The USENIX Association Newsletter

Volume 16, Number 6  November/December 1991

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The closing date for submissions for the next issue of ;login: is December 20, 1991.
The USENIX Association is a not-for-profit organization of those interested in UNIX® and UNIX-like systems. It is dedicated to fostering and communicating the development of research and technological information and ideas pertaining to advanced computing systems, to the monitoring and encouragement of continuing innovation in advanced computing environments, and to the provision of a forum where technical issues are aired and critical thought exercised so that its members can remain current and vital.

The officers of the Association are:

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Vice-President Michael D. O’Dell<br> mo@usenix.org
Secretary Rob Kolstad<br> kolstad@usenix.org
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Executive Director Ellie Young<br> ellie@usenix.org

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Daniel V. Klein, Tutorial Coordinator<br> (412) 421-2332<br> dVk@usenix.org

Contributions Solicited

Members of the UNIX community are encouraged to contribute articles to ;login:. Contributions may be sent electronically to login@usenix.org or through the U.S. mail to the Association office. The USENIX Association reserves the right to edit submitted material.

UUNET Subscriptions

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1992 Elections for Board of Directors

The biennial elections of the Association will be held in the Spring of 1992.

Nominations from the membership are open until January 31, 1992. The procedure for nominations by the membership is a written statement of nomination signed by at least five (5) members in good standing (or five separate nominations), to be submitted to the Executive Director at the Association office, and received by noon, PST, January 31, 1992. Please include a Candidate’s Statement and photograph for inclusion with the ballots as well.

Ballots will be sent to all paid-up members as of February 21, on or about February 26. Members will have until March 20 to return their ballots, in the envelopes provided, to the Association office. The results of the election will be announced at the San Antonio Conference and in the May/June issue of ;login:.

The Board is made up of eight directors, four of whom are “at large.” The others are the President, Vice President, Secretary, and Treasurer. The balloting is preferential, with those candidates with the largest number of votes being elected. Newly elected directors will take office immediately following the conclusion of the Annual Meeting of the Association which will be held in June at the San Antonio Conference.

Report of the Nominating Committee

The Nominating Committee (Peter H. Salus, chair; Marc D. Donner, Andrew Hume, Charles Sauer, Elizabeth Zwicky) under the By-Laws of the Association, is charged with ensuring that there is at least one candidate for each of the four officer posts on the Board of Directors and at least four candidates for the four At-Large seats. We are very pleased that such a large number of nominees stepped forward. Each of the following nominees has indicated her/his willingness to serve. The By-Laws further permit nominations by petition. Such nominations must be submitted in a form as described above.

The Committee nominates the following:
President: Steven C. Johnson, Athenix
Vice President: Michael D. O'Dell, Bellcore

Treasurer:
Rick Adams, UUNET Technologies
Ed Gould, Digital Equipment Corporation
Secretary: Evi Nemeth, University of Colorado

At-Large:
Eric Allman, University of California, Berkeley
Nawaf Bitar, Kubota
Tom Christiansen, Convex
Daniel Geer, Geer/Zolot Associates
Lori Grob, Chorus Systems
Trent Hein, XOR
Sonya Neufer, Canstar
Greg Rose, IBM Research
Barry Shein, Software Tool and Die
Melinda Shore, Cornell University

November/December 1991
USENIX Winter 1992 Technical Conference
San Francisco, California, January 20–24, 1992

Tutorial Program

Monday, January 20
Introductory Topics in Systems Administration
Evi Nemeth, University of Colorado and Rob Kolstad, SunSoft Inc.
Distributed File System Administration With AFS and DCE DFS
Linda Walmer and Phil Hirsch, Transarc Corporation
Network Security: The Kerberos Approach
Dan Geer, The Vision Thing, Inc. and Jon A. Rochlis, MIT
Device Driver Design
Clement Cole, Locus Computing Corp.
OSF/1 Internals
Thomas W. Doeppner, Jr., Brown University
System V Release 4.0 Internals:
Part 1 - Virtual Memory and File Systems
Mike Scheer, ProLogic and Steve Buroff, AT&T
Beyond Xt: Developing and Debugging X-based Applications
Oliver Jones, PictureTel Corporation
An Introduction to C
Carol Meier, XVT Software
The Internet and its Protocols
William LeFebvre, Northwestern University
Parallel Programming and Scalable Software
Stephen C. Johnson, Athenix
Programming in Perl
Tom Christiansen, Convex Computer Corporation

Tuesday, January 21
Advanced Topics in Systems Administration ’92
Rob Kolstad, SunSoft, Inc. and Trent Hein, XOR Computer Systems
Writing Portable Applications Using the POSIX.1 Standard
Donald Lewine, Data General Corp.
An Introduction to UNIX System Security
Matt Bishop, Dartmouth College
UNIX Network Programming
Richard Stevens, Consultant

4.4BSD Preview: Kernel Internals
Marshall Kirk McKusick and Michael J. Karels, University of California, Berkeley
System V Release 4.0 Internals: Part 2 - Selected Topics
Steve Buroff, AT&T and Mike Scheer, Pro-Logic
Advanced Motif Programming
Dan Heller, Z-Code Software
An Introduction To C++
Robert Murray, AT&T Bell Labs
UNIX Programming Tools
Kenneth Ingham, Consultant
Computer Software Law: Knowing Your Rights
Daniel Appelman, Heller, Ehrman, White and McAuliffe

Preliminary Technical Program

Wednesday, January 22
8:30–10:00 Keynote Address
Building the Open Road: The Internet as a Testbed for the National Public Network
Mitch Kapor, Electronic Frontier Foundation

10:30–12:00 Libraries
COLA: Customized Overlaying
Eduardo Krell and Balachander Krishnamurthy, AT&T Bell Laboratories, Murray Hill
LIBTP: Portable, Modular Transactions for UNIX
Margo Seltzer and Michael Olson, University of California, Berkeley
Exploiting the Advantages of Mapped Files for Stream I/O
Orran Krieger, Michael Stumm, and Ron Unrau, University of Toronto
Invited Talk: A Technical Overview of Open Look
Fred Horman, UNIX System Laboratories, Inc.

1:30–3:00 File System Implementations
The Episode File System
Sailesh Chutani, Owen T. Anderson, Michael...
An Implementation of Large Files for BSD UNIX
Dave Shaver, Eric Schnoebelen, and George Bier, CONVEX Computer Corp.

Storage Efficient Reliable Files
Walt Burkhard and Petar D. Stojadinovic, University of California, San Diego

Invited Talk: TeX in the UNIX Environment, Anthony Starks, Merck & Co.

3:30–5:00 Innovative Applications
Multimedia Mail From the Bottom Up -or- Teaching Dumb Mailers to Sing
Nathaniel S. Borenstein, Bellcore

archie - An Electronic Directory Service for the Internet
Alan Emtage and Peter Deutsch, McGill University

X Widget Based Software Tools for UNIX
Doug Blewett, Scott Anderson, Meg Kilduff, and Mike Wish, AT&T Bell Laboratories, Murray Hill

Panel Session: Intellectual Property: Who Should Own Your Work?

Invited Talk: Can UNIX Designers Learn Anything from PCs?
Marc J. Rochkind, XVT Software

Thursday, January 23
8:30–10:00 Practical Points
Purify: A Tool for Detecting Memory Leaks and Access Errors in C and C++ Programs
Reed Hastings and Bob Joyce, Pure Software

Creating MANs using LAN Technology: Sometimes You Gotta Break the Rules
Stanley P. Hanks, Technology Transfer Associates

Realtime Workstation Performance for MIDI
Robin Schaufler, Silicon Graphics, Inc.

Invited Talk: Portability in the 90s
Morven Gentleman, Institute for Information Technology, NRC of Canada

10:30–12:00 Hacking and Cracking
agrep - A Fast Approximate Pattern-Matching Tool
Sun Wu and Udi Manber, University of Arizona, Tucson

An Evening with Berferd in Which a Cracker is Lured, Endured, and Studied
Bill Cheswick, AT&T Bell Laboratories, Murray Hill

Hijacking AFS
P. Honeyman, L.B. Huston, and M.T. Stolarchuk, The University of Michigan, Center for Information Technology Integration

Invited Talk: Tcl and Tk
John Ousterhout, University of California, Berkeley

1:30–3:00 UNIX Meets the Real World
An Information Bus Architecture for Large-Scale, Decision-Support Environments
Dale Skeen, Teknekron Software Systems, Inc.

Application Software: Project Management and Privileges
Bernard Wagner, Ciba-Geigy AG and Bruce K. Haddon, Storage Technology Corporation

Applying Threads
Jay Littman, Hewlett-Packard

Invited Talk: Standards Without Putting You to Sleep
Jeff Haemer, Interactive Systems Corporation

3:30–5:00 Hardware Issues
Open Boot Firmware
Mitch Bradley, Sun Microsystems Computer Corporation

Loge: A Self-Organizing Disk Controller
Robert M. English and Alexander A. Stepanov, Hewlett-Packard Laboratories

How and Why SCSI is Better Than IPI for NFS
Bruce Nelson and Yu-Ping Cheng, Auspex Systems

Invited Talk: A Technical Overview of DCE
Jennifer G. Steiner, Open Software Foundation

Work-in-Progress Reports

Friday, January 24
8:30–10:00 Load Balancing
Process Control and Communication in Distributed CAD Environments
Supporting Checkpointing and Process Migration Outside the UNIX Kernel
Michael Litzkow and Marvin Solomon, University of Wisconsin, Madison

The OpenSim Approach - Tools for Management and Analysis of Simulation Jobs
Matt W. Mutka and Philip K. McKinley, Michigan State University, East Lansing

Invited Talk: System Administration Discussion, Rob Kolstad, SunSoft, Inc.

10:30–12:00 FileSystem Performance
Multi-level Caching in Distributed File Systems
D. Muntz and P. Honeyman, The University of Michigan, Center for Information Technology Integration

A Trace-Driven Analysis of Name and Attribute Caching in a Distributed System
Ken Shirriff and John K. Ousterhout, University of California, Berkeley

NFS Tracing by Passive Network Monitoring
Matt Blaze, Princeton University

Invited Talk: Open Systems and System Administration
Martin Kirk, X/Open Co. Ltd.

1:30–3:00 Scheduling
Issues in Implementation of Cache-Affinity Scheduling
Murthy Devarakonda and Arup Mukherjee, IBM Thomas J. Watson Research Center

Control Considerations for CPU Scheduling in UNIX Systems
Joseph L. Hellerstein, IBM Research, Yorktown Heights

Realtime Scheduling in SunOS 5.0
Sandeep Khanna, Michael Sebré, and John Zolnowsky, SunSoft, Inc.

Invited Panel: Hints and Kinks for the UNIX Professional

3:30–5:00 Off the Beaten Track
Camels and Needles: Computer Poetry Meets the Perl Programming Language
Sharon Hopkins

3DFS: A Time-Oriented File Server
William D. Roome, AT&T Bell Laboratories, Murray Hill

Faster String Functions
Henry Spencer, University of Toronto

Alan E. Kaplan, AT&T Bell Laboratories, Murray Hill

To receive a registration booklet and for additional information, please contact the Conference Office.
Call For Papers and Pre-Announcement
USENIX Summer 1992 Technical Conference
San Antonio, Texas, June 8 - 12, 1992

Computer networking and communications will play a dominant role in the evolution of computing over the next several years. Yet the field is just entering its adolescence.

Congress has budgeted $92 million for the National Research and Education Network for 1992 alone. Many companies are selling international TCP/IP networking services on a commercial basis. FDDI is becoming economical for widespread use. Research is being conducted on gigabit-speed wide-area networks.

What are we going to do with all this bandwidth? More importantly, how are we going to manage it?

The USENIX 1992 Summer Conference solicits new work on all topics related to UNIX or UNIX-inspired programming and technologies. We are interested in innovation in all areas, in addition to networking and communications.

Submissions

Please target a sophisticated technical audience particularly knowledgeable of operating system issues yet keenly interested in new and exciting projects in many areas.

Vendors are encouraged to submit technical presentations on products. However, we will reject obvious product announcements. Previously published papers will also be rejected, although retrospective papers may describe work done years ago.

Submissions must be in the form of extended abstracts, 1500–2500 words in length (9000–15000 bytes or 3–5 pages). Shorter abstracts will not give the program committee enough information to judge your work fairly and, in most cases, this means your paper will be rejected. Longer abstracts and full papers simply cannot be read by the committee in the time available. However, you may append a full paper to an extended abstract; this is sometimes useful during evaluation.

The extended abstract should represent your paper in "short form." The committee will want to see that you have a real project, that you are familiar with other work in your area (i.e., include references), and that you can clearly explain yourself. Please, this is not a mystery to be solved: you should have results and they should be summarized in your abstract.

A good submission will contain:
Abstract
• The abstract should be included verbatim in the final paper.
Introduction
• Introduce the problem: why is it important?
• Reference previous work.

How We Solved the Problem
• More details on the problem and its issues.
• Design decisions and tradeoffs, and why they were made.
• Implementation details.

Evaluation
• Data on performance and effort required.
• How well does it work?
• What would you do differently?
• If it failed, why?
• What did you learn from it?

Conclusion
• Summarize the paper, emphasizing why it is important and what was learned.

In addition to the extended abstract, every submission should include:
• A clearly designated contact author who will be your link to the program committee.
• A daytime phone number (essential!).
• A surface mail address (required).
• An email address, if available; email is by far our best path of communication.
• A home phone number (optional, although questions often arise on evenings and weekends).
• A FAX number (optional).
• Any special audio/visual equipment you may require to make your presentation as appealing as possible. A microphone, overhead projector, and 35mm projector are provided as standard equipment.

November/December 1991
Presentations are usually scheduled for 25 minutes.

Submissions should be sent to:
Rick Adams
UUNET Technologies, Inc.
3110 Fairview Park Drive, Suite 570
Falls Church, VA 22042 USA
Fax (703) 876–5059
Email: SAusenix@uunet.uu.net

Award for Best Papers
A cash prize for the best paper by a fulltime student as well as for best overall paper will be awarded by the conference program committee. With your submission, please indicate if you are a fulltime student.

TECHNICAL PROGRAM COMMITTEE
Chair: Rick Adams, UUNET Technologies, Inc.
Vadim Antonov, DEMOS
Keith Bostic, CSRG, University of California, Berkeley

Call for Invited Talks - Summer '92 Conference

As part of the technical sessions, a full series of invited talks will provide introductory and tutorial information on a variety of interesting topics, such as using standard UNIX tools, tackling system administration difficulties, or employing specialized applications. We welcome suggestions for new topics as well as submissions proposing a particular session. In your proposal, state the main focus, include a brief outline, and be sure to emphasize why your topic is of general interest to our community.

Bill Cheswick, AT&T Bell Laboratories
Judith E. Grass, AT&T Bell Laboratories
Carl S. Gutekunst, Pyramid Technology Corporation
Guy Harris, Auspex Systems, Inc.
Kenneth Ingham, Kenneth Ingham Consulting
Rob Kolstad, SunSoft, Inc.
Piers Lauder, University of Sydney
A. Elein Mustain, Ingres, An ASK Company
David Nichols, Xerox PARC
Jim Thompson, SunLabs, Inc.

RELEVANT DATES FOR SUBMISSIONS
Extended Abstracts Due: January 26, 1992
Notifications to Authors: February 25, 1992
Camera Ready Papers Due: April 15, 1992

Materials containing all details of the technical and tutorial program, conference registration, and hotel and airline reservation information will be mailed in March 1992. Contact the Conference Office.

Coordinators:
Tom Cargill & Andrew Hume
c/o Andrew Hume, AT&T Bell Labs
2C-515, Murray Hill, NJ 07974,
FAX (908) 582–5857
ITusenix@usenix.org or uunet!usenix!ITusenix

Work-in-Progress Reports
Coordinator: Lisa Bloch
Sun User Group, Tel: (617) 232–0514,
FAX (617) 232–1347, lab@usenix.org
Pre-Announcement and Call for Papers
USENIX C++ Technical Conference
Portland, Oregon, August 10 - 14, 1992

USENIX is pleased to host its fourth C++ conference in Portland, Oregon, August 10-14, 1992. Monday and Tuesday will offer tutorials; Wednesday and Thursday are technical sessions. This announcement provides early information about the schedule of events as well as persons to contact for further information.

Schedule of Events

Tutorials, August 10–11

Introductory and intermediate tutorials will be provided on the C++ language, libraries, and environments. Please contact the program chair if you wish to propose to give a tutorial or to suggest a topic you would like to see covered in a tutorial.

Technical Sessions, August 12–14

Topics for the technical sessions will cover the spectrum of recent research, development, and experience developing C++ software. Papers are solicited on all aspects of C++, including:

Compilation/Interpretation
Class Libraries and Frameworks
Databases and persistence
Distributed programming
Programming environments (including design and analysis)
Standardization and internationalization
Experience (including maintenance and reuse)

Submissions

Extended abstracts of at most 2500 words (10 pages double-spaced) should be submitted electronically (PostScript, troff, or TeX) or eight (8) copies on paper to the program chairman by March 20, 1992.

Authors will be notified of acceptance by May 15, 1992 and final camera-ready papers are due June 19, 1992.

Relevant Dates

Abstracts Due: March 20, 1992
Notification of Acceptance: May 15, 1992
Final Papers Due: June 19, 1992

Queries about the technical program and all submissions should be directed to the program chairman:

Jonathan E. Shopiro
UNIX System Laboratories, Inc.
184 Liberty Corner Road, Room 4N-C05
Warren, NJ 07059–0908 USA
Phone: (908) 580–4229
Fax: (908) 580–5631
Internet: shopiro@usl.com

Technical Program Committee

Jonathan E. Shopiro, UNIX System Laboratories (Chair)
Dag M. Bruck, Lund Institute of Technology, Sweden
Theodore C. Goldstein, Sun Microsystems Laboratories
Keith Gorlen, National Institutes of Health
Brian M. Kennedy, Texas Instruments
Dmitry Lenkov, Hewlett-Packard
Mark Linton, Silicon Graphics
Scott Meyers, Brown University
Barbara E. Moo, AT&T Bell Laboratories
Martin O’Riordan, Microsoft
Jim Waldo, Hewlett-Packard
Preliminary Announcement and Call for Papers
The Third USENIX UNIX Security Symposium
Baltimore, MD
September, 1992

In cooperation with
The Computer Emergency Response Team (CERT)

The goal of this symposium is to bring together security practitioners, system administrators and system programmers, and anyone with an interest in computer security as it relates to networks and the UNIX operating system. The symposium will consist of tutorials, invited speakers, technical presentations, and panel sessions.

This will be a three-day, single-track symposium. The first day will be devoted to tutorial presentations. The following two days will include technical presentations and panel sessions. There will also be two evenings available for birds-of-a-feather sessions and work-in-progress sessions. The dates and location of this symposium have not yet been determined.

Papers are being solicited in areas including but not limited to:

- User/system authentication
- File system security
- Network security
- Security and system management
- Security-enhanced versions of the UNIX operating system
- Security tools
- Network intrusions (including case studies and intrusion detection efforts)

Important Dates

- Extended abstracts due: May 15, 1992
- Notification to authors: June 15, 1992
- Camera-ready papers due: July 31, 1992

Send seven copies of each submission to the program chair:
Edward DeHart
Computer Emergency Response Team
Software Engineering Institute
Carnegie Mellon University
Pittsburgh, PA 15213-3890
(412) 268-6179
ecd@cert.sei.cmu.edu

Program Committee

Ed DeHart (Program Chair)
Computer Emergency Response Team
Matt Bishop
Dartmouth College
Bill Cheswick
Bell Laboratories
Ana Maria De Alvaré
Silicon Graphics, Inc.
Jim Ellis
Computer Emergency Response Team
Barbara Fraser
Computer Emergency Response Team
Ken van Wyk
Computer Emergency Response Team
Call for Papers and Participation:  
Micro-Kernels and Other Kernel Architectures  
Seattle, Washington, April 27 -28, 1992

The USENIX Association’s workshop on Micro-Kernels and other Kernel Architectures is aimed at comparing and contrasting existing micro-kernels and their macro-kernel counterparts. Industry pundits are claiming that microkernel technology is the next step in kernel design. This workshop intends to make a detailed technical investigation of the microkernel technology to discover whether the claims have merit or are just this year’s buzzword. The intent of the workshop is to identify micro-kernels’ strengths and weaknesses in comparison to each other and to the macro-kernels that they hope to replace. The comparisons will include functionality, modularity, ease of extension, maintainability, and performance.

The first day of the workshop will be devoted to talks of a tutorial nature on currently important micro-kernels and other kernels. Already committed are talks on Mach, Amoeba, Chorus, and Plan 9. Other talks will be added.

The second day will be devoted to papers on all aspects of micro-kernels or kernel architecture. Papers are being solicited in areas including but not limited to:

- Distribution
- Performance
- Fault tolerance
- Multiprocessing
- Scalability
- Real-Time on Micro-Kernels

If you are interested in submitting papers for either day, please send an extended abstract with an outline of your paper (email preferred) to the program chair (Lori Grob).

Program Committee:
Lori S. Grob, Program Chair  
Chorus systemes  
grob@chorus.fr  
grob@USENIX.org
Edward D. Lazowska  
University of Washington  
Robbert van Renesse  
Cornell University/Vrije Universiteit  
Avadis Tevanian, Jr.  
NeXT Computer, Inc.

Dates to Remember:
Abstracts Due: January 10, 1992  
Notification to Authors: February 14, 1992  
Papers Due: March 13, 1992

EurOpen Publications

The following publications are available from EurOpen. If enough USENIX members express an interest, we may make these publications available through our office. Send email to office@usenix.org if you would be interested in such an arrangement.

Proceedings:
Dublin Autumn '83 $ 3.28
Nijmegen Spring '84 8.20
Cambridge Autumn '84 8.20
Paris Spring '85 8.20

Copenhagen Autumn '85 16.40
Finland/Sweden Spring '87 2.80
Dublin Autumn '87 32.80
Munich Spring '90 32.80
Nice Autumn '90 41.00
Tromso Spring '90 41.00

EurOpen Email Directory, 2nd edition 32.80

(List prices are given in U.S. dollars, based on current exchange rates.)
Call For Papers
File Systems Workshop
Ann Arbor, Michigan, May 21–22, 1992

The USENIX Association and the University of Michigan’s Center for Information Technology Integration are sponsoring a workshop on file systems, to be held on May 21 and 22, 1992, on the campus of the University of Michigan.

The goals of the workshop are to bring together researchers and practitioners on all aspects of file systems, including:

- file system performance measurement and models;
- WORM and other optical systems;
- log-structured, RAID, and other high-performance systems;
- mass-storage and archival systems;
- support for replication, consistency, and mobility, in distributed systems;
- naming and location in very-large distributed file systems.

Workshop participants will be invited to present formal papers or informal "works-in-progress." There will be opportunities to identify and discuss trends, themes, and theoretical and practical aspects of file systems research and development.

Call For Papers

You are invited to submit original papers from any area related to file systems for presentation at the workshop and inclusion in the proceedings. Several categories of papers will be considered:

- original and unpublished research reports;
- reports of innovative applications of current technology to new problem domains;
- position papers on controversial points of practical or theoretical interest.

There will be opportunities for "less polished" papers to be presented in the workshop sessions.

Five copies of a full paper or extended abstract should be submitted to:

Workshop on File Systems
Center for Information Technology Integration
The University of Michigan
519 W. William Street
Ann Arbor, MI 48103-4943

Papers should include an attached separate front sheet describing:

- the title of the paper,
- the name(s) of the author(s), affiliation, mailing address, telephone, telefax and Electronic-mail numbers.

Papers will be selected by the Program Committee based on originality, relevance, and impact.

Important Dates
Manuscripts due: March 15, 1992
Program decision: April 1, 1992
Camera-ready copy due: April 15, 1992

Organization

Working sessions will consist of 15–20 submitted papers, presented in 20 and 30 minute time periods.

Program Committee:
Peter Honeyman (CITI, University of Michigan)
Michael L. Kazar (Transarc)
Larry McVoy (Sun Microsystems)
Mendel Rosenblum (Stanford University)
Liuba Shrira (MIT)

Local Arrangements:
Carol Kamm (CITI, University of Michigan)
Judy DesHarnais (USENIX Association)

Further Information
For further information, contact:
workshop@citi.umich.edu.
+1 313 763 4403 (Tel)
+1 313 763 4434 (FAX)
# Calendar of UNIX-Related Events†

<table>
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<th>Year</th>
<th>Month</th>
<th>Event</th>
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<td>1992</td>
<td>Jan</td>
<td>IEEE 1003</td>
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†Compiled with the assistance of Alain Williams of EurOpen and Susanne Wilhelm of Windsound Consulting.

*USENIX workshops, symposia, and mini-conferences
Call for Tutorial Proposals

In an effort to continue to provide the best possible tutorials to its membership, the Association would like to solicit proposals for future new tutorials. The proposals can cover any subject, ranging from introductory to advanced materials, although one should avoid overly introductory materials (i.e., a one day tutorial on “Introduction to C Programming” is not what we are usually looking for). Previous conferences have included tutorials on such diverse topics as UNIX Network Programming, X Toolkit Intrinsics, Topics in System Administration, Mach Virtual Memory Internals, System V, Berkeley, and OSF/1 Kernel Internals, and Software Contracts and Intellectual Property, among many others.

Tutorials usually run for a full day (6 hours of class time plus morning, lunch, and afternoon breaks), although we are currently experimenting with half day (3 hour) tutorials. A proposal should include a statement of what you want to teach, and a coherent outline to your tutorial (not simply a list of what you want to cover, but the order in which you want to cover it, with an estimate on the amount of time for each subject). Because a tutorial lasts on the order of 6 hours, we need to know that you can comfortably fill that time, but not overfill it (i.e., that you won’t suddenly discover at 4:30 that you have another 3 hours of slides left to present). If you have any supplementary materials to distribute (e.g., copies of papers, shell scripts, source code, illustrations, etc.), give an indication of the volume of supplementary material, and a rough count of the number of slides you will be presenting during class. (Historically, a typical tutorial has between 75–200 slides, along with up to 200 pages of supplementary material). If possible, include a couple of sample slides (one with text, one with a graphic) with your proposal. If you have a complete or draft course already done, a copy of the current materials would be most useful.

We also need to know if you will be presenting or distributing any source code. If so, is it copyrighted by someone other than you? If you do not hold the copyright, you must be able to demonstrate that you have permission to use this material (this may be dealt with by requiring course attendees to have a source license). Because the USENIX tutorials fall outside of the “fair use” clause of the U.S. copyright code, the same rules apply for supplementary papers or reports.

Finally, your proposal should also include a summary of your previous teaching or lecturing experience, as well as a couple of references (that is, one or two people who have seen you teach that we can contact). These may be your students, supervisors, or colleagues.

Remember, this is just a proposal, so nothing you submit will be cast in concrete. You may later decide to change some ordering of materials, or we may suggest some changes. You needn’t worry about getting it perfect the first time around. What we are trying to do is get a very solid feel for what you are offering. You must sweat out some of the details, but needn’t go too crazy over them.

The tutorial schedule is currently filled for the Winter 1992 conference in San Francisco, so all proposals will be for the Summer 1992 conference in San Antonio. The tutorial schedule for that conference needs to be decided upon by January 1992, so proposals for tutorials should arrive in December 1991. Please send your proposals to dvk@usenix.org, or by physical mail to:
Daniel Klein
USENIX Tutorial Coordinator
5606 Northumberland
Pittsburgh, PA 15217–1238

Be sure to include an electronic and physical address and a phone number. All proposals will be acknowledged upon receipt.
Book Reviews

A C++ Toolkit
by Jonathan S. Shopiro

C++ Primer, 2nd Edition
by Stanley Lippman

Reviewed by Russell Quong,
Purdue University

C++ is a strongly-typed, object-oriented programming language derived from C. Due to its widespread popularity, many books on C++ have recently appeared. Material in these books tends to fall into three rough categories: introductions to the language, advanced usage of the language, and reference manuals of either the language or a specific C++ library. The first book, A C++ Toolkit, is for those who already know C++ and falls into the second category. It consists of examples of “small, practical classes.” Although the author touches upon several worthwhile topics, the overall presentation is incomplete, and the writing style is too casual for repeated reading.

On the other hand, the primer is an excellent all-in-one C++ book, including a thorough explanation of the language and a reference quality description of the C++ I/O library. The second edition, reviewed here, describes Release 3.0 of C++ including the proposed template and error handling facilities.

A C++ Toolkit is not without merit. It considers useful topics such as reference counting, macros for generic classes, performance tuning, and memory management. The overall presentation is incomplete, and the writing style is too casual for repeated reading.

Unfortunately, the presentation in A C++ Toolkit is sketchy and inconsistent. At times, subtle issues are glossed over so that an expert knowledge of C++ is needed to fully understand the material. For example, in Chapter 7 on BitSets, the author suddenly mentions the virtual table pointer, a relatively advanced concept. At other times, simpler issues are discussed in detail, such as how to declare BitSets to be independent of the machine word size. In Chapters 7 and 8, the author complains about limitations of the current C++ compiler (Release 2.0) and gives specific coding details on how to cope with these limitations. But, in Chapter 9, the author emphasizes the opposing viewpoint, “Write your programs to the language, not to the implementation.” Finally, occasional fragments of code are either wrong or at least unfathomable to this reviewer.

In addition, A C++ Toolkit is too simple for an advanced book. Some of the C++ classes, such as BinaryTree and HashTable, are straightforward translations of C code. Two advanced C++ features, virtual functions and abstract base classes, are used sparingly. Some of the classes in A C++ Toolkit are described equally well if not better in other C++ books, including the C++ Primer.

In summary, the A C++ Toolkit assumes you already know C++, but the book is not likely to be of much use to an experienced C++ programmer. The material is somewhat simple and the presentation is poor to mediocre. Thus, A C++ Toolkit is only appropriate for programmers who know the C++ language quite well, but who have done little C++ programming, an unlikely combination.

In contrast, the C++ Primer is suitable for both beginning and experienced programmers. The book gradually introduces all language features with numerous examples of varying complexity. As such, the C++ Primer is an ideal book from which to teach C++.

The presentation in C++ Primer is thorough and readable. The coverage of complicated top-
ics, such as how C++ resolves an overloaded function call and how C++ deals with default parameters, is consistently clear. The new material on the template facility is authoritative and well integrated into the book. The detailed appendix on the C++ I/O library contains long overdue material. The overall coverage is precise enough to make C++ Primer a reference for experienced users.

The C++ Primer does have some weak spots. For example, the explanation of {t const} is lacking; several examples are given, but there is no explanation of why the type {t char * const} means a constant pointer. The section on static class members contains several examples, but this reviewer thought the overall explanation could be clearer. Finally, with a book of this size, finding specific information even with the index can require some hunting around. However, these complaints are relatively minor.

In summary, the C++ Primer is an excellent single volume introduction and reference to C++. The coverage is clear, complete, and authoritative. Strongly recommended.

Russell Quong is on the faculty in Electrical Engineering at Purdue University. His research interests include compiler optimizations, programming environments, and analysis of algorithms. He is currently teaching a C++ course.

LISA V Conference Trip Report

Barbara J. Dyker
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There were over 500 attendees to the LISA conference in San Diego. That’s twice as many as last year. There were 34 technical papers presented, compared to 19 last year. They also had a day of tutorials, informal concurrent technical sessions, and many BOFs.

The proceedings of the conference are available from the USENIX Association Office. This is a brief overview of the highlights of those sessions that I attended. The availability of any software described in the papers is noted in the paper. Most are freely available.

There was a good handful of papers that presented different ways to manage binary packages via nfs, links, distribution programs etc. Most of them presume the use of an automounter, typically amd (unless the presenter was on sun-only net). Aside from those presented, I heard folks talking about depot, coda, and fsinfo as great tools to check out.

“Managing Program Binaries in a Heterogeneous UNIX Network” described a file hierarchy concept and a program called 'lfu' to manage links and distributions. 'lfu' uses its own configuration language.

“If You’ve Seen One UNIX, You’ve Seen Them All” presented a program similar in function to Configure (distributed with PERL) that provides an assessment of the isms of a system in terms needed by admin sh and perl scripts rather than C system calls. For any system, it builds an sh script that sets environment variables of the answers it found to questions like “do we use the crontab command or a crontab file?”, “how do we echo without newlines?”, “what are the options to ps to get a full listing” (ax, or e), etc. That script can be sourced by any admin script and also be localized to enable more portable admin scripts.

“Software Maintenance in a Campus Environment: The Xhier Approach” presented another package for managing and distributing binary packages. It is more modular than 'lfu' and more easily managed from the client side.

An alternate session on printer management discussed alternatives to lpd(8). Most people seemed to be layering complexity on lpd to compensate for users’ inability to read a printcap file. It also seems that many folks still think the printcap file needs to be different on printer servers and clients, and are inventing complicated ways to
manage it. There are some folks using mdqs in place of lpd as a more generic solution to output devices.

There were two sessions on backups. One was dominated by four papers on Sun's new product, Backup Co-Pilot - which will only work with Suns, on Suns, and requires 4.1.1 and open windows. The other session included an excellent study on "Torture-testing Backup and Archive Programs: Things You Ought to Know But Probably Would Rather Not." Elizabeth Zwicky took about 10 backup/archive programs and tried to break them 18 different ways. They all broke and many times in very surprising ways. If you use tar, you should read this paper.

Rob Kolstad chaired a Panel: What is System Administration? The main idea expressed was that system admins typically provide the standardization at their sites between vendors' hardware and software platforms and site specific customization and support. Complexity of the sysadmin problem is directly related to heterogeneity. Rob also conducted a survey, the results of which will published on comp.org.usenix. The survey attempts to provide an idea of time performed on various tasks and staffing relative to site characteristics (size).

In the Tools session, "A Flexible File System Cleanup Utility" presented a tool which reads a config file to determine how to clean up things, such as .o files if the corresponding .c file exists, *.out, *~, #*#, etc. "Fdist: A Domain Based File Distribution System for a Heterogeneous Environment" presented a tool which works in conjunction with rdist(1) to provide a more useful interface, better feedback, and added functionality. "Link Globally, Act Locally: A Centrally Maintained Database of Symlinks" presented a program called 'symlink' which uses a config file to manage system links.

In the Dealing with Users session, "Modules: Providing a Flexible User Environment" presented a module approach to setting shell environment variables for applications. I thought this was the simplest, most useful tool at the conference. Unfortunately, it is not yet available. "Con-figurable User Documentation -or- How I Came to Write a Language with a Future Conditional" presented a tool called 'tpp' which is a preprocessor for dealing with the English language in writing conditional text documents. "We Have Met the Enemy, an Informal Survey of Policy Practices in the Internetworked Community" presented the results of a survey. The bottom line is that sysadmins have the responsibility for developing and enforcing policy with little or no assistance from non-sysadmin management in both education and commercial industry.

In the Keeping Track session, "hobgoblin: A File and Directory Auditor" presented a program which provides consistency checking and reporting. There is also a utility which will take a tar listing of a filesystem and automatically create the hobgoblin language necessary to check consistency. "Monitoring Activity on a Large UNIX Network with perl and Syslogd" presented a perl program called 'meter' which will report system configurable activity indicators via syslog: uptime, vmstat, whatever you like (any perl function). They also have tools which will graph the information. "SCRAPE (System Configuration, Resource and Process Exception) Monitor" presents a program which provides exception reporting of filesystem consistency.

In the Miscellaneous session, "Some Useful Changes for Boot RC Files", "Host Aliases and Symbolic Links -or- How to Hide the Server's Real Name," and "Redundant Printer Configuration" all provide quick and useful ideas on how minor changes can significantly reduce maintenance time.

There was a large alternate session on PERL: New Scripts For Old. Tom Christiansen collected somewhat embarrassing csh and sh hacks and presented how he would rewrite them in PERL. This was extremely useful in helping folks see the difference in the shell perspective vs. PERL perspective. The PERL results were typically 1/3 to 1/4 the length, much easier to read, and executed orders of magnitude faster. He also mentioned that he does not feel rc scripts should be in PERL.
An Update on UNIX-Related Standards Activities

Stephen R. Walli
Report Editor, USENIX Standards Watchdog Committee

P1202.1: Windowing Toolkit API

Luisa Johnson, Harris Space Systems, reports on the July 8–12, 1991 meeting in Santa Clara, CA:

The P1201.1 Working Group's attendance was significantly lower than that of previous P1201.1 quarterly working group sessions. Most participants expected much controversy due to the recent selection of the base and reference documents at the Boulder meeting in May. Fortunately, the participants that did show up for the week long meetings were more eager to start drafting the standards document than arguing over document selection. After all, these documents are only informational sources to be used in the drafting of the standard and the layered API standards document itself will most likely not resemble either of them.

The working group was fairly well represented by both layered API developers and current or future users. With the exception of the first morning session, no representatives from any major toolkit or hardware vendor actively participated in the P1201.1 sessions the rest of the week.

The working group spent the first morning discussing the usual administrative items and identifying a strategy to be used for the rest of the week in order to generate the first standard draft document. The strategy consisted of:

- reviewing the strawman document outline,
- identifying areas to be deferred or to be omitted from the standard,
- identifying and describing a basic list of objects including their attributes.

As a result of the document outline review process, a few minor modifications and additions were made to the General section, the Terminology and General Requirements section, and appendices were identified by the group. Topics covered by the group included:

- internationalization concerns,
- geometry management and anchoring,
- color,
- cursors.

Rationale will be added regarding the basic requirements list, language bindings, and the process that was used to select the base and reference documents.

The next area tackled by the group was that of identifying areas to defer for future meeting discussions or topics to omit from the standard. If the area had been or is currently being addressed by other working or standards groups, then it was considered out of our standard's scope. Areas such as drawing, resource formats, and resource languages were identified as possible areas to expand on once the initial first draft is completed.

WNDX Corporation made a presentation to the working group. Their product allows developers to specify a look and feel that may be different from the underlying GUI's "look-and-feel." It is implemented to the native library and emulates the style guide, so a developer could select the MacIntosh "look-and-feel" on a UNIX Windows environment. WNDX Corporation representatives informed the group of their desire to participate in this standards effort and the working group agreed that the standards effort could only benefit with the inclusion of new approaches and their lessons learned.

From the second day through the end of the week, P1201.1 worked diligently on the identification of objects and attributes. This became an iterative process by which the first pass was a simple candidate list of objects which became further defined each day. Attributes were assigned and refined throughout the week. No effort was devoted to the specific syntax and semantics to be utilized. Instead, for each object, pointers to both the Base and Reference documents were annotated for further details. By the end of the week, a robust set of objects and attributes had been identified and the working group members felt a sense of accomplishment which none had anticipated. Working group members felt that this had been one of the most fruitful meetings in their turbulent history. The next mailing will include the approved first draft.
With the lack of participation by any major GUI vendor, one can only wonder if the accomplishments achieved during this week could have been obtained had they not been so busy fighting the GUI PAR wars.

**POSIX.7: System Administration**

Martin Kirk <m.kirk@xopen.co.uk> reports on the July 8–12, 1991 meeting in Santa Clara, CA:

The July meeting of the POSIX.7 (System Administration) working group continued the new direction established over the previous two meetings.

Small groups continued work on Printer Management, Software Management, and further refinement of the “Big Sticky Issues,” i.e. the global context of these activities.

The most important results from the “Sticky Issues” small group were recommendations for the style and content of POSIX.7 standards. Their final recommendations will bring the group into full alignment with the rest of POSIX. The overall structure for each functional area standard will have sections for:

- **POSIX.1** style programmatic interfaces based on existing practice
- **POSIX.2** style command line interfaces based on existing practice
- Managed object definitions to provide a basis for the distributed system administration functionality [Ed. — It is appropriate to mention that these have no relationship to the communications object types to be managed with the object management API being defined by P1224 and POSIX.17.]

This approach represents a compromise between “traditional” systems administration and the object-oriented approach. Where there are existing interfaces available they will be used. They will be supplemented by managed object definitions needed to provide uniform interoperability between different implementations.

Adopting this approach, along with the earlier decision to build separate functional area standards instead of a monolithic tome, should enable the group to progress more swiftly.

The Print Management group has been pursuing an approach based on the MIT Palladium distributed printing system. They received a strong contribution from the UNIX System Lab (usl) championing the System V lp print system. This was a timely interjection, allowing us the opportunity to address the issues that would have undoubtedly arisen during the balloting process. By identifying both the common subset and the differences, it should be possible to provide the appropriate rationale for the contents of the eventual standard.

The Software Management group continued to make good progress. They are working with contributions from several sources, including AT&T, DEC, HP, Siemens-Nixdorf, and SCO. (My apologies to anyone I left out.) As one would expect, all these differing systems are remarkably similar in terms of the functionality they present to the user, and thus the group found it relatively painless to identify the large common subset between them.

The group’s other activity was to identify a third functional area in which to commence work. The chosen candidate was User Management as it was felt that many other system resources were managed in terms of their relationship to users.

By the time the next POSIX meeting takes place in October, the OSF Distributed Management Environment selection will have been announced. It will be very interesting to see what effect this has on the system administration standards process.
Trip Report: The Second SUUG Conference, Vladimir, USSR
Judith E. Grass, AT&T Bell Laboratories, Murray Hill, NJ grass@ulysses.att.com

Introduction

The second Soviet UNIX Users’ Group (SUUG) Conference was held from Sept. 23 to Sept. 27, 1991 in Vladimir, USSR. Vladimir is a small city (pop. about 300,000) about 300 kilometers northeast of Moscow. The conference was held in the Klyazma Hotel on the outskirts of Vladimir. This provided a comfortable, if somewhat isolated, site for the conference. The conference was attended by nearly 150 Soviet delegates and nine invited foreign guests.

What is the SUUG?

The Soviet UNIX Users’ Group was established in 1990 to bring together those who were interested in the UNIX system (UNIX is a registered trademark of the UNIX Systems Laboratories, Inc.) and other similar systems. The first SUUG conference, which I also attended, was held in Moscow at the end of October, 1990. The SUUG currently has about 35 institutional and 50 individual members. SUUG members include academics (professors and students), working programmers and other interested people from all over the Soviet Union.

This includes some individuals from the newly independent Baltic states (Lithuania, Latvia and Estonia), which could eventually form their own users’ groups. A large proportion of the SUUG board is made up of employees of DEMOS and RELCOM, or people with connections to that organization. DEMOS is a cooperative software venture that gave birth to RELCOM, a computer networking service cooperative. These organizations are especially influential in the SUUG’s management.

This conference was one of two major meetings planned by the SUUG this year. In November the SUUG will hold a workshop on “UNIX Applications Systems” in Moscow.

The Road to Vladimir

Registration for the conference opened in Vladimir on Monday, September 23. Although that may have been the official start of the conference, the conference really began that same day on the bus that brought most of the SUUG’s officers, the foreign guests and other assorted insiders from Moscow to Vladimir. The bus started from the Sputnik Hotel in Moscow, where a major part of the SUUG board embarked, rolled to the University of Moscow Department of Computer Science, where an overhead projector was obtained, picked up more delegates on Lenin Prospekt (yes, it is still Lenin Prospekt), proceeded to Georgiy Ostapenko’s apartment, where the proceedings were waiting, and finally filled the bus at Sheremetyevo airport, where the last of the foreign guests had just arrived. From Sheremetyevo to Vladimir was a three and a half hour drive. Conversation on the bus consisted of one part technical to one part political to one part catching up with old friends.

We arrived at the hotel late Monday evening, a day when the restaurant at the hotel is normally closed. No one had had supper, so we were hungry. The SUUG arranged for some sandwiches to be served in the second floor snack bar as a kind of opening night reception. The snack bar was small: three tables, twelve chairs, but soon we had about sixty people packed into it, munching sandwiches, toasting the success of the conference with vodka and getting acquainted and re-acquainted.

The Conference: Day One

The conference itself began on Tuesday with a keynote speech by Professor Ivannikov, editor of the prestigious journal “Programmirovaniye” and Member-Correspondent of the Academy of Sciences. In his speech Professor Ivannikov recalled the early days of Soviet computing on large mainframe machines like the BESM-6. In those days there was a spirit of cooperation and mutual assistance that he felt has been lost in recent times. He attributed the change to the explosion of new technology and a new interest in commercial gains, especially among the newest generation of programmers. Citing the Free Software Foundation, which in his opinion adheres to good Marxist principles, Professor Ivannikov called for the establishment of a similar effort in the Soviet Union and suggested several ways in which such
work could be funded. This could help establish a "world brotherhood of programmers" and place computing on a more solid moral footing. Although some people in the audience are actively involved in work related to the FSF (IPIAN, an institute associated with the Soviet Academy of Sciences, is cooperating with the Cygnus corporation, which supports FSF software, in a commercial venture), the keynote speech got a lukewarm reception.

The keynote speech was followed by a call by Sergei Kuznetsov, president of the SUUG, to establish a variety of working groups for computing in the USSR. This was inspired by the call for working groups at the EurOpen conference. Several possible examples were mentioned: networking, standards, and so on. These were also taken from EurOpen discussions. Working groups were promoted as an opportunity for SUUG members to work within an international context and to mix with the wider world.

All of the technical papers in Tuesday's schedule were presented by the foreign guests of the SUUG. The morning session was titled "UNIX — new approaches", while the afternoon was devoted to topics concerning object-oriented programming.

**Session 1: “UNIX — new approaches”**

The first speaker, Mike Karels of the University of California, Berkeley presented the same overview overview of the 4.4 BSD kernel architecture that he presented at the Budapest EurOpen Conference the week before. I had heard the presentation there, but two things were quite different in Vladimir. First, no speaker was limited in the amount of time allocated for a presentation. This meant that, with consecutive translation, the presentations often took 45 minutes or more. Second, the audience eagerly asked questions and the question and answer period after a talk frequently would take an additional half hour.

The 4.4 BSD effort is moving towards an implementation of the UNIX kernel that can be distributed free of UNIX System Laboratories license requirements (Formerly users would have required licenses from AT&T to run this code. This year USL was created and acquired ownership of the UNIX system, so USL now sells the required UNIX licenses. The distinction between USL and AT&T is not well understood in the Soviet Union, and I am not convinced that it is well understood elsewhere.) The audience asked many probing questions about licensing requirements for the 4.4 BSD kernel and other UNIX systems. This proved to be a hot topic throughout the conference. More questions were asked about the official export status of BSD networking technology. The United States government, through COCOM, is trying to restrict access to dynamic routing technology and other related technology. Naturally, this audience, which is the target of such restrictions, is very interested in these restrictions and eager to find ways around them.

Additional questions covered technical issues. These included questions about suitable hardware, memory management, conformance to standards and performance characteristics.

The second speaker of the morning was Peter Newland from the European office of USL. He spoke on USL's efforts to internationalize UNIX System V Release 4. The goal is to be able to provide localized versions of SVR4 for the European market. This work has to proceed on several levels, from choosing standard character set definitions to providing error messages and user interfaces in local languages and includes generating about 10,000 pages of documents for SVR4 in translation. Newland gave an effective overview of the nature of internationalization, and how it was being accomplished.

Some of this was not very satisfactory from a Soviet point of view. SVR4 internationalization is being done around ISO standard character sets, with ISO 8859 suggested for providing a Latin (ASCII style) character set wedded with an 8-bit Cyrillic representation. This raised several interesting questions. There is a similar character representation in use as a standard in the USSR: KOI-8. There are at least two other competing codes in the Soviet Union. It is unclear what relation KOI-8 has to ISO 8859, and no one offered to comment on what input the Russians have had to the ISO committee that defined a Cyrillic standard.

A Latvian delegate raised another interesting question: what good is a standard that allows him to write English text and Russian text, but does not provide a character set in which he can write Latvian text? For a worse case, consider an Ar
menian computer user who would routinely need to use two scripts (for the Russian and Armenian languages), both of which are significantly different from Latin characters. From this viewpoint, the ISO standards are clearly anglocentric. Unicode, an attempt to insert all possible characters into one universal character set, was only briefly mentioned.

Peter Newland brought up some of the rather sticky legal issues of exporting software to a country where there are no or few legal protections for intellectual property. Many Soviet UNIX system users have acquired their systems without benefit of licenses. This makes it difficult to develop and market applications either within the USSR or for sale to the West. It also makes it difficult for companies like USL to sell such applications within the Soviet Union. Given the legal situation and the scarcity of hard currency for software purchases, the Russian language market is not one that is being aggressively pursued.

The discussion following this talk was lively and touched on all of these topics. Peter Newland, as a representative of USL, had to deal with aggressive questioning about USL licensing and sales policies. These questions spilled over onto the two representatives of Bell Labs in attendance (Jaap Akkerhuis and myself). Neither of us were qualified to answer those kinds of questions. Since Peter Newland could answer such questions, I was relieved that I could refer them back to him.

Session 2: Object-Oriented Programming and UNIX

The afternoon session contained two papers on aspects of Object-Oriented Programming, which could be regarded a UNIX application. The first of these was my talk on Object-Oriented Redesign, that is the reengineering of older C programs in C++ to get the benefits of object technology. In general, this talk was well received, although I had to defend myself against the familiar complaint that object-oriented technology is nothing new and that the basic techniques have been known since Parnas. My defense was to point out that although the techniques have been known, little of the software being maintained today was written using those techniques and that relatively few programmers are using those techniques even today. The end effect is that there is a large body of code that needs renovation and few effective procedures offered for doing that work. My presentation was an attempt to explain a bridging technique for programmers that were not OOD insiders.

Other questions involved issues concerning building massive systems using OOD and some specific questions about C++. A significant portion of the audience was aware of C++ and object-oriented programming and very interested in practical, industrial experience with OOP. As indicated above, there were a fair number of sceptics as well. The discussions about OOD, OOP and related issues continued in the lobby well after the session ended.

Many in the audience remembered the presentation I gave in Moscow last year about the C++ Information Abstraction system (CIA++) and I answered several questions about the development of that system over the past year. CIA++ generates a database of information about structural aspects of a program. The database can then be used for program analysis. I discovered that similar program analysis tool projects are underway in the Soviet Union.

The second paper concerning object-oriented topics was presented by Gerhard Steinke of the University of Passau. Part of this talk reviewed the multilevel security model promulgated by the US Department of Defense (the so called “Orange Book”). The rest discussed the protection of information stored in objects organized into hierarchies by inheritance. Steinke showed how inheritance semantics and its implementation create problems for specifying and implementing secure, consistent access controls in object-oriented databases. I found this to be a very interesting talk, as did the Soviet audience.

These talks were followed by a poster session in the lobby. There were over a dozen short papers taped to the walls. The authors of these papers were prepared to discuss them with any interested parties. The poster papers included papers on UNIX based real-time control systems, document preparation, compilers and language processors, device drivers and several posters on networking and on various user interface designs. The poster presentations presented a broader cross section of computing in the Soviet Union than was generally apparent in the regular con
ference papers. Presenters came from Moscow, St. Petersburg (formerly Leningrad), Kiev, Kharkov, Novosibirsk and Protvino.

In general, the membership of the SUUG represented at this conference mostly came from the Russian Republic (primarily from Moscow, secondarily from St. Petersburg) with some attendees from Ukraine and the Baltic States. There was no one I could identify as coming from the Central Asian republics, but there also was no list of attendees provided to help confirm my impressions. The location of the conference may have skewed attendance this way. It may also be true that since the SUUG board is largely Moscovite, the center of gravity of the organization may be as well. The SUUG board is aware that their membership base is geographically skewed and they are interested in attracting more participation from other regions of the USSR.

**Evening Interlude: The UNIX system’s future in the USSR**

The evening of the first day was devoted to a general, open discussion of the future of the UNIX system in the Soviet Union. This started with some comments by Mike Karels about the further development of the BSD line of UNIX systems and more discussion of USL’s position on selling UNIX systems in the Soviet Union by Peter Newland. The open discussion was very frank and sometimes heated. Licensing, documentation, export controls and the cost of buying Western commercial software all were provocative issues.

The Soviets seem to be facing a choice of either trying to purchase UNIX or UNIX-like technology from the West, and so lagging behind the technology curve, or trying to develop indigenous systems. There are arguments for both positions. Commercially, applications built on international standards may be easier to exploit. With that comes the problem of choosing an appropriate standard, since even with POSIX, there still seem to be several. On the other hand, the Soviet computing environment is quite different than the typical Western UNIX environment, as it is largely built around personal computers rather than networks of workstations. Moreover, indigenous systems can be developed free of license fees that drain scarce hard currency.

The final question that dissolved the meeting into a free for all was: “Why do we need a UNIX system at all? Why not something else entirely?”. Shortly after this the moderator lost control of the meeting, which finally broke into discussion groups clumped in various corners of a rather small room. In general, these issues tend to be presented as mutually exclusive choices and compromises are not offered.

By late evening the meeting had spawned a number of parties in various rooms throughout the hotel. I found myself drinking vodka with the SUUG board and singing Russian folk songs with some of the Russian women present. The evening ended singing duets with one Russian fellow who had an amazing repertoire of American folk songs and blues. This was a happy ending to a full working day.

**Day Two: Vladimir and Email**

Wednesday, the second day of the conference, was not as heavily scheduled. The morning was devoted to a business meeting for the SUUG. The afternoon session offered a selection of papers on communications and electronic mail.

**A Tour of Vladimir**

As Western guests, we were not expected to be interested in the internal doings of the SUUG, so the conference organizers planned a tour of the city of Vladimir for us and other interested parties. Vladimir has a history that goes back nearly 900 years. Early in its history it was the capital for several of the most powerful of Russian princes. This legacy has left Vladimir and its immediate vicinity with a fair number of interesting churches and buildings from the 12–19th centuries. The largest of the cathedrals in Vladimir is a functioning Russian Orthodox church with an active congregation.

Vladimir is built on a prominent hill so that there are many places to get a good view of the surrounding countryside. One interesting view included a train heading north (away from Moscow) carrying about 30 armored military tanks on open flatbed cars. I pointed this out and was informed that this is routine. People in military uniform and military vehicles are much more common sights in the Soviet Union than is generally true in the United States or Western Europe.
The area surrounding Vladimir is primarily agricultural, and the potato harvest was underway during our visit. However, Vladimir is the administrative center of a province and an industrial center. The heavy industry and traffic in Vladimir proper generate a visible haze of smog. The air quality is not good. Some consumer goods seem easier to find in Vladimir than in Moscow. Our guide and our translator both spotted some good deals in shoes, a scarce commodity, and stopped the tour bus long enough to snatch them up. The foreign contingent hunted souvenirs with a lot more success than we had in Moscow the year before.

**Session 3: Communications and email**

The afternoon session of the conference contained two papers by SUUG members and one by an invited guest. All of these talks were related to networking of one kind or another. This is clearly a major interest of the SUUG membership. The talks by the Soviet speakers were given in Russian with translation either haphazardly provided or not provided for the non-Russian speaking guests. In general, no microphones were available either, so although I speak Russian, these particular talks were occasionally hard to follow.

The first of these was a short paper by V. Shaudkulis of INEUM (Moscow) that seemed closely related to the discussions of the previous evening. Like all of the talks given by the SUUG members, it was unaccompanied by any visual aids of any kind. Overhead transparencies and transparency pens are expensive and hard to get. The Soviet speakers presented their papers from memory without notes, something most of us would not want to attempt.

This speaker discussed some of the issues involved in building a native, license free, UNIX-like system from scratch in the Soviet Union. Part of the problem is simply the cost of mounting such an effort. Such efforts are underway in the USSR, and Soviet universities are involved. The goal of the speaker's work is to design an original UNIX-like system to run on multiprocessors using shared memory and synchronous communications. There are some initial results, but a lot of work remains to be done.

The second report of the day was presented by Micheal MacConmara of Dublin City University, Ireland. He gave a fascinating comparison of the kinds of telecommunications services available in the West and the lack of services provided in the USSR and an analysis of the systematic changes that would be required to bring Soviet telecommunications services up to Western standards. MacConmara is well qualified to discuss these issues: besides being the director of computer and communications services for Dublin City University, he is active in several advisory boards concerned with that topic, including the Information Center Mathematica (ICM) in Moscow. That is a Soviet Academy of Sciences project directed at improving the level of telecommunications and computer networking technology in the USSR.

Parts of this talk had deeply political overtones, as the issue of who in the Soviet Union is provided with what level of service is deeply intertwined with the political system and the idea of "distribution" (The word "distribution" has an entirely different meaning in Russian than in English. It refers to the way that people in privileged positions are given access to better goods and services through a highly elaborated system of special shops and institutions. The average Soviet citizen does not have access to the "distribution" system.) A second factor complicating the provision of phone services is the lack of metering on most Soviet phone lines. This part of the talk provoked a lot of highly animated discussion.

The second half of MacConmara's talk discussed computer systems and networking in the Soviet Union. For the most part, Soviet networking seems to refer to email-like connections between personal computers. There are several such networks in the Soviet Union. RELCOM operates the largest one. Others include VNIIPAS, SPRINT, Glasnet and Fidonet. The elaborate networks of large mainframes, workstations and assorted PCs connected by high-speed data lines are not familiar there. Nor are remote logins or database services generally available.

The last presentation of the session was by Valerii Bardin of RELCOM. This talk was an update of the growth of RELCOM since his presentation at the first SUUG Conference last November. Many more sites have been added to the
RELCOM network, and Bardin claims that RELCOM is now the largest computer network in Europe, if not in Asia as well. The role that RELCOM played in communicating to the world about the August attempted coup was also discussed. RELCOM became highly visible throughout the world because of that.

RELCOM is an independent enterprise that currently receives no assistance from the Soviet government. It provides communications services for anyone willing to pay their fees. This includes academic, commercial and governmental customers. The cost of providing electronic communications services is very high. Bardin attempted to explain their cost structure, as some of RELCOM's customers and potential customers feel that their fees are too high.

By Wednesday, Vadim Antonov of DEMOS (and RELCOM), had managed to find a phone line in the hotel that would allow him to dial into the Moscow RELCOM computers. Using a pair of notebook computers and a relatively slow modem, Vadim provided us with limited electronic mail facilities at the conference. Vadim would receive the message over the phone line, unplug from the line and carry the computer to the person it was intended for. The recipient could type a reply on the spot. Later in the day the laptop would get reconnected to the phone line, and the reply would go out. As awkward as this sounds, it worked better for me than the phones did. I never successfully managed to schedule and complete a phone call home. I did manage to send and receive several email messages. This was a vivid, real-life illustration of MacConmara's and Bardin's theses.

Day Three in Suzdal... Who's Minding the Store?

On Thursday a day-long tour of Suzdal was planned for all interested parties. Suzdal is a small town about 30 kilometers from Vladimir. In the 11th-13th centuries, Suzdal had major political significance. For centuries after this it remained an important religious center. Today it is a major tourist attraction due to its many cathedrals, churches and monasteries. Suzdal is indeed very picturesque. Our hosts did not want us to miss a very important and uniquely Russian treasure.

As a matter of fact, the entire SUUG board and many of the Soviet delegates took advantage of the opportunity as well. The bus to Suzdal was very much like a rolling conference center. The technical discussions continued as we took in the sights. Back at the Klyazma Hotel there were papers presented, but the audience for those papers had to have been greatly diminished. Thursday's agenda contained four papers, all related to UNIX toolkits and applications.

Day Four: Workstations and Miscellany

By Friday attendance at the conference had thinned out. The audience for the last two sessions was approximately half the size of that of the first day. It was unfortunate that two of the most interesting papers submitted by Soviet contributors were presented on Friday.

The first of these was a paper by A. Giglavyi and V. Leonas that presented a deep analysis and comparison of the development of workstations as opposed to personal computers. Very few aspects of the history, architecture or marketing of workstations were missed in Giglavyi's presentation. This included a discussion of the various flavors of UNIX systems for RISC architectures, peripherals, graphics and windowing systems, audio and multimedia applications. Giglavyi discussed a good deal of the politics of workstations that has led to such strange marriages as Apple and IBM's joint development venture. Sitting in the USSR, he has a unique perspective on these events. Unlike most of the papers presented at the conference, this one appeared in full in the conference proceedings. It would be worthwhile to translate this one into English and give it a wider audience.

Talks by Jaap Akkerhuis (AT&T, Bell labs) and by J. T. Pfenning (University of Bielefeld, Germany) addressed different aspects of managing large networks of heterogeneous workstations and PCs. Pfenning presented plans for a large network being installed at his University. This was a good illustration of what can be done using off-the-shelf technology. Akkerhuis's paper described work he did at the mt Xinu company on a product that would allow UNIX systems to be networked together with MacIntoshes. The goal was to create a system where either system had
equal access to the facilities present in the network.

V. Podsvirov presented the last paper of the conference. His thesis was that programming work inherently produces unhealthy mental states in its practitioners. These unhealthy mental states are conducive to poor physical health and bad moral health. Much of this results from the trance-like state induced by staring at a computer screen transfixed by deep abstract problem solving. Podsvirov suggested that it would be good mental hygiene for programmers to practice some form of mental exercise after a hard day's hacking to prevent permanent mental damage. This was a very entertaining talk and it was sometimes hard to gauge how serious the speaker's intent was. From subsequent conversations, I know he was quite serious. This is another paper that should be translated from the Russian and given a wider audience.

Conclusion

Although the conference officially ended with a closing dinner on Friday night, the real end was the long bus ride back to Moscow on Saturday. This was fairly quiet as most of us were exhausted.

I spent a fair amount of time discussing the translation of common English (and specifically American) programming jargon with the conference interpreter. Some terms, for example: "process threads", are truly difficult to render in Russian. Moreover, some writers use very colloquial language and jargon that is generally unknown to non-native English speakers. The translator had a plea for all English-language technical writers: "Please be kind, and don't forget there are unfortunate people like us who will have to understand and translate what you write"!

This conference was quite different from the first SUUG conference in Moscow. It was definitely on a smaller scale and a lot more loosely organized. As usual, the value of attending this conference was less in the content of the presentations than in the communication those papers provoked. I was very happy to have the opportunity to participate.
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brent@CSUFresno.edu or csufresnbrent
Commercial institutions or individuals:
Gordon Crumal (209) 251-2648
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CA – Irvine: the UNIX Users Association of Southern California meets the 2nd Monday of each month.
Rich Bergstedt (714) 582-0768
26755 Dulcinea
Mission Viejo, CA 92691
attmail.com/bergstedt

CO – Boulder: the Front Range UNIX Users Group meets monthly at different sites.
Steve Gaede gaede@sdal.com
Software Design &Analysis, Inc.
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FL – Coral Springs:
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FL – Fort Lauderdale/Miami: The South Florida UNIX Users Group meets the 2nd Tuesday of each month.
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FL – Western: The Florida West Coast UNIX Users Groups meeting the first Thursday of every month.
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Ed Gallizzi, Ph.D. (813) 864-8272
c.galizzi@compmail.com
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FL – Orlando: the Central Florida UNIX Users Group meets the 3rd Thursday of each month.
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Ben Goldfarb (407) 275-2790
goldfarb@hx9.ucf.edu
Mikel Manitius (407) 869-2462
codas,attmail@mikel

GA – Atlanta: meets on the 1st Monday of each month in White Hall, Emory University.
Atlanta UNIX Users Group
P.O. Box 12241
Atlanta, GA 30355-2241
Mark Landry (404) 365-8108

MI – Detroit/Ann Arbor: The SouthEastern Michigan Sun Local Users Group meets jointly with the Nameless UNIX Group on the 2nd Thursday of each month in Ann Arbor.
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rich@sendai.ann-arbor.mi.us web@applga.uucp

MN – Minneapolis/St. Paul: meets the 1st Wednesday of each month.
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NE – Omaha: meets monthly.
/usr/group/nebraska Phillip Allendorfer
P.O. Box 31012 Omaha, NE 68132 (402) 423-1400

New England – Northern: meets monthly at different sites.
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Peter.Schmitt@dartvax!dartmouth.edu
Kiewit Computation Center (603) 646-2085
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NJ – Princeton: the Princeton UNIX Users Group
meets monthly.
Peter J. Holsberg mcc!pjh
Mercer County (609) 586-4800
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Kevin Coyle (214) 991-5512
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TX – Houston: the Houston UNIX Users Group (Hounix) meets the 3rd Tuesday of each month.
Hounix answering machine (713) 684-6590
Bob Marcum, president (713) 721-8124
Chuck Bentley, vice-president (713) 789-8928
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WA – Seattle: meets monthly.
Bill Campbell (206) 947-5591
Seattle UNIX Group Membership Information
6641 East Mercer
Mercer Island, WA 98040-0820
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Washington, D.C.: meets the 1st Tuesday of each month.
Washington Area UNIX Users Group
9811 Mallard Drive
Laurel, MD 20708
Alan Fedder (301) 953-3626

CANADA – Toronto:
Evan Leibovitch (416) 452-0504
143 Baronwood Court evan@telly.on.ca
Brampton, Ont. Canada L6V 3H8
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