial materials for your selected courses
- Lunch

Technical Sessions Fees (July 15–17)

Early registration fee (until June 27)

Member*	$340
Non-member**	$410

Members and Non-members: After June 27, add $50 to the Technical Sessions fee

Full-time student	$ 75
(copy of student ID required)	

* 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 sessions 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.

Technical Sessions registration fee includes:
- Admission to all Technical Sessions
- Copy of workshop proceedings
- Admission to the workshop Luncheon and Dinner

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 July 2, 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.

Have a Question?

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

Hotel Discount Reservation Deadline: *Thursday, June 19, 1997*

USENIX has negotiated special rates for workshop attendees at the Tremont House Hotel. Contact the hotel directly to make your reservation. Please mention USENIX to get the special rate. A one-night room deposit must be guaranteed on a major credit card. To cancel your reservation, you must notify the hotel at least 24 hours before your planned arrival date.

Tremont House Hotel
275 Tremont Street
Boston, Massachusetts 02116-5694
Toll Free: 800.331.9998
Local Telephone: 617.426.1400
Reservation Fax: 617.482.6730

Single/Double Occupancy $125.00
(*plus state and local taxes, currently at 9.7%*)
  Note: Requests for hotel reservations made after the deadline will be made on a space- and rate-available basis only.

Discount Airfares
  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
  Logan International Airport is approximately three miles from the hotel. City Transportation provides daily shuttle service every 30 minutes from 6:30 am until 10:30 pm to the Tremont House Hotel and other downtown hotels. Catch the shuttle outside the baggage claim area at the island with signs for "Greater Boston Hotels". It currently costs $7.50 one way. Reservations are not required. Taxi service is approximately $14.

Parking/Local Transportation
  Boston parking is scarce and expensive; currently the Tremont is charging $20/day. Consider using the "T", Boston's subway. It links all sections of the city and nearby communities. The fare is just $.85 one way and it runs from 5:00 am to 12:45 am. The New England Medical Center Stop on the Orange Line is just across the street from the Tremont House Hotel and the Boylston Street Stop on the Green Line is 2 blocks north.

Points of Interest
  Founded over 350 years ago, Boston has a rich tradition of education, history, arts, and high technology. Boston is an historical city with diverse and interesting attractions including:
- **Faneuil Hall/Quincy Market**
- **Museums:** Boston Computer Museum, Museum of Fine Arts, Museum of Science, MIT Museum, JFK Library and Museum, Isabella Stuart Gardner Museum, and the Children's Museum.
- **Historic Sites:** Freedom Trail, Paul Revere House, Boston Red Sox/Fenway Park
- **New England Aquarium**

Registration Form
Fifth Tcl/Tk Workshop, July 14–17, 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
(   )   (   )
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 for other than 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

What publications or newsgroups do you read related to Tcl/Tk?

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

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

Monday, July 14, 1997
- ❏ M1AM   Effective Tcl/Tk Programming
- ❏ M2AM   Building Multi-User Applications with GroupKit

- ❏ M3PM   Database Programming with Tcl/Tk
- ❏ M4PM   TclProp and OAT: Tools for Declarative Programming

> **REFUND/CANCELLATION POLICY** If you must cancel, all refund requests must be in writing with your signature, and postmarked no later than July 2, 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.

Tutorial Program Fees   (Monday, July 14)

Tutorial program for one day................................. $335.00 $_____
   CEU credit (optional), see pg. 4 .... $15.00 $_____
Late fee applies if postmarked after
Friday, June 27, 1997.................................... Add $50.00 $_____

Technical Session Fees   (Tuesday–Thursday, July 15–17)

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

Non-member fee* .... $410.00 $_____
*****Join or renew your USENIX membership, AND attend the conference for the same low price.**   Check here: ❏

Late fee applies if postmarked after
Friday, June 27, 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   **$_____**

You may fax your registration form to 714.588.9706 if paying by credit card. To avoid duplicate billing, please do not mail an additional copy.

> **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

USENIX®

Sign up now for best tutorial selection. See pages 4–6.

Hotel Discount Deadline: June 19

Register by June 27 and Save $100

Fifth Tcl/Tk Workshop

The Only Conference by and for Tcl/Tk Users and Developers

July 14–17, 1997
Tremont House Hotel
Boston, Massachusetts

4 Easy Ways for More Information:

1. Phone: 714.588.8649
2. Fax: 714.588.9706
3. Email: *conference@usenix.org*
4. URL: *http://www.usenix.org*

USENIX Conference Office
22672 Lambert Street, Suite 613
Lake Forest, CA 92630
Office Hours: M–F, 8:30 am–5:00 pm, Pacific Time

Please pass this along to a colleague.