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AUUG General Information

Memberships and Subscriptions
Membership, Change of Address, and Subscription forms can be found at the end of this issue.

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AUSTRALIA

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Email: auug@munnari.oz.au

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Computer Science Department
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AUUG General Information

Next AUUG Meeting
The AUUG'94 Conference and Exhibition will be held from the 7th to 9th September, 1994, at the World Congress Centre, Melbourne.

Advertising
Advertisements to be included in AUUGN are welcome. They should conform to the standards of other contributions (see page 5). Advertising rates are $120 for a quarter page, $180 for half a page, $300 for the first A4 page, $250 for a second page, $500 for the inside cover and $750 for the back cover. There is a 20% discount for bulk ordering (ie, when you pay for three issues or more in advance). Contact the business manager for details.

Mailing Lists
For the purchase of the AUUGN mailing list, please contact the AUUG secretariat, phone (02) 361 5994, fax (02) 332 4066.

Back Issues
Various back issues of the AUUGN are available. For availability and prices please contact the AUUG secretariat or write to:

AUUG Inc.
Back Issues Department
PO Box 366
Kensington, NSW, 2033
AUSTRALIA

Conference Proceedings
A limited number of the Conference Proceedings for AUUG'92 and AUUG'93 are still available, at $50 for members and $60 for non-members. Contact the AUUG secretariat.

Acknowledgement
This newsletter was produced with the kind assistance of and on equipment provided by the Australian Nuclear Science and Technology Organisation. A copy of FrameMaker for use in the production of the newsletter has been provided by Platform Technologies.

Disclaimer
Opinions expressed by authors and reviewers are not necessarily those of AUUG Incorporated, its Newsletter or its editorial committee.
Editorial

Welcome to AUUGN Volume 14 Number 6, the last one for another year. I hope you all have a Good Christmas and a Happy New Year.

In this issue we have the final wrap-up of AUUG93, including the AGM and the details of where your money went. Unfortunately, AUUG these days has activities all the time, no sooner have we finished the winter conference, then we have the announcement of the summer conferences. This year, as an added attraction, we have obtained the services of Kirk McKusick to run tutorials in conjunction with many of these conferences. The Summer Conferences are a major activity for the technically minded members, so you should get behind it by submitting papers and other tutorial topics for presentation.

Also included in this issue are the usual topics, such as chapter activities, book reviews, and papers (from previous summer conferences). One item to note in particular, is the Uniforrn NZ conference, to which AUUG is trying organise a contingent.

Jagoda Crawford

AUUGN Correspondence

All correspondence regarding the AUUGN should be addressed to:-

AUUGN Editor,
P.O. Box 366,
Kensington, N.S.W. 2033.
AUSTRALIA

Phone: +61 2 717 3885
Fax: +61 2 717 9273
Email: auugn@munnari.oz.au

AUUGN Book Reviews

The AUUGN book review editor is Frank Crawford. Anyone interested in reviewing books or with book reviews to submit for publishing in AUUGN please contact Frank. His address can be found on page two of this issue. Remember, that any books you review, you keep.

Contributions

The Newsletter is published approximately every two months. The deadlines for contributions for the next issues of AUUGN are:

<table>
<thead>
<tr>
<th>Volume 15 No 1</th>
<th>Friday 28th January</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume 15 No 2</td>
<td>Friday 25th March</td>
</tr>
<tr>
<td>Volume 15 No 3</td>
<td>Friday 27th May</td>
</tr>
<tr>
<td>Volume 15 No 4</td>
<td>Friday 29th July</td>
</tr>
<tr>
<td>Volume 15 No 5</td>
<td>Friday 23rd September</td>
</tr>
<tr>
<td>Volume 15 No 6</td>
<td>Friday 25th November</td>
</tr>
</tbody>
</table>

Contributions should be sent to the Editor at the above address.

I prefer documents to be e-mailed to me, and formatted with troff. I can process mm, me, ms and even man macros, and have tbl, eqn, pic and grap preprocessors, but please note on your submission which macros and preprocessors you are using. If you can’t use troff, then just plain text or postscript please.

Hardcopy submissions should be on A4 with 30 mm margins, and 30 mm left at the bottom so that the AUUGN footers can be pasted on to the page. Small page numbers printed in the footer area would help.
Introducing the new I/O8+. A low cost intelligent I/O controller from Specialix, renowned for quality and performance in connectivity solutions. Ideal for small multi-user systems, the I/O8+ is more than just cost effective, it represents a major breakthrough in price/performance.

The secret lies in its high power RISC processor architecture, developed specifically for data communication applications. This enables the I/O8+ to deliver a sustained throughput of 19.2Kb/sec on all 8 ports simultaneously, with speeds of up to 38.4 Kb/sec supported. The I/O8+ offloads work from the main processor, ensuring that the overhead on the central system is kept to a minimum level. It also incorporates the latest surface-mount technology, providing even greater reliability.

For technical and pricing details on the I/O8+, please contact your local supplier...
AUUG Institutional Members as at 06/12/1993

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A.N.U.
AAIL
Aberfoyle Resource Limited
Actrol Parts
Adept Software
Advanced Software Engineering
Alcatel Australia
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Dept. of Planning & Development
Dept. of State Services
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DSTO, Lab 73
EASAMS (Australia) Limited
Electronic Financial Services Limited
Engineering Computer Services Pty. Ltd.
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Equity Systems Pty. Limited
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ESRI Australia Pty. Ltd.
FGH Decision Support Systems Pty. Ltd.
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Honeywell Ltd.
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I.B.A.
I.P.S Radio & Space Services
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Olivetti Australia Pty. Ltd.
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OPSM
OSIX Pty. Ltd.
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Pacific Semiconductor Pty. Ltd.
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Softway Pty. Ltd.
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St. Vincent's Private Hospital
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Sydney Ports Authority
System Builder Development Pty. Ltd.
Systems Development Telecom Australia
TAB of Queensland
TAFE NSW, Information Systems Division
Tandem Computers
Tauntersall Sweep Consultation
Technical Software Services
Telecom Australia
Telecom Australia Corporate Customer
Telecom Network Engineering Computer Support Services
Telecom Payphone Services
The Far North QLD Electricity Board
The Fulcrum Consulting Group
The Preston Group
The Roads & Traffic Authority
The Southport School
The University of Western Australia
Thomas Cook Ltd.
TNT Australia Information Technology
Toshiba International Corporation Pty. Ltd.
Tower Software Engineering Pty. Ltd.
Tower Technology Pty. Ltd.
Tradelink Plumbing Supplies Centres
Turbosoft Pty. Ltd.
TUSC Computer Systems
UCCQ
Unidata Australia
Uninet Consulting Pty. Ltd.
Unisys Australia Ltd.
UNIVEL
University of Adelaide
University of Melbourne
University of New England, Dept. of Maths, Stats & Computer Science
University of New South Wales
University of Queensland
University of South Australia
University of Sydney
University of Tasmania
University of Technology, Sydney
UNIX System Laboratories

Unixpac Pty. Ltd.
Vicomp
Victoria University of Technology
VME Systems Pty. Ltd.
Walter & Eliza Hall Institute
Wang Australia Pty. Ltd.
Water Board
Western Mining Corporation
Woodside Offshore Petroleum
Work Health Authority
Workstations Plus
XEDOC Software Development Pty. Ltd.
Zircon Systems Pty. Ltd.
Zurich Australian Insurance

UniForum NZ'94

The Open Advantage
11th Annual Conference
18-21 May 1994
Quality Hotel, Rotoma

Combine a little work with pleasure! Attend UniForum NZ'94 and see the sights of one of New Zealand's top tourist destinations at the same time.

The exchange rate works in your favour, and AUUG members may attend the conference at the NZ member rate.

Conference Registration
SNZ $395
SAU Approximate $325
before 20 April

SNZ $495
SAU Approximate $410
after 20 April

Hotel Accommodation $100 $85 per night

(includes attendance at all conference sessions 19-21 May, exhibition, and all meals except breakfast)

Tutorials (18 May) $150 $125 each

* Conversion to AU$ will depend on exchange rate fluctuations.

Registration forms will be available mid-March 1994. Contact Julie Jones, UniForum NZ, P.O. Box 27-149, Auckland, New Zealand, Ph 64-25-958-245 or fax 64-9-629-2015.
**AUUG President's Page**

Another year gone, and a new one has begun - the year of the Family to be exact! I'm sure the years are nowhere near as long now as they used to be!

**1993 in retrospect**

1993 was a good one for AUUG. The highlight was the formation of several State Chapters - only Tasmania is yet to officially form a Chapter, although there is an active UNIX group there as part of the ACS. During the coming year we will be fostering the growth of these chapters, and in so doing, encourage AUUG members to start to think in terms of their local State chapter first, rather than considering AUUG purely as a national association.

Another highlight was AUUG '93, our annual conference in September. Those of you who attended (and by far the majority of AUUG members did) would probably agree that it was the best yet. Certainly the press gave us a good rap, and because of the excellent exposure the annual AUUG conferences are becoming a major feature of the Australian IT industry. If you ignore the PC and MacIntosh events, the AUUG exhibition is the largest computer show of the year. This is of course due to the popularity of Open Systems, which is the flavour of the decade.

In this issue, Liz Fraumann reports on the financial side of the Conference, and I'm pleased to say that the entire event - ie Conference and Exhibition - was profitable. But only because of the contribution from the profits of the Exhibition. AUUG as an organization does not run the Exhibition - that is carried out by ACMS, who are professional Exhibition organizers. AUUG splits the Exhibition profits with ACMS. This is the only way we can keep the Conference costs as low as they are: next time you receive some junk mail in your In Tray for a two or three day Conference, take a note of the cost - it is generally in the vicinity of $250 - $300 per day.

**A Change in the Management Committee**

Chris Schoettle, who was elected to the Management Committee only in this past year, has relocated to the US to continue working with USL (whoops - Novell I mean) in New Jersey. We will miss Chris, and I would like to thank him for the contribution he made to AUUG in the short time he was on the Committee. However Chris will only be as far away as email, and we anticipate he will continue his involvement with us from afar.

To replace Chris, we have invited Rick Stevenson to join the Management Committee. Rick brings with him a wealth of UNIX experience. Until recently he worked for Pyramid on the Gold Coast on kernel development, but when that operation folded up, he joined Stallion as Marketing Manager. We welcome Rick to the Committee.

Phil McCrea
AUUG
Minutes of the 1993 Annual General Meeting
Auditorium, Sydney Convention and Exhibition Centre
Wednesday 29th September 1993

Officer Bearers Present: Phil McCrea (President), Glenn Huxtable (Vice-President), Peter Wishart (Secretary), Frank Crawford (Treasurer).

Apologies: Robert Elz

Seventy seven (77) AUUG members signed the AGM attendance record as being present at the meeting.

Meeting opened at 5:50 pm.

1. Minutes of Last Meeting
The President (Phil McCrea) advised that the minutes had been published in AUUGN Vol 13 No. 5 Oct 1992.

Motion: That the minutes of the 1992 AGM as published in AUUGN Vol 13 No. 5 (October 1992) be taken as read and accepted. Moved: Peter Chubb/Chris Keane CARRIED

2. Returning Officers Report
Michael Tuke, outgoing returning officer advised the meeting that a full report on the elections had been published in AUUGN Vol 14, no 4 (August 1993).

The results of the election were:
President: Phil McCrea
Vice-President: Glenn Huxtable
Secretary: Peter Wishart
Treasurer: Frank Crawford
Committee Members: Chris Malitby, Michael Paddon, Greg Birnie, and 2 positions vacant.
Returning Officer: vacant.
Assistant Returning Officer: vacant

Motion: That the returning officers report be accepted. Moved: Lawrie Brown/ Adrian Booth. CARRIED

The committee had co-opted members to fill the vacant positions. It was required by the constitution that the general meeting validate these appointments. The following motion was placed on in the published agenda.

"Motion: That this meeting approves of the appointments of Stephen Boucher and Chris Schoettle to the vacant general committee positions and Michael Tuke to the vacant Returning Officer position. Moved: P. Wishart/ F. Crawford"

Subsequent to the publication of the AGM agenda the last vacant position of Assistant Returning Officer had been filled by the committee. It was moved by Peter Wishart and seconded by Chris Malitby that the motion be amended by adding "and Gregory Bond to the vacant Assistant Returning Officer position.” The amendment was agreed to and the motion put.

Motion: That this meeting approves of the appointments of Stephen Boucher and Chris Schoettle to the vacant general committee positions and Michael Tuke to the vacant Returning Officer position and Gregory Bond to the vacant Assistant Returning Officer position. Moved: Peter Wishart/ Frank Crawford CARRIED
3. Presidents Report

The President, Phil McCrea, reported that there had been much activity with chapters over the past year. We now had chapters in each mainland state and territory and all were running a series of activities in their region.

There had been a change in the arrangements with ACMS for the conference that had resulted in more work for AUUG but a greater share of the profits. The treasurer would provide more details in his report.

Liz Fraumann, as Business Manager, had done an excellent job and had been invited to extend her contract for services to AUUG. ACMS had performed well in the role as the Secretariat and would continue in that role. Lachie Hill has been appointed as AUUG’s PR consultant.

The next major activity would be a membership drive.

Motion: That the President’s report be accepted. Moved: John Lions/ Greg Rose CARRIED.

4. Secretary’s Report

Peter Wishart, the Secretary, reported a 1992/93 Secretary’s report had been published in AUUGN Vol 14, No. 4 (August 1993). He summarised that report.

Motion: That the Secretary’s report be accepted. Moved: Janet Jackson/Ken McDonald CARRIED.

There was discussion about the location of the conference. It was suggested that Brisbane or Perth be considered as a future venue. It was noted during discussions on vendor reluctance at such locations, that the AUUG was a users group and should not be driven by the vendors. However it was also noted that international speakers may be jeopardised by lack of funds if the vendors were not involved. The conference for 1994 was already committed to Melbourne.

5. Treasurers Report

The Treasurer (Frank Crawford) reported that there was around a $34K loss for last year. This was due to the most part to the lack of a profit from AUUG92 in Melbourne. It had budgeted for a $65K profit and had actually run at a $25K loss.

The arrangements for the exhibition profit had been a 70/30 split favouring the exhibition organiser (ACMS). That had been changed this year to a 50/50 split. However AUUG must now also contribute to expenses for the exhibition.

It was estimated that the 1994 exhibition would contribute $100K to AUUG. The budget for the conference had expected $50K from the exhibition. So it appeared that we would make around $50 overall on the conference and exhibition.

The budget for this year had been based on around $20K from the conference so our position this year should be much better.

Full details of the finances would be published in AUUGN.

Motion: That the Treasurer’s report be accepted. Moved: Greg Rose/ Peter Grey. CARRIED.

6. Other Business

The committee reported that it had decided to provide extra support for one summer conference per year. This year that conference would be in Brisbane. Glenn Huxtable reported that an international speaker, Kirk McKusik, will be providing a tutorial and paper at the summer conferences. The logistics and schedule are still being sorted out.

The committee had appointed Adrian Booth as AUUG Historian to capture and document the history of AUUG. Anyone with historical information and items on AUUG is encouraged to contact Adrian.
Andrew McCrae suggested that the relationship AUUG had established with ACS (Aust. Computer Society) for the conference had not worked very well. We had offered discounts to ACS members for the conference, and advertised the conference jointly but had only got around 50 ACS members. Perhaps the ACS relationship would be better if done through the chapters.

Ken McDonald stated that CMGA (Computer Measurement Group of Australia?) were interested in a relationship with AUUG. They had been predominantly a mainframe based organisation but were moving to open systems. They had also approached SAGE-AU about a relationship. Ken stated that as he was their first contact he was happy to try to further the relationship.

Motion: that Ken McDonald be appointed point of contact with CMGA. Moved: Michael Paddoni/ Glenn Huxtable CARRIED.

Adrian Booth was coordinating a bulk 4.4BSD T-Shirt purchase on behalf of AUUG.

7. Next Meeting
The next meeting will be held in conjunction with AUUG94 at the World Congress Centre in Melbourne, September 1994. The exact date and time will be advised to members.

The meeting closed at 6:50 pm.

AUUG articles for the Australian

As you may be aware, AUUG submits an article to the Australian newspaper on a weekly basis. We’d like to encourage the involvement of our chapters and our members in this activity. The Australian is an important forum for making our views heard in the wider community.

Publishing an article in the Australian is of great value to our individual contributors as well since it is a respected and high-profile national newspaper. We can’t promise fame and fortune, but it is possible. :-) I am currently responsible for managing the submission of pieces to the newspaper and I’d like to put together a schedule so that I can guarantee a steady and trouble free flow of material.

This is, therefore, a call for people who are ready and willing to write an article in the next three or so months. Each article should be on a topic relevant to computing or open systems in general and should be 600-800 words in length. Articles should be submitted to me in some electronic form (email preferred).

If you are interested, please nominate a date from the list below that you are willing to commit to. If you can’t think of a topic, but are willing to write, nominate a date anyway and I’ll supply you with a list of ideas.

Available article dates (all Wednesdays):

6, 13, 20, 27 January
2, 9, 16, 23 February

Of course, if you have any questions, etc. please don’t hesitate to mail or telephone me.

Michael Paddoni
Iconix Pty Ltd. 851 Dandenong Road.
East Malvern, Victoria 3145, Australia.

Email: mwp@iconix.oz.au
Telephone: +61 3 571 4244
Facsimile: +61 3 571 5346
**A.U.U.G. INCORPORATED**

**PROFIT AND LOSS STATEMENT**

**FOR THE PERIOD ENDED 1ST JUNE 1992 TO 31ST MAY 1993.**

<table>
<thead>
<tr>
<th>Income</th>
<th>1993</th>
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<td>Other Income</td>
<td>424.00</td>
<td>589.00</td>
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<td>Auug 93</td>
<td>11,210.00</td>
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<td>Summer 92</td>
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<td>- Canberra</td>
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<td>- Melbourne</td>
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<td>- Adelaide</td>
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<td>- Perth</td>
<td>2,295.00</td>
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<tr>
<td>- Brisbane</td>
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<td>Security Video</td>
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<tr>
<td>Summer Conference 92</td>
<td>595.00</td>
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<tr>
<td>Uniforum Rebate</td>
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<td>2,665.98</td>
</tr>
<tr>
<td>Netcomm</td>
<td>2,930.74</td>
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</tr>
<tr>
<td>Summer Conference 93</td>
<td>11,386.50</td>
<td>-----</td>
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<tr>
<td>AARNET Subscriptions</td>
<td>33,400.00</td>
<td>12,745.00</td>
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<tr>
<td></td>
<td><strong>198,625.87</strong></td>
<td><strong>149,489.47</strong></td>
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# LESS EXPENSES

<table>
<thead>
<tr>
<th></th>
<th>1993</th>
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<tbody>
<tr>
<td><strong>Bank Charges</strong></td>
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<tr>
<td>- Credit Card</td>
<td>629.37</td>
<td>793.86</td>
</tr>
<tr>
<td>- Government</td>
<td>307.57</td>
<td>865.00</td>
</tr>
<tr>
<td>- General</td>
<td>-</td>
<td>661.15</td>
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<tr>
<td><strong>Total</strong></td>
<td>936.94</td>
<td>2,320.01</td>
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<tr>
<td><strong>Management Commitee/ Meeting Expenses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Air Fares</td>
<td>9,467.18</td>
<td>4,390.00</td>
</tr>
<tr>
<td>- Accommodation / Meals</td>
<td>385.40</td>
<td>487.55</td>
</tr>
<tr>
<td>- Parking</td>
<td>-</td>
<td>50.00</td>
</tr>
<tr>
<td>- Taxis</td>
<td>276.90</td>
<td>385.75</td>
</tr>
<tr>
<td>- Postage</td>
<td>-</td>
<td>17.90</td>
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<td>- Fuel</td>
<td>-</td>
<td>71.19</td>
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<td>- Refreshments</td>
<td>278.80</td>
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<td><strong>Total</strong></td>
<td>10,408.28</td>
<td>5,402.39</td>
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<td><strong>Membership</strong></td>
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<td></td>
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<tr>
<td>- Refunds</td>
<td>12.00</td>
<td>234.00</td>
</tr>
<tr>
<td>- Printing</td>
<td>10,831.20</td>
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<td><strong>Total</strong></td>
<td>10,843.20</td>
<td>234.00</td>
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<td><strong>Netcomm</strong></td>
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<tr>
<td><strong>AARNET Expenses</strong></td>
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<tr>
<td></td>
<td>1000.00</td>
<td>16000.00</td>
</tr>
<tr>
<td><strong>A.U.U.G. 90</strong></td>
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<td>708.00</td>
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<tr>
<td></td>
<td>3,803.00</td>
<td></td>
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<td><strong>A.U.U.G. 91</strong></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>476.00</td>
<td></td>
</tr>
<tr>
<td><strong>A.U.U.G. 92</strong></td>
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<td></td>
</tr>
<tr>
<td>- Airfare</td>
<td>-</td>
<td>2,983.60</td>
</tr>
<tr>
<td><strong>A.U.U.G.N.</strong></td>
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<td></td>
</tr>
<tr>
<td>- Postage/Freight</td>
<td>33,695.63</td>
<td>28,347.97</td>
</tr>
<tr>
<td>- Printing</td>
<td>33,695.63</td>
<td>31,331.57</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Summer 92

**Perth - Seminar Function Costs**
- Air fare: 1,596.00
- Advertising: 431.79
- Postage: 89.67
- Printing/Stationery: 57.67

**Sydney**
- Seminar Costs: 2,575.50
- Printing: 215.70
- Photocopying: 30.00

**Melbourne**
- Printing/Advertising: 1000.00

**Adelaide**
- Taxi: 54.20
- Air fare: 478.00
- Accommodation: 201.15
- Seminar Costs: 302.35
- Hire of Equipment: 200.00

### Summer 91

**Melbourne - Function**
- Video Costs: 2250.00
- 36.00

**Secretariat**
- Retainer: 2,400.00
- Other: 19,468.55

**Total**
- 21,868.55
- 15,162.55
## Chapters
- VIC 2,199.54
- ACT 5,777.01
- W.A. 663.00

## Mailing List
- Photocopying/Printing 8,639.55

## Symmetry
- Retainer 2,658.04

## Office
- L Fraumann 43,216.60
- Advertising 3,212.62
- Auditors Remuneration 1,888.75
- Freight/Postage 4,168.11
- Mailing 360.00
- Printing/Sationery 3,002.89
- Telephone 4,780.47
- Secretary Fees 6,084.59
- Wages 12,255.00
- Taxis 236.16
- General Expenses 2,993.00
- Travel Expenses 310.00
- Air fare 320.20

## TOTAL OPERATING COSTS
231,303.53

## General A/C Net Profit (Loss)
231,303.53

## A.U.U.G. 92 Net Profit (Loss)

## NET PROFIT

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Operating Costs</th>
<th>General A/C Net Profit (Loss)</th>
<th>A.U.U.G. 92 Net Profit (Loss)</th>
<th>NET PROFIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>151,091.87</td>
<td>(1,602.40)</td>
<td>13,826.64</td>
<td>$12,224.24</td>
</tr>
<tr>
<td>1993</td>
<td></td>
<td>(32,677.66)</td>
<td>(2,063.19)</td>
<td>($34,740.85)</td>
</tr>
</tbody>
</table>
# A.U.U.G. INCORPORATED

**PROFIT & LOSS**

**FOR THE PERIOD 1ST JUNE 1992 TO 31ST MAY 1993**

<table>
<thead>
<tr>
<th></th>
<th>1993</th>
<th>1992</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>10,875.17</td>
<td>22,901.64</td>
</tr>
<tr>
<td><strong>Less Expenses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advertising/ Promotion</td>
<td>6,670.84</td>
<td>9,075.00</td>
</tr>
<tr>
<td>Photocopying/ Printing</td>
<td>1,532.80</td>
<td>-----</td>
</tr>
<tr>
<td>Travel &amp; Accommodation</td>
<td>4,734.72</td>
<td>-----</td>
</tr>
<tr>
<td><strong>NET PROFIT (LOSS)</strong></td>
<td>12,938.36</td>
<td>9,075.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1993</th>
<th>1992</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>($2,063.19)</td>
<td>$13,826.64</td>
</tr>
</tbody>
</table>
### A.U.U.G. Incorporated

#### Balance Sheet

**As at 31st May 1993**

<table>
<thead>
<tr>
<th>Note</th>
<th>1993</th>
<th>1992</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Current Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>8,149.43</td>
<td>4,046.46</td>
</tr>
<tr>
<td>Receivables</td>
<td>5,553.62</td>
<td>10,581.32</td>
</tr>
<tr>
<td>Investments</td>
<td>121,222.24</td>
<td>155,038.36</td>
</tr>
<tr>
<td><strong>Total Current Assets</strong></td>
<td>134,925.29</td>
<td>169,666.14</td>
</tr>
<tr>
<td><strong>Non Current Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intangibles</td>
<td>988.10</td>
<td>988.10</td>
</tr>
<tr>
<td><strong>Total Assets</strong></td>
<td>$135,913.39</td>
<td>$170,654.24</td>
</tr>
</tbody>
</table>

| **Liabilities & Capital** |         |         |
| **Associated Funds** |         |         |
| Accumulated Profits | 135,913.39 | 170,654.24 |
| **Total Liabilities & Capital** | $135,913.39 | $170,654.24 |
A.U.U.G. INCORPORATED

NOTES TO AND FORMING PART OF THE ACCOUNTS

FOR THE YEAR ENDED 31ST MAY 1993

1. ACCOUNTING POLICIES
   The accounts are prepared in accordance with the historical cost convention. The Accounting policies adopted are consistent with those of the previous year.

2. INVESTMENTS
   Investments are shown at Market Value, Capital Gains tax is not taken into account in determining the investments unless a definite decision to sell has been taken and the related Capital Gains Tax can be reliably estimated.

   Dividends and other distributions from investments are taken to income on receivable basis.

3. CURRENT RECEIVABLES 1993 1992
   Withholding Tax 5,553.62 3,701.32
   Prepayment Membership 2,340.00
   Newsletter 4,540.00
   $10,581.32

4. CURRENT INVESTMENTS 1993 1992
   Quoted Investment
   C.B.A. - Term Deposit 34,596.00 32,673.87
   - Cash Management 86,626.24 122,364.49
   $121,222.24 $155,038.36

Vol 14 No 6 20 AUUGN
AUDITORS REPORT TO THE MEMBERS OF

AUSTRALIAN OPEN SYSTEMS USERS GROUP INC.

In our opinion -

1. The accounts which have been prepared under the historical cost convention are properly drawn up in accordance with provisions of the Companies (Victoria) Code, and so as to give a true and fair view of:
   
   (a) the state of the affairs of the organisation as at 31st March 1993 and of the results of the organisation for the year ended on that date, and
   
   (b) the other matters required by section 269 of that Code to be dealt with in the accounts.

2. The accounting records and other records and the registers required by that code to be kept by the organisation have been properly kept in accordance with the provisions of that code.

NICOL & NICOL
C.P.A.

STUART C NICOL
PARTNER

Dated at Melbourne this 30th day of September 1993.
Each year the AUUG Executive Committee, most recently under the leadership of Phil McCrea, does its best to ensure the annual conference and exhibition is both high quality and of general interest. It is always a challenge to plan an event a year in advance attempting to predict what will be of significance and valuable to a wide and varied audience, especially in an industry who's life can and does change dramatically in the twinkle of an eye. The Programme committee, lead by Piers Lauder, should be extremely proud. The statistics clearly reflect AUUG '93 gave the members what they wanted.

As the chart (below) indicates, 40% of the income for AUUG '93 was derived from Member Registration. This is a positive and significant contribution. The next largest income was from the tutorials, of which AUUG members accounted for slightly over one half.

The exhibition profits, which from time to time comes under close scrutiny by some members, also puts forth a significant contribution to the overall success of the event.

An area where AUUG leadership must make some difficult decisions is to what degree should the pursuit of non-members attending the event take place. It is noteworthy at this point to say the insertion of the membership application in the registration brochure secured over 100 new members.
As with all things in life, there is a "flip side." In the case of income, it is expenditure. Firstly, let me say, yes, the event was profitable. More important though, the Executive Committee felt it was appropriate to give the membership an indication of how the monies were spent.

This chart reflects only conference expenditures, as ACMS handles the exhibition. The largest expenditure is food and beverage. It should be noted this represents coffee/tea breaks, receptions, dinner, and all other consumables. It is, at times frustrating, to not be allowed to "bring in" food from other sources which may be less costly, but then there is the health factor which weighs heavily into any establishment providing food supplies. It was interesting many of the suggestions for improvements were to increase the choice and frequency of coffee/tea, juices, etc. for delegates. The '94 Programme committee, which is headed by Ian Hoyle of BHP, will undoubtedly take these and all other suggestions under advisement.

The next largest expense area is printing. In this category, the Conference Registration and Information Brochure and the Proceedings were the most costly. The '94 Programme committee will consider things like distribution of the proceedings on disk for future events. This may not only have a significant impact on production costs but it would be environmentally friendly.

A few people had indicated on the evaluation forms that we should spend less on international speakers. The majority of the speakers coming from overseas were sponsored by their organisations or by solicited sponsors. The percentage figure indicated here includes the package offered to all speakers. Anyone who has participated knows, it is not a commitment to be taken lightly and AUUG recognises the effort which is put forth and appropriately rewards it.
AUUG '94 has already commenced in planning. As indicated earlier, Ian Hoyle was selected to be the Chair for the event, and he in turn has selected his Conference Committee. As always we look forward to the participation from the membership at large and welcome suggestions which will continue to improve the overall success. If you would like to offer your ideas, please e-mail them to: auug94c@bhp.com.au If you do not have e-mail access, please post them to:

AUUG '94 Committee
P.O. Box 366
Kensington, NSW 2033

The Call for Papers will be issued and posted on aus.org.auug during the month of December. Watch closely so you too may seize the opportunity to share your latest developments or strategies with delegates at AUUG '94.

---

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- Client/Server architectures
- TCP/IP based networks
- Security auditing
- Network integration
- Benchmarking and performance tuning
- Software Quality Assurance
- UNIX Training
- Contract software development

For more information contact us by phone on (02) 698 2322,
by fax on (02) 699 9174, or by email on enquiries@sw.oz.au

79 Myrtle Street
Chippendale NSW 2008

PO Box 305
Strawberry Hills NSW 2012
Opportunity knocks softly sometimes...

If you missed AUUG '93 there is now a chance for you to at least purchase one of the few remaining copies of the proceedings; also one of the T-shirts!

The proceedings contain the full papers presented at AUUG '93, a volume of over 300 pages, complete with contact information for authors of the papers. These proceedings sell for $50.00(AUD) and include postage/handling fees. (Overseas orders will be charged postage.)

T-shirts, 100% cotton, Australian made, have the AUUG '93 conference logo screened in burgundy and black on the left chest. Tastefully done and classy enough to even wear to work or the Local Chapter meetings. T-shirts sell for $10.00 each, including postage & handling. Please specify L or XL size when ordering. Sizes are limited, first ordered, first served.

TO ORDER:
Send a fax with item, quantity, size if needed to: AUUG '93 Secretariat +61 2 332-4066. Credit cards will be accepted with proper authorisation and signature.
Announcement

For further information contact:
Organisers listed or,
Glenn Huxtable - VP - (09) 380-2878 tel
Liz Fraumann - Business Manager (02) 953-3542 tel/fax

WHAT: Berkeley 4.3 - 4.4BSD Workshops
WHEN: February - March 1994
WHERE: All states

The AUUG '94 Summer Conference Series promises to be very exciting for most participants. This year, the local chapters are providing a one to three day workshop by Dr. Marshall Kirk McKusick, in addition to the conference and workshops/tutorials.

Kirk's experience with the UNIX Operating System hails back to the early 1970's. He was instrumental in the development of Berkeley UNIX 4.3 and 4.4BSD. In fact, the was the principal developer of that operating system. He is often a guest speaker at the USENIX Conferences, and is a past president of that organisation. He received a Ph. D. in the area of programming languages from the University of California at Berkeley.

In the Berkeley tradition, Kirk is intelligent and witty. Cliff Stoll had his microwaved sneakers... Kirk has his pink flamingos. It is another great story and worth an extra coffee!

On a serious note, Kirk's workshops will be both informative and intense. Following is an overview and schedule for both the one and three day versions.

One Day Workshop:

An Introduction to UNIX Kernel Internals:
Data Structures and Algorithms

Who Should Take this Course

This course provides a broad overview of how the UNIX kernel provides its basic services. It will be most useful to those who need to learn how these services are provided. Individuals involved in technical and sales support can learn the capabilities and limitations of the system; applications developers can learn how to effectively and efficiently interface to the system; systems programmers without direct experience with the UNIX kernel can learn how to maintain, tune, and interface to such systems. This course is directed to users who have had at least a year of experience using the UNIX system and the C programming language. They should have an understanding of fundamental algorithms (searching, sorting, and hashing) and data structures (lists, queues, and arrays). Students will not need to prove relationship with a source license holder, as actual source code will not be presented.
Description

This course will provide a firm background in the UNIX kernel. The course includes coverage of most BSD-derived kernels including USL’s System V Release 4, Sun’s Solaris, and DEC’s Ultrix. The POSIX kernel interfaces will be used as examples where they are defined. Where they are not defined, the BSD interfaces will be described and then related to other vendors interfaces. The course will cover basic kernel services, process structure, virtual and physical memory management, scheduling, paging and swapping. The kernel I/O structure will be described showing how I/O is multiplexed, special devices are handled, character processing is done, and the buffer pool is managed. The implementation of the file system and its capabilities will be described. The file system interface will then be generalized to show how to support multiple file system types such as Sun Microsystem’s Network File System (NFS). The course will conclude with a brief introduction to the interprocess and networking capabilities of the system. It will provide an overview of networking terminology and an example use of the socket interface. The presentation will emphasize code organization, data structure navigation, and algorithms. It will not cover the machine specific parts of the system such as device drivers.

Session 1 - Kernel Overview
  Kernel terminology
  Basic kernel services
  Process structure

Session 2 - Kernel Resource Management
  Virtual memory management
  Scheduling
  Signals

Session 3 - Kernel I/O structure
  Special files
  Terminal handling
  File system implementation
  Network File System (NFS)

Session 4 - Networking and Interprocess Communication
  Concepts and terminology
  Basic IPC services

Course Text

Samuel J. Leffler, Marshall Kirk McKusick, Michael J Karels, and
Three Day Workshop (presented only in Melbourne):

UNIX Kernel Internals:
Data Structures, Algorithms, and Performance Tuning

Dr. Marshall Kirk McKusick
University of California at Berkeley

Who Should Take this Course

This course provides a broad overview of how the UNIX kernel provides its basic services. It will be most useful to those who need to learn how these services are provided. Individuals involved in technical and sales support can learn the capabilities and limitations of the system; applications developers can learn how to effectively and efficiently interface to the system; systems programmers without direct experience with the UNIX kernel can learn how to maintain, tune, and interface to such systems. This course is directed to users who have had at least a year of experience using the UNIX system and the C programming language. They should have an understanding of fundamental algorithms (searching, sorting, and hashing) and data structures (lists, queues, and arrays). Students will not need to prove relationship with a source license holder, as actual source code will not be presented.

Description

This course will provide a firm background in the UNIX kernel. The course includes coverage of most BSD-derived kernels including USL's System V Release 4, Sun's Solaris, and DEC's Ultrix. The POSIX kernel interfaces will be used as examples where they are defined. Where they are not defined, the BSD interfaces will be described and then related to other vendors interfaces. The course will cover basic kernel services, process structure, virtual and physical memory management, scheduling, paging and swapping. The kernel I/O structure will be described showing how I/O is multiplexed, special devices are handled, character processing is done, and the buffer pool is managed. The implementation of the file system and its capabilities will be described. The file system interface will then be generalized to show how to support multiple file system types such as Sun Microsystems's Network File System (NFS). Other related topics include performance measurement, system tuning, and security issues. The introduction to the interprocess and networking capabilities of the system will provide an overview of networking terminology and an example use of the socket interface. The presentations will emphasize code organization, data structure navigation, and algorithms. It will not cover the machine specific parts of the system such as device drivers.

Day 1 morning - Kernel Overview
  Kernel terminology
  Basic kernel services
  Process structure

Day 1 afternoon - Kernel Resource Management
  Virtual memory management
  Paging and swapping
  Scheduling
  Signals
Berkeley 4.3 & 4.4BSD Workshops

Day 2 morning - Kernel I/O structure
Special files
Terminal handling
Multiplexing I/O
Autoconfiguration strategy
Structure of a disk device driver

Day 2 afternoon - File System Overview
File system services
Block I/O system (buffer cache)
File system implementation
Support for multiple file systems
Network File System (NFS)

Day 3 morning - System Tuning
Performance measurement
System tuning
Crash dump analysis
Security issues

Day 3 afternoon - Interprocess Communication
Concepts and terminology
Basic IPC services
Example use of IPC and network facilities

Course Text

For dates, and venue of these workshops please consult the AUUG Inc. Summer Conference Series Announcement in this issue of AUUGN. For further details, contact your Local Chapter representative.
AUUG Inc. is pleased to announce its summer technical conference series for 1994. This year, in addition to the conference and workshops AUUG members are familiar with, the Local Chapters are offering a special tutorial by Dr. Kirk McKusick, principal developer of Berkeley UNIX® 4.3 and 4.4BSD on Berlekey UNIX.

Local organisers are hosting 1-3 day sessions in each state across Australia. Interested parties should contact the conference organiser listed below.

**Melbourne:**
Venue: Clunies Ross House
Feb. 3-5
Organiser: Stephen Prince
Chancery Lane Computer Services
Level 25
385 Bourke St.
Melbourne, 3000
(03) 608-0911 ph 608 0505 fax
email: sp@clcs.com.au

**Darwin:**
Feb. 9
McKusick Workshop
Feb. 10-11
Conference & Workshops
Organiser: Phil Marker
Dept of Computer Science
Northern Territory University
P.O. Box 40146
Casuaruna, NT 0811
(089) 466-382 tel (089) 270-612 fax
e-mail: pjm@pandanus.ntu.edu.au

**Hobart:**
Feb. 15
Conference
Organiser: Steven Bittinger
ITS
University of Tasmania
GPO Box 252C
Hobart, TAS 7001
(002) 207-406 tel (002) 207-488 fax
e-mail: Steven Bittinger@its.utas.edu.au

**Canberra:**
Venue - Workshops - Copland Bldg., ANU
Feb. 14
McKusick Workshop
Feb. 15-16 Workshops & Conference
Organiser: John Barlow
CISR, IBLOCK
ANU 0200 ACT
(06) 249-2930 tel (06) 249-0747 fax
e-mail: john.barlow@anu.edu.au

**Perth:**
Feb. 22
McKusick Workshop
Feb. 23 Conference
Organiser: Adrian Booth
Adrian Booth Computing Consultants
7 Glenrowan Place
Willerston, WA 6155
(09) 354-4936 tel (09) 354-4936 fax
e-mail: abcc@dialix.oz.au

UNIX is a registered trademark of X/Open in the U.S. and other countries.
AUUG Inc. SUMMER CONFERENCE SERIES ANNOUNCED

Adelaide: Venue - TBD
Feb. 28 McKusick Workshop
Mar. 1 Conference
Organiser: Michael Wagner
Systems Services Pty. Ltd.
32 Grenfell St.
Adelaide, SA 5000
(08) 212-2800 tel * (08) 231-0321 fax
e-mail: mhw@syserv.com.au

Sydney: Venue - TBD
Mar. 3 McKusick Workshop
Mar. 4 Conference
Organiser: Brenda Parsons
P.O. Box 43
Darlinghurst 2010
(02) 131-003 Ext. 2403 tel
(02) 808 2797 fax
e-mail: parson@coulomb.pcc.oz.au

Hobart: Venue - University of Tasmania Staff Club (Hobart)
Mar. 9-10 McKusick Workshop
Organiser: Steven Bittinger
ITS
University of Tasmania
GPO Box 252C
Hobart, TAS 7001
(002) 207-406 tel * (002) 207-488 fax
e-mail: Steven Bittinger@its.utas.edu.au

Melbourne: Venue - Clunies Ross House
Mar. 15-16 Tutorials & Conference
Organiser: Arnold Pear
Computer Science and Computer Engineering
La Trobe University
Bundoora, VIC 3083
(03) 479-1144 tel * (03) 470-4915 fax
e-mail: pears@latcs1.lat.oz.au

Tutorials: Robert Sturrock
e-mail: rms@deakin.edu.au

Brisbane: Venue - TBD
Mar. 24 McKusick Workshop
Mar. 25 Conference
Organiser: Michael Henning
CITR
University of Queensland 4072
(07) 365-4321 tel * (07) 365-4399 fax
e-mail: michi@citr.uq.oz.au

AUUG Inc. as a user group, exists to provide UNIX and open systems users with relevant and practical information, services, and education through cooperation among users.
Call for Papers

Fifth Annual Canberra Conference and Workshops

Canberra Chapter, AUUG Inc.
14/15/16th February 1994

A conference on UNIX and Open Systems.

The Canberra Chapter of AUUG Inc. is holding a summer conference on Wednesday February 16th 1994, in Canberra, ACT. This notice is a "call for papers" - we would like all people interested in giving a presentation to contact us and discuss the ideas you have. The conference talks should be about 20 minutes long (or possibly 50 minutes). The Program Chair for the 1994 Summer Conference is Jeremy Bishop. Please contact him on (06) 265 0431 (ph), (06) 265 0485 (fax) or jeremyb@helotrix.defcen.GOV.AU (e-mail) if you are interested in presenting a paper.

Workshops will be presented on Tuesday the 15th of February and should be 3 hours long (maybe 6 hours if required). If you are interested in presenting a workshop, please contact the workshop organiser David Baldwin on (06) 2495026 (ph), (06) 2493992 (fax), or David.Baldwin@anu.edu.au.

General Enquires:
John Barlow
Parallel Computing Research Facility, I-Block,
Australian National University
Canberra, 0200, Australia
(06) 249-2930 wk  •  (06) 282-1925 hm  •  (06) 249-0747 fax,
e-mail: John.Barlow@anu.edu.au
CALL FOR PAPERS
CALL FOR PARTICIPATION

Annual AUUG-NSW Summer Conference

3-4 March, 1994.

Each year AUUG hosts an annual summer conference in a number of regional centres around Australia. The next summer conference for NSW will be held on Friday, 4th March, 1994. In conjunction with the conference, a one day programme of workshops is also planned for Thursday, 3rd March, 1994. The aim of the event is to provide a local forum for the exchange and discussion of ideas and work in the Open Systems arena. It is a supplement to the AUUG National Winter Conference, but with particular emphasis on technical issues and content.

Participation in the conference is open to everyone, not just AUUG members. Presentations are invited from anyone involved in areas of UNIX or Open Systems activity, as well as people interested in giving a full or half day workshop.

SUBMISSION INFORMATION

Participants are invited to submit full papers or abstracts, preferably by email, to the program organizer, on or before Friday, 17th Dec, 1993. Email submissions should be in troff or postscript form. Postal submissions should consist of at least two A4 paper copies of the paper or abstract. Submissions should be written in English. Final papers should be no more than 12 pages in length and should be camera-ready.

Proposals for workshops topics should outline the format and content of the presentation, and clearly list the required presentation aids.

NOTIFICATION

Authors will be notified of acceptance by Monday, 17th January, 1994.
IMPORTANT DATES


PROGRAM CHAIR

Brenda Parsons
P.O. Box 43
Darlinghurst 2010

Email: parson@coulomb.pcc.oz.au

Phone: (02) 131-003 Ext. 2403 (bh)
       (02) 807 3862 (ah)

Fax: (02) 808 2797

ORGANIZING COMMITTEE

For more information about the conference, please contact any of the NSW Chapter Committee members. We can be reached by email at:

    nsw_auug@dwt.csiro.au

or individually as follows:

Brenda Parsons (Secretary/Treasurer)
Email: parson@coulomb.pcc.oz.au
Phone: (02) 807 3862 (ah)
Fax: (02) 808 2797

Julian Dryden (President)
Email: julian@dwt.csiro.au
Phone: (02) 809 9345 (bh)
Fax: (02) 809 9476

Farrell McKay
Email: Farrell.McKay@nms.otc.com.au
Phone: (02) 452 2486 (ah)
AUUG Inc. Northern Territory Chapter

Annual AUUGwet Conference and Workshops
9, 10, 11 February 1994

Call for papers.

The Northern Territory Chapter of AUUG Inc. is holding its "AUUGwet 94" summer conference in Darwin in February 1994.

Important Dates:

Wed 9th    Kirk McKusick Workshop 4.4Bsd
Thu 10th   Main Conference - presentation of papers (+ Conference dinner)
Fri 11th   Local Workshops

General Information:

An invitation is now extended for presentation of technical papers on day 2 of the conference. The standard conference talk will be about 20 minutes long, with 10 minutes question time following.

The third day of the conference on Friday 11th will be devoted to workshop topics. Anyone who might like to present a technical paper or run a workshop is invited to contact us to develop a presentation theme.

The theme of this year's conference will be "Open Systems in North Australia"; a wide topic designed to encourage a broad range of presentations.

The 1993 conference was attended by around 75 delegates mostly from the commercial, government and education sectors. Most had some active professional involvement in the movement towards open systems computing; with a strong leaning towards the UNIX environment. We had a broad mixture of technical and non-technical people.
Interstate or International speakers are most welcome. Assistance with tour itineraries taking in the sights of the magnificent Top End wet season will be given with pleasure.

Technical Papers

The 1993 presentation topics were:
Software Development Environments for Distributed Processing.
An Application Development in Stereo-Graphics.
System Building for a GIS Application.
Computing Applications in the Medical Research Environment.
Multimedia Developments for Open Environments. (Student prize winner)
Standards and Open Systems Technologies.
An Application Development with TITAN Text Retrieval Software.
GOSIP.
OSI Immigration at the Bureau of Meteorology.
Open Systems- The Maturing of the IT Industry.
Application of IT to DME Library System.
Relational Database and Distributed Processing.
An Application Development using MS Windows Environment.

Most 1993 presentations covered particular aspects of the named topics; presentations with similar themes would be quite welcome in 1994.

There will be a prize for the best program presented in the "Student" category.

Workshops

The length of these will be dependant on the topic, the presenters preferred approach, and the conference timetable. Workshops of 1 - 3 hours length are generally envisaged.

The topics last year were:
CSIRO Project LISA - Land Information System for South Australia.
Unix - an overview.
System Administration
Networks and Communications
Organisational Details

Programme Chair: Phil Maker
Phone: 089-466666
Fax: 089-270612
Email: pjm@it.ntu.edu.au
Post: NTU School of IT, PO Box 40146 Casuarina 0811

***NOTE** Dates have been changed since previous notices.

Bernie Dowd
Secretary
AUUGnt
24 November 1993
AUUG Queensland Chapter

1994 Summer Technical Conference

Preliminary Announcement and Call for Papers

The AUUG summer conference series provides a forum for discussion of technical issues and developments relating to UNIX and all aspects of open systems. The AUUG Queensland Summer Technical Conference will be a one day conference, to be held on Friday, 25th March 1994, in or near the Brisbane CBD (exact details to be announced).

The intended format is a number of presentations to an audience of people interested in the technical aspects of UNIX and UNIX applications. A number of invited interstate speakers will provide insight into topics of particular interest.

Call for Papers:

Authors are invited to submit papers presenting new or interesting results of current research, development, porting or implementation experience. This includes submissions on any other topic relating to technical issues of UNIX and open systems.

Speaker Incentives:

Presenters of papers are afforded free conference registration. Limited funding is available to interstate and remote Queensland speakers to assist with travel expenses.

Form of Submissions:

Please submit an abstract for your paper, together with an outline. The outline
should contain enough detail to allow the programme committee to make a reasoned decision about the final paper. Of course, a full paper is also perfectly acceptable. A submission should be from 2-5 pages and include:

1. Author names(s), postal addresses, telephone numbers, FAX and e-mail addresses.

2. A biographical sketch not to exceed 100 words.

3. Abstract: 100 words.

4. Outline: 1-4 pages giving some details of the approach used, algorithms implemented, sections of kernel hacked, or any other relevant information.

5. References to any relevant literature.

6. Audio-visual requirements: Please indicate your requirements for overhead projector, 35mm slide projector or video/television equipment.

Acceptance:

Authors whose submissions are accepted will receive instructions on the preparation of final papers for inclusion in the conference proceedings.

Organising Committee:

Sean Appleby - Sean Appleby Consulting
Greg Birnie - Leeds & Northrup Australia
Tim Butterfield - C&T Computing
John Havers - Stallion Technologies
Michael Henning - CiTR
David Hughes - Bond University
Stuart Remphrey - Wang
Rick Stevenson - Stallion Technologies
Ian Turner - IBIS Computer

Relevant Dates:

Abstract and outlines due: 28 January 1994
Notification to authors: 4 February 1994
Final papers due: 11 March 1994
Addresses:

Please submit hard copy or electronic copy of abstracts and outlines to:

QAUG Conference Committee
CiTR
Gehrmann Laboratories
Research Rd
University of Queensland 4072

e-mail: michi@ciir.uq.oz.au
Phone: (07) 3654321
FAX: (07) 3654399

For enquiries on conference registration, accommodation arrangements, promotion, venue and other matters not relating to the submission of papers, contact:

Tim Butterfield
C&T Computing
Unit 2, 240 Vulture St
South Brisbane 4101

Phone: (07) 8443263
FAX: (07) 8445592
CALL FOR PAPERS

AUUG SUMMER '94

1994 AUSTRALIAN UNIX AND OPEN SYSTEMS USERS GROUP
SOUTH AUSTRALIA SUMMER CONFERENCE

28 February - 1 March, 1994

Each year AUUG Local Chapters host annual summer conferences across Australia. The next summer conference for South Australia will be held on Tuesday, 1 March 1994. The day preceding the conference, 28 February 1994, this year is dedicated to a special tutorial on Berkeley UNIX 4.3 & 4.4BSD, presented by the principal designer, Dr. Marshall Kirk McKusick. In addition to Dr. McKusick's tutorial the group will offer a few additional tutorials. The aim of the two day event is to provide a local forum for the exchange and discussion of ideas and work in the open systems arena. This is a supplement to the AUUG National Winter Conference.

Participation in the conference is open to everyone, not just AUUG members. Presentations are invited from anyone involved in the areas of Open Systems or UNIX activity, as well as people interested in giving a full or half day tutorial.

SUBMISSION INFORMATION

You are invited to submit full papers or abstracts, preferably by e-mail to the programme organiser, on or before Friday, 7 January 1994. Submissions should be written in English. Final papers should be no more than 15 pages in length and should be camera-ready.

Proposals for tutorial topics should outline the format and content of the presentation and clearly list the required presentation aids.
NOTIFICATION

Authors will be notified of acceptance by Monday, 24 January 1994.

IMPORTANT DATES
Friday, 7 January 1994 - Deadline for submission of papers/tutorial topics
Monday, 24 January 1994 - Notification of acceptances
Monday, 14 February 1994 - Deadline for final papers and workshop papers

PROGRAMME CHAIR

Michael Wagner
Systems Services Pty. Ltd
Level 6, 32 Grenfell St.
Adelaide, SA 5000

(08) 212-2800 tel
(08) 231-0321 fax

e-mail: mhw@syserv.com.au

ORGANISING COMMITTEE

Alastair Dick
Telecom Australia
GPO Box 342
Adelaide, SA 5001

(08) 230 7062 tel
(08) 410 0023 fax

e-mail: adick@stnecss.telecom.com.au

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Amdel Ltd.
P.O. Box 338
Torrensville, SA 5031

(08) 416-5355 tel
(08) 234-5882 fax

Rodger S.B. Chan
The University of Adelaide
Adelaide, SA 5005

(08) 303-5873 tel
(08) 303-4361 fax

e-mail: catsmgr@aelmg.adelaide.edu.au
CALL FOR PAPERS

AUUG SUMMER '94

1994 AUSTRALIAN UNIX USERS GROUP
VICTORIAN SUMMER TECHNICAL CONFERENCE

March 15 - 16, 1994

Clunies Ross House

Parkville, Melbourne, Australia

Program Committee Chair: Arnold Pears, La Trobe University, Melbourne.

The purpose of the AUUG regional summer technical conference is to supplement the AUUG winter conferences by providing an informal, technical forum without vendor exhibitions for the presentation and exchange of current work in the area of UNIX. It is expected that the content of presentations at this conference will address technical issues which are relevant to programmers, system administrators and experienced users.

The Victorian chapter AUUG summer conference this year will follow a two day programme.

Day 1: Tutorials
Day 2: Conference
Proposals are invited for both tutorials and papers for the conference. Area of interest include, but are not limited to the following.

* Unix
* Open Systems
* Emerging and New Technologies
* Software Advances
* Networking

Authors are invited to submit three copies of a 500 word abstract to the Programme Committee Chair by the submission deadline. Final papers should be written in English, and should be at most 12 pages. Each paper should include a short abstract and a list of keywords indicating subject classification.

Tutorial proposals should be submitted to the Tutorial Co-ordinator. Tutorials are expected to run for approximately three hours, and the proposed format and required teaching aids should be clearly outlined in the proposal.

Email submission of abstracts, papers and tutorial proposals in postscript, or troff is encouraged.

Authors of accepted papers will be asked to prepare a final camera ready version of their paper for publication in the proceedings. Copies of the proceedings will be issued to delegates, and a limited number of additional copies will be available at the conference. Speakers accepted to make a presentation will receive complementary admission to the papers section of the conference.

Programme Chairs:
*************

Programme Committee:
=========
Arnold Pears
La Trobe University,
Bundoora, 3083.
Email: pears@latcs1.lat.oz.au
Ph: (03) 479-1144
Fax: (03) 470-4915

Tutorial Co-ordinator:
=========
Jon Eaves
TUSC Computer Systems,
666 Doncaster Road,
Doncaster 3108.
Email: jon@tusc.oz
Ph: (03) 840-2222
Fax: (03) 840-2277
Program Committee:
==================================
Chair: Arnold Pears, La Trobe University.
Tutorials: Jon Eaves, TUSC Computer Systems,
Steven Prince, Chancery Lane Computer Services.
Michael Paddon, Iconix.
John Carey, Labtam Australia.

IMPORTANT DATES
Dec. 6, 1993 (Mon) Abstract/Tutorial submission deadline
Dec. 20, 1993 (Tue) Notification of acceptance
Feb 21, 1994 (Mon) Final papers/tutorials due

For further information, please contact:
Arnold Pears
Organizing Committee Chairman
Computer Science and Computer Engineering
La Trobe University
Bundoora, Vic. 3083.
Phone: (03) 479-1144
Fax: (03) 470-4915
Email: pears@latcs1.lat.oz.au
Announcement and Call For Paper
for
Perth Summer Technical Conference

Wednesday, February 23, 1994

The Perth AUUG 1994 Summer Technical Conference will be held on February 23, 1994. Speakers are invited to speak on technical issues related to Unix and Unix-like systems, including but not limited to application development, system and network administration, and operating system research and implementation.

Prospective speakers are invited to submit abstracts to the Perth conference organiser, Adrian Booth, whose contact details appear below. Selected interstate speakers will have their travel and accommodation paid for by AUUG Inc. All speakers will receive complimentary conference registration.

Speakers at the Summer Conferences around Australia may be invited by AUUG Inc. to deliver their paper at the AUUG 1994 Winter Conference in Melbourne, with airfare, accommodation and registration paid by AUUG Inc.

A tutorial program will also be run in conjunction with the conference. A highlight will be a tutorial from Kirk McKusick (one of the principal architects of Berkeley Unix) on the internals of 4.4BSD. However, other tutorial presenters are also sought.

IMPORTANT DATES:

Closing date for abstracts: January 7, 1994.


PROGRAMME CHAIR

Adrian Booth
Adrian Booth Computing Consultants
7 Glenrowan Place, Willetton WA 6155

email: abc@dialix.oz.au
Ph: (09) 354 4936
Fax: (09) 354 4936
Tasmanian Summer Unix schedule

For details on paper submissions to the Annual Tasmanian Summer UNIX Conference please contact:

Annual Tasmanian Summer Unix Conference
15 February 1993
Venue: University of Tasmania, Hobart, Centenary Lecture Theatre
Time: 9am - 5pm, lunch included
Contact: Steven Bittinger, convenor
(002) 207406 fax (002) 207488
Steven.Bittinger@its.utas.edu.au

Tutorial: 9-10 March 1993
An Introduction to UNIX Kernel Internals:
Data Structures and Algorithms
Dr. Marshall Kirk McKusick
Venue: University of Tasmania Staff Club (Hobart)
Contact: Steven Bittinger, convenor
(002) 207406 fax (002) 207488
Steven.Bittinger@its.utas.edu.au
For further information contact:
Organisers listed or,
Liz Fraumann - Business Manager (02) 953-3542 tel/fax

WHAT: UPDATE - USENIX Conferences
WHEN: Jan 17 - 21 1994 and June 6 - 10, 1994
WHERE: U.S.A.

In the spirit of cooperation, AUUG Inc. is pleased to announce advanced registration for the USENIX Winter 1994 Conference. The event will be held Jan. 17 - 21, 1994 in San Francisco, CA, U.S.A. Technical sessions will run from Monday, 17 January through the 19th, followed by two days of tutorials, 20 January through Friday, 21 January 1994. Delegates can save $100.00(US) by registering BEFORE 27 December 1993.

Conference Sessions headings are as follows:

17 Jan '94
Simple Database Tools
UNIX on Wall Street
Wide-Area Information Access
Microkernels & Other Kernel Architectures & Experiences with Distributed Multiprocessor Systems (SEDM IV)
Interprocess Communication
Commercializing Garbage Collection

18 Jan '94
Efficient Scheduling & Networking
Beyond LEX & YACC: How to Generate the Whole Compiler
Kernel Performance
The Facts About Fax
System Development Tools
USENIX Symposium on Mobile and Location-Independent Computing
7th USENIX System Administration Conference (LISA VII)

19 Jan '94
NFS
Video Compression - What Do You Do When Everything is Changing?
Disks and File Systems
Objecting to Objects
Dealing With the PC World
TCL/TK Workshop

Tutorials:
20 Jan '94
Essential UNIX Programming
Window NT - An Architectural Overview
Topics in System Administration
Achieving Security in an Internet Environment
USENIX Update

20 Jan '94
OSF's Distributed Computing Environment (DCE)
How Networks Work
Client-Server Development with DCE/RPC
Porting to Solaris 2.X
TCL and TK: A New Approach To X11 And GUI Programming

21 Jan '94
UNIX Network Programming
Windows NT - Developing Client-Server Applications
Topics in System Administration
UNIX Power Tools - Getting The Most Out of UNIX
Distributed Object Computing With COBRA
The Law and the Internet
The Kerberos Approach to Network Security
Chorus and SVR4 UNIX
Introduction to Threads, POSIX PTHREADS, and OSF/DCE Threads
Sendmail inside and Out

Fees for Technical sessions, 17 - 19 Jan are $295 for USENIX and AUUG members BEFORE 27 December 1993. After this date add $50.00 (all fees are listed in U.S. dollars).

Fees for Tutorials are: two full day tutorials, $495.00, One full-day, $275. Late fee applies if postmarked after 27 December ($50.00).

For additional Conference or Registration information contact:
USENIX Conference Office
22672 Lambert St., Suite 613
Lake Forest, CA, 92630 U.S.A.

Tel: +1 714 588-8649
Fax: +1 714 588-9706
e-mail: conference@usenix.org

CALL FOR PAPERS - USENIX SUMMER '94

A Call for Papers has been issued by USENIX for the Summer 1994 Technical Conference, 6 - 10 June 1994, Boston Massachusetts.

Dates of Submission:
Submissions Due: 28 January 1994
Authors Notified: 21 February 1994
Camera-ready papers due: 8 April 1994

AUUG INC. SECRETARIAT
PO BOX 366 KENSINGTON NSW 2033
70 GLENMORE ROAD
PADDINGTON NSW 2021 AUSTRALIA
INC. IN VICTORIA ACN A0016636N
PHONE: +61 2 361-5994
FAX: +61 2 332-4066

Vol 14 No 6 50

more-more-more
How To Submit:

It is important that you contact the USENIX association office to receive detailed guidelines for submitting a paper; e-mail to summer94authors@usenix.org. In addition, enquires about submissions to the USENIX Summer 1994 Conference may be made by e-mail to margo@usenix.org.

The schedule for reviewing submissions for the conference is very short, so preferred submission is an extended abstract (although we will accept full papers). The object of an extended abstract is to convince the reviewers that a good paper and 25 minute presentation will result. They need to know that authors:

- are attacking a significant problem
- are familiar with the current literature about the problem
- have devised an original or clever solution
- if appropriate, have implemented the solution and characterized its performance
- have drawn appropriate conclusions about what they have learned.

The extended abstract should be 5 manuscript pages (single-sided) or less in length. It should represent the paper in "short form." Include the abstract as it will appear in the final paper. Include references to establish that you are familiar with related work, and if appropriate, performance data to establish that you have a working implementation and measurement tools. If the full paper has been completed, it may be submitted instead of an extended abstract. Full papers should be limited to 12 single-spaced pages. Every submission should include one additional page containing:

- the name of one of the authors, who will act as the contact for the programme committee.
- contact's surface mail address, daytime and evening telephone numbers, e-mail address, and (if available) fax number
- an indication of which, if any, of the authors are full-time students

Authors of accepted submissions will be notified by 21 February 1994. They will promptly receive instructions for preparing camera-ready copy of an 8 - 12 page final paper, which must be received by 8 April 1994.

Where to Send Submissions:

Submit one copy of an extended abstract or full paper by 28 January 1994 via at least two of the following methods:

- e-mail to summer94papers@usenix.org
- FAX to +1 510 548-5738
- MAIL to: Summer 1994 USENIX
  USENIX Association
  2560 Ninth St., Suite 215
  Berkeley, CA 94710
  U.S.A.
UniForum NZ '94 - Conference Countdown

"It's a cool autumn evening, you're in the hotel bar quietly sipping a drink and catching up with friends and colleagues. Outside the mist wreaths the trees and there's a strange, almost sulphurous odour in the air. Suddenly the peace is shattered by the eerie call of a Maori Challenge..."

Don't panic, you haven't been transported into a Kiwi version of a fantasy adventure - it's just the start of UniForum New Zealand Incorporated's 1994 conference which runs from Wednesday 18 May to Saturday 21 May 1994. The conference is being held in Rotorua, a place renowned for its thermal activity and Maori culture.

The format of UniForum NZ conferences is very similar to AUUG conferences with only one major difference - the conferences are held in the minor centres around New Zealand rather than the main cities. This enables delegates to get right away from their normal day-to-day distractions and totally focus on the conference. Year after year our conference surveys show that this is one of the most popular aspects of our conferences. Another aspect that is always commented on is how friendly and relaxed the conferences are.

The conference commences on the Wednesday with a day of half and full day tutorials. These cover a wide range of topics from introductory style presentations, both management and technical, to in-depth technical sessions. The tutorials are optional extras and are not included in the main conference registration fee.

The conference programme also covers a wide range of technical and management papers, presented by top overseas and local speakers. There is usually vigorous debate from the floor during UniForum NZ conference sessions. These sessions are broken up into one hour keynote/plenary sessions, forty minute stream sessions and one and a half hour workshop sessions. Birds-of-a-feather sessions run during the latter part of the lunch break and immediately after the main programme finishes in the afternoon. The programme is interspersed with carefully planned social events designed to provide the ideal environment for networking. Details of the programme were not available at the time this article was written but all will be revealed in a subsequent article. A brief description of the conference format follows.

The programme commences on the Wednesday evening with the President's Cocktail Party. This is a casual event, ideal for catching up with old friends from previous conferences or breaking the ice and meeting new people. As many delegates travel to the conference venue during the Wednesday, it's a relaxing way to wind down from the trip with a drink and some substantial munchies.
Thursday usually opens with a keynote session prior to morning tea and then breaks to stream sessions before and after lunch. After afternoon tea we all combine again for a plenary session, followed by the UniForum NZ AGM. The dinner on Thursday is usually a theme buffet, with delegates encouraged to wear something appropriate. This can vary from just a hat (and normal casual clothes) through to a full theme costume, providing great introductory conversation topics.

Friday follows the same pattern as Thursday, but with two plenary sessions at the end of the day. The evening events start with a champagne cocktail hour followed by the formal conference dinner. There is usually some form of after-dinner entertainment, and plenty of time to network.

Saturday starts with stream sessions before morning tea followed by the final keynote session. The conference winds up with the closing lunch, leaving plenty of time for delegates to travel home in the afternoon, if they choose. With venues such as Rotorua many delegates stay over for a day or so to do some sightseeing.

The conference is extremely good value-for-money. The conference registration fee includes the cocktail party, morning and afternoon teas, lunches on all three days, and the two evening social events. The only thing it doesn't include is breakfast, and many delegates just wait for our scrumptious morning teas anyway. The dinners include a selection of top quality wines, often from some of New Zealand's boutique wineries and, therefore not commonly found in many wineshops.

AUUG members may register for the conference at UniForum NZ member rates, NZ$395 (AU$325 approximately, at current exchange rates) if received by 20 April, otherwise NZ$495 (AU$410 approx). The half day tutorial fee is NZ$150 (AU$125 approx) and the full day fee is NZ$250 (AU$205 approx).

We have negotiated a very good tariff for accommodation, $NZ100 per night (AU$85 approx), so the only unknown costs are your travel costs, sightseeing and any personal spending. Move over Club Med! Of course the Australia/New Zealand exchange rate makes the costs even cheaper when calculated in Australian dollars.

We would love to see you at UniForum NZ '94. The New Zealand contingent that attended AUUG '93 had a marvellous time, we'd like to return the hospitality. Registration brochures will be available mid-March. Contact Julie Jones, PO Box 27-149, Mt Roskill, Auckland, New Zealand, phone 64-25-858-245, fax 64-9-629-2015.
AUUG Inc. - Victorian Chapter
(formally SESSPOOLE)

AUUG-Vic is the official Victorian chapter of AUUG Inc. It was the first Chapter of the AUUG to be formed, then known as SESSPOOLE, and its members have been involved in the staging of the Victorian AUUG Summer technical meetings every year since 1990. AUUG-Vic currently meets approximately every six weeks to hold alternate social and technical meetings. It is open to all members of AUUG Inc., and visitors who are interested in promoting further knowledge and understanding of UNIX and Open Systems within Victoria.

The purpose of the social meetings is to discuss UNIX and open systems, drinking wines and ales (or fruit juices if alcohol is not their thing), and generally relaxing and socialising over dinner. Whilst the technical meetings provide one or two "stand-up" talks relating to technical or commercial issues, or works in progress of open systems.

The programme committee invites interested parties wishing to present their work, to submit informal proposals, ideas, or suggestions on any topics relating to Open Systems. We are interested in talks from both the commercial and research communities.

Social meetings are held in the Bistro of the Oakleigh Hotel, 1555 Dandenong Road, Oakleigh, starting at about 6:30pm. Venues for the technical meetings are varied and are announced prior to the event. The dates for the next few meetings are:

- Tue, 25 January '94 Social
- Wed, 2 March '94 Technical
- Thu, 14 April '94 Social
- Tue, 24 May '94 Technical
- Wed, 6 July '94 Social
- Thu, 18 August '94 Technical

Hope we'll see you there!

To find out more about AUUG-Vic and its activities, contact the committee or look for announcements in the newsgroup aus.auug, or on the mailing list sesspoole@clcs.com.au.

<table>
<thead>
<tr>
<th>AUUG-Vic Committee <a href="mailto:auugvic-exec@clcs.com.au">auugvic-exec@clcs.com.au</a></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>President:</strong> Stephen Prince</td>
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<tr>
<td>Phone: (03) 608 0911</td>
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<tr>
<td>Email: <a href="mailto:sp@clcs.com.au">sp@clcs.com.au</a></td>
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<td><strong>Secretary:</strong> Neil Murray</td>
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<tr>
<td>Webster Computer Corporation</td>
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<td>Phone: (03) 560 1100</td>
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<td>Email: <a href="mailto:neil@wcc.oz.au">neil@wcc.oz.au</a></td>
</tr>
<tr>
<td><strong>Treasurer:</strong> John Carey</td>
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<tr>
<td>Labtam Australia</td>
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<td>Phone: (03) 587 1444</td>
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<tr>
<td>Email: <a href="mailto:john@labtam.oz.au">john@labtam.oz.au</a></td>
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<tr>
<td><strong>Programme Chair:</strong> Michael Paddon</td>
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<tr>
<td>Iconix</td>
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<td>Phone: (03) 571 4244</td>
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<tr>
<td>Email: <a href="mailto:mwp@iconix.oz.au">mwp@iconix.oz.au</a></td>
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</tbody>
</table>
It's been a busy time for AUUG-Vic committee since my last column in v14n5. Three events seem to be dominating business, which I'll describe briefly.

Regular Meetings

The technical meetings continue to be a success. The third meeting for the year was held on 12th October at the MTIA. Thank you to Stephen Boucher for organising the venue. An attendance of about 25 people heard a very interesting talk from Enno Davids on the challenges in GPS based vehicle tracking systems. This presentation was longer than previous talks, due to large amount of ground covered. since Enno covered everything from the basic background, through to explaining how GPS works and then methods for improving the results from such systems. Michael Gigante then gave a short "work in progress" update (complete with video) of his virtual reality research efforts at the Advanced Computer Graphics Centre, CITRI.

As promised in previous columns, the fourth and final technical meeting for the year was held on 20th November at the Wool Exchange Hotel in Geelong, for the benefit of our country members. Many thanks to Michael Paddon and Craig Bishop for organising this one.

The afternoon started with a talk by Warren Stokes from the Geelong District Water Board, about his experiences with the Kalpana Etherswitch and how they used it to link together multiple servers and multiple workstations. Enno Davids then presented the second half of his GPS talk. The first half was presented at the third technical meeting. Enno concentrated on the challenge of vehicle tracking using GPS data. The day finished off with almost everyone adjourning to Cafe Dodo for dinner and a social chat. The general consensus, is that the away meeting has been well worth the effort. A great day was had by all.

The next meeting (on December 16) will be a social night, to enable members to have christmas drink with one another.

Kirk McKusick Workshop

In my last column, I mentioned we were planning a three day workshop on BSD UNIX™ internals. This has now been confirmed, with the course being structured as:

3+4 February 1994 Introduction
5 February 1994 Advanced Course

I hope to have a registration brochure for this event available shortly. If anyone would like a copy sent to them when it's ready, please let me know.

Summer94 (Vic) Conference

Things have certainly been busy in this area; we nearly didn't have an organiser at one point. Anyway, we now have the dates and venue confirmed, as well as a volunteer to organise a tutorial programme:

15 March 1994 Tutorials
16 March 1994 Summer Conference

The venue will once again be Clunies Ross House, the same place as last year. The respective contacts for the two events:

Tutorials: Robert Sturrock
rns@deakin.edu.au
+61-052-27-2108
Computing and Communications Services
Deakin University
Geelong VIC 3217

Conference: Arnold Pears
pears@latcs1.lat.oz.au
+61-3-479-1144
Computer Science Department
La Trobe University
Bundoora VIC 3083

So if you would like to run a tutorial or present a paper, please contact either of these two people directly.

Other News

Well, it's getting close to that time of year again when elections will be held. So now is the time to start thinking seriously about nominating for a position on the committee for next year. The elections will be held in conjunction with the summer conference. All of the current committee will not be renominating again. As all feel that over four years on the committee is enough, and since AUUG-Vic is up and running, most feel they need to move on.

If you have any thoughts, ideas, comments on any matters, please feel free to contact the committee, preferably via email: auugvic-exec@clcs.com.au.
From the Western Front

The other day I found out via the net that my favourite band's lyricist uses a Powerbook to write his lyrics. Sigh. :-)

But more seriously, these days I'm managing Macs as well as Unix systems. Navigating the Mac user interface reminds me what it is I like so much about the Unix computing environment — the philosophy of building functionality from small tools, and letting the computer do the hard work.

It strikes me that the "religious" arguments between Mac and Unix aficionados stem from a disagreement as to what constitutes hard work. The Mac-happy (and many GUI marketing people) think the hard work is in learning and remembering commands, so the GUI interface does that part for you. To the Unix lover, the hard work is in repetitive tasks, so the system, especially through the shell, provides powerful facilities for automating them. No prizes for guessing which activity I call hard work.

GUIs certainly have their uses. On my X screen right now, I have xclock, xcalendar, xpostit, xmh, and three shell windows. The calendar is an interesting example, because I use the graphical interface for day-to-day scheduling, but have a cron job that runs on the 25th of each month to update the calendar's ASCII data files for the next month with my regular appointments, like the WAUG meeting on the third Wednesday. I set up the cron job because the amount of automation I want is beyond the scope of the regular-appointment facilities of any calendar program I've seen, and because I can extend it or make it work with a different calendar program (or even simply email me details of appointments, if I should prefer it that way).

The problem I have with the Mac environment is that this kind of general-purpose automation is out of reach of the average user. One can't even do a simple loop, for example to append "Backup" to the name of each of ten files. I cringe internally when I see one of our researchers perform the same tedious action ten times.

I cringe even more when the person is using a Unix system, via a graphical file manager, when the labour-saving power of the shell is only a mouse movement away!

Well, that's my little rant out of the way; onto news of AUUG's Perth activities. We've had a good bunch of speakers lately, and attendances are on the increase. In this AUUGN we have a previously-lost review of the August meeting, a second review of the particularly excellent September meeting, and a review of the October meeting, which ended up being an informal, enthusiastic Q&A session on 386BSD. Julian Elischer, author of the 386BSD SCSI system, was our one-man panel.

Like October's, the November presentation included several demonstration systems. It's always fun to have something to look at and play with, although I think it sometimes makes for a superficial coverage of the topic.

November's meeting was held at IBM's Perth office. Our friendly local IBM Unix people, Indulis Bernstein and Cameron Ferstat, described the PowerPC architecture and exhibited demos of that, the MS-Windows emulator WABI, and a neat-looking Mac emulator. Such emulators will be useful for poor souls whose departmental newsletter editors insist on MS-Word input. :-(

IBM have abandoned their "dry office" policy and provided beer and wine, as well as an excellent spread of sandwiches, fruit and other nibbles.

The Summer Conference, which WAUG can at last be officially involved in, is looming up. Adrian Booth is organising it. What with Kirk McKusick and, hopefully, a good bunch of local speakers, it should be a worthwhile day away from the office.

Janet Jackson <jackson@cw.r.uwa.edu.au>

From WAUG, the WA Chapter of AUUG

FYI: WAUG's postal address is PO Box 877, WEST PERTH WA 6005.
Email addresses: waug@uniwa.uwa.edu.au, waug-meetings@uniwa.uwa.edu.au, waug-newsletter@uniwa.uwa.edu.au.
August

Unix in Real Time Systems
David Basell, Industrial Micro Products Pty Ltd

I must admit to some trepidation when David started his talk — I always get nervous when someone starts a talk with a description of their company, and then reassures the audience that despite the way it might come across, the talk isn’t supposed to sound like an advertisement.

In this case, the talk wasn’t advertising the PSOS real-time integrated kernel that Industrial Micro Products sell, and use to develop industrial engineering systems. PSOS was just being used as an example of a real-time system.

David mentioned that there is little consensus on exactly what constitutes a real-time system, but mentioned that the sequence and duration of external event are of prime importance in such a system. Features that must be provided by a real-time system are:

Determinism: the behaviour of the system must be entirely predictable;

Throughput: the code on each critical path must be optimal;

Intensive I/O: I/O is fundamental to real-time systems, and mustn’t be an incidental add-on;

Reliability.

Traditional ways of structuring real-time systems include one monolithic single-threaded application, foreground/background processes, and true multitasking. Multitasking has the advantages that it facilitates a cleaner design, makes maintenance easier, is deterministic and responsive, and suitable even for complex systems.

David showed an example of a multiprocessor system running the PSOS kernel on one processor, and UNIX on another. The UNIX is not real-time, but has interfaces to the real-time layer. This offers great programmer convenience — the non-real-time aspects of an application can be developed in a familiar UNIX environment that hasn’t been hacked to support real-time.

I enjoyed David’s talk for its technical content, although slightly more breadth about other real-time systems might have rounded it out better.

September

Getting Better Value out of UNIX I/O
Jim Longwood, Senior Systems Engineer, Fujitsu Australia

This was one of the better talks we have had recently, and one of the better attended also. Jim told us that his talk would concentrate on I/O issues as he claims that 70% of interactive response time is consumed by I/O (which means that adding CPU will often not significantly improve matters).

On average, the time it takes for random I/O to complete is 64% composed of access time (the time it takes to move the disk head(s) to the correct cylinder), 35% composed of latency (the time that elapses while the disk controller waits for the disk to rotate the desired block under the disk head), and around 1% transfer time from the disk.

Hence a simple (and low-cost) optimisation of random disk I/O is simply to place commonly accessed files in the middle of the disk, and to place less frequently accessed files at either extreme. The easiest way to achieve this is to split each disk into several partitions, placing the heavily accessed files into the central partition(s).

How can you determine how your disks are performing? The main tools in Berkeley-derived versions of UNIX are vmstat (for macro data) and iostat (for device data). Under System V systems, the tools are sar -u and sar -d, respectively. You can also use tools supplied with your RDBMS.
Jim suggested that a disk utilisation greater than 25% (as reported by `iostat -D`) is symptomatic of a performance problem. (I have seen claims that disk utilisations of up to a sustained 50% are reasonable, but this obviously depends upon how much money you are willing to spend on performance).

Other data that may point out a possible disk performance problem is the `msps` column in the output of `iostat tds`. This shows the average number of milliseconds that elapsed per disk I/O request — you can compare this figure to the average seek times quoted by your disk manufacturer to get a feel for how well your drives are performing.

If you feel you may have an I/O bottleneck, things to investigate are high paging rates and/or high CPU usage, I/O response times greater than those expected (see the previous point), I/O caching levels, device utilisation levels, and symptoms of disk fragmentation (such as erratic I/O response times).

If the whole disk is busy, and you can’t simply scatter files across it to localise I/O, you are faced with two problems — continual movement of the disk heads, and I/O request queueing at the controller. Solutions fall into two types — splitting the files across more than one disk, or striping the data across several disks.

You can achieve higher reliability and performance by both mirroring and striping your data — “Software RAID”.

Specific tips for tuning RDBMS I/O include tuning the application, tuning shared memory (by caching database and dictionary buffers and avoiding bottlenecks within the RDBMS), using UNIX raw devices for I/O, placing database tables on different disks and controllers to the indexes, and tuning log files (the size of redo logs and the segmentation of rollback files).

I thought Jim’s talk was excellent — technical enough to be satisfying, but well-rounded by its pragmatism. Why don’t you give a similar talk in the future?

Adrian Booth, Adrian Booth Computing Consultants <abcc@dialix.oz.au>, (09) 354 4936
From WAUG, the WA Chapter of AUUG

October

386BSD Operating System

Julian Elischer, member of the 386BSD development group

Be warned — do not take notes within sight of the Hon. Secretary of WAUG! You will end up later like me, desperately trying to remember why you agreed to write the review and just what all those crumpled chicken scratchings on your scribble pad really meant! However, despite my grumbling now it was well worth spending an hour listening to Julian Elischer last month. Julian’s interesting and easy-to-follow introduction to 386BSD (or FreeBSD) served to whet the appetite for installing it ourselves.

During the talk Glenn did his best to stimulate discussion (and interruptions for Julian) by offering freebies from the recent AUUG conference such as T-shirts and conference packs. I don’t know that the quality of the questions improved but it did prompt a few quiet people to speak up.

Apart from all the information circulated before the meeting regarding supported devices, Julian talked about support for video cards via the X11 server. X386V1.3 (available for about 3 months now) supports many cards already and X386V2.0 with support for more cards is coming out “real soon”.

For those of us with less cash, the good news was that our old 386SX with 4Mb can run FreeBSD — slowly, but it will run. It will even support those old 5Mb ST502 drives we have littering up the place at home. For SCSI devices, Julian’s generic SCSI device driver will support just about any kind of device available. I have it on good authority that said SCSI device driver is acknowledged by the Unix community to be a classic in design for ultimate portability as it separates those segments of code unique to the CPU from all device-specific code. Only minor changes are required to port this driver to a new processor (minor to folk who write device drivers anyway!).

Also available is a public domain utility, `booteasy`, which displays a boot menu to prompt you to boot from Windows or 386BSD. Of course this assumes you have first managed to configure your system so that DOS and 386BSD can live happily together. Julian spent part of his talk on tips to help with this aspect of the installation; swap space (generally double the real memory) and a reminder to try really hard to pare the kernel down to around 500k or risk some inconvenience, and loss of the first 640k of RAM, in loading a larger kernel.
The evening concluded with a demonstration installation for those interested and a reminder that copies of FreeBSD not requested before the talk will be a mite slow in arriving since Julian has been unexpectedly dragged back to the US for 3 months. So if you did not ask for your copy before the talk then you will need to wait a while.

Maxine Croft <maxine@chi.uwa.edu.au>
From WAUG, the WA Chapter of AUUG

Open System Publications

As a service to members, AUUG will source Open System Publications from around the world. This includes various proceeding and other publications from such organisations as AUUG, UniForum, USENIX, EurOpen, Sinix, etc.

For example:

<table>
<thead>
<tr>
<th>EurOpen Proceedings</th>
<th>USENIX Proceedings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dublin Autumn’83</td>
<td>C++ Conference Apr’91</td>
</tr>
<tr>
<td>Munich Spring’90</td>
<td>UNIX and Supercomputers Workshop Sept’88</td>
</tr>
<tr>
<td>Trosmo Spring’90</td>
<td>Graphics Workshop IV Oct’87</td>
</tr>
</tbody>
</table>

AUUG will provide these publications at cost (including freight), but with no handling charge. Delivery times will depend on method of freight which is at the discretion of AUUG and will be based on both freight times and cost.

To take advantage of this offer send, in writing, to the AUUG Secretariat, a list of the publications, making sure that you specify the organisation, an indication of the priority and the delivery address as well as the billing address (if different).

AUUG Inc.
Open System Publication Order
PO Box 366
Kensington, NSW, 2033
AUSTRALIA
Fax: (02) 332 4066
ACSnet Survey

1.1 Introduction

ACSnet is a computer network linking many UNIX hosts in Australia. It provides connections over various media and is linked to AARNet, Internet, USENET, CSnet and many other overseas networks. Until the formation of AARNet it was the only such network available in Australia, and is still the only network of its type available to commercial sites within Australia. The software used for these connections is usually either SUN III or SUN IV (or MHSnet). For the purposes of this survey other software such as UUCP or SLIP is also relevant.

At the AUUG Annual General Meeting held in Melbourne on September 27th, 1990, the members requested that the AUUG Executive investigate ways of making connection to ACSnet easier, especially for sites currently without connections. This survey is aimed at clearly defining what is available and what is needed.

Replies are invited both from sites requiring connections and sites that are willing to accept connections from new sites. Any other site that has relevant information is also welcome to reply (e.g. a site looking at reducing its distance from the backbone).

Please send replies to:

Mail: Attn: Network Survey
AUUG Inc
P.O. Box 366
Kensington N.S.W. 2033

FAX: (02) 332 4066
E-Mail: auug@atom.lhrl.oz

Technical enquiries to:

Michael Paddon (mwp@iconix.oz.au) (03) 571 4244
or
Frank Crawford (frank@atom.lhrl.oz) (02) 717 9404

Thank you

1.2 Contact Details

Name: __________________________
Address: ________________________
______________________________
______________________________
Phone: _________________________
Fax: ___________________________
E-Mail: ________________________

1.3 Site Details

Host Name: ______________________
Hardware Type: __________________
Operating System Version: _______
Location: ________________________
New Connections

If you require a network connection please complete the following section.

Please circle your choice (circle more than one if appropriate).

A1. Do you currently have networking software? Yes  No

A2. If no, do you require assistance in selecting a package? Yes  No

A3. Are you willing to pay for networking software? If yes, approximately how much?

A4. Do you require assistance in setting up your network software? Yes  No

A5. Type of software:

- SUN III
- TCP/IP
- Other (Please specify):

A6. Type of connection:

- Direct
- Modem/Dialin
- X.25/Dialin
- Other (Please specify):

A7. If modem, connection type:

- V21 (300 baud)
- V22 (2400)
- Other (Please specify):

A8. Estimated traffic volume (in KB/day): (not counting netnews)

- < 1
- > 100: estimated volume:

A9. Do you require a news feed? Yes  No

A10. Any time restrictions on connection?

- Limited (Please specify):

A11. If the connection requires STD charges (or equivalent) is this acceptable? Yes  No

A12. Are you willing to pay for a connection (other than Telecom charges)? If yes, approximately how much (please also specify units, e.g. $X/MB or flat fee)? Yes  No

A13. Once connected, are you willing to provide additional connections? Yes  No

A14. Additional Comments:
ACSnet Survey

Existing Sites

If you are willing to accept a new network connection please complete the following section.

Please circle your choice (circle more than one if appropriate).

B1. Type of software: SUNIII MHSnet UUCP
    TCP/IP SLIP
Other (Please specify): ____________________________

B2. Type of connection: Direct Modem/Dialin Modem/Dialout
    X.25/Dialin X.25/Dialout
Other (Please specify): ____________________________

B3. If modem, connection type: V21 (300 baud) V23 (1200/75) V22 (1200)
    V22bis (2400) V32 (9600) Trailblazer
Other (Please specify): ____________________________

B4. Maximum traffic volume (in KB/day): (not counting netnews)
    < 1 1-10 10-100
    > 100: acceptable volume: ____________________________

B5. Will you supply a news feed?
    Yes No
Limited (Please specify): ____________________________

B6. Any time restrictions on connection?
    Please specify: ____________________________

B7. If the connection requires STD charges (or equivalent) is this acceptable?
    Yes No

B8. Do you charge for connection?
    If yes, approximately how much (please also specify units, e.g. $/MB or flat fee)?
    Yes No

B9. Any other restrictions (e.g. educational connections only)?

B10. Additional Comments:
Book Reviews

Here are this month’s collection of book reviews. Instead of the ones from our usual Publishers, we have a selection from X/Open. With all the recent changes to the ownership of Unix and the Unix trademark it is appropriate to see what sort of standards X/Open specify. All the X/Open standards are available from:

X/Open Publications
PO Box 475
Ringwood 3134

Phone: (03) 879 7412
Fax: (03) 879 7570

We also have a second review of Learning the Korn Shell, a Nutshell Handbook. Occasionally we receive two copies of books and this is such a case.

Finally, lately we have had lots of books to review. Keep an eye on the newsgroup aus.org.auug for details.

Frank Crawford

X/OPEN COMPANY LIMITED (January, 1992)
CAE Specification X/Open Transport Interface (XTI)
by X/Open Company Ltd,
200pp., (Soft Cover)
ISBN 1-872630-29-4

Reviewed by
Keith Lugsden
LORIL Pty Ltd
<keithl@research.otc.com.au>

X/Open is widely respected within the Unix open systems community for trying to bring some order to the implementation of open systems. It is producing a comprehensive environment based on present and developing standards, called the Common Applications Environment (CAE). With NCR proposing to assign its Unix copyrights to X/Open, the organisation and its standards are likely to achieve even more relevance to open systems implementors and users.

The X/Open Transport Interface (XTI) is concerned mainly with the ISO Transport Service Definition, but also includes the more familiar Transmission Control Protocol (TCP) and User Datagram Protocol (UDP). The XTI, as presented in the specification, is implemented as a set of C library functions and is designed to be Unix-variant independent.

The specification provides six chapters and eight appendices. The first five chapters provide a well-written background to the XTI and guidelines on how to use it. For those of us who like concise, unambiguous and informative specifications, Chapter 6 is excellent. It lists each of the C library functions with a synopsis, description, list of valid states, possible errors, return values and cross-references to related functions. There are in all 27 functions described. To remove some of the confusion often involved in such situations, Appendix F provides a full listing of xti.h, the include file required by user and kernel developers alike to access any of the C functions.

For those of us who are used to standard network functions such as accept(), bind(), connect(), listen(), etc, it is reassuring to see that the new equivalents all have a similar name, usually just with a _ prefix, as in _bind(). Their usage is also similar.

This specification will be an essential reference for anyone intending to implement or use the XTI, or who simply has an interest in such things. I will certainly be keeping a copy amongst my reference texts. It is not a general tutorial on the transport layer and should not be seen as such.
This is an extremely short "document". The document is a high level description of the Distributed Transactional Processing (DTP) model as defined within the X/Open Common Applications Environment (CAE). An application that is compliant with the X/Open CAE is assured "portability", "interchangeability" and "interoperability" with other X/Open applications. This is not "a reference for", but rather a "description of" the X/Open DTP model. It is aimed at application developers, system administrators, resource manager providers and transaction manager providers who need a working understanding of the X/Open DTP model. As such, this document is requisite reading for such people. The document is meant to be read in association with other relevant X/Open documents (itemised in the document).

Potential readers should have a working knowledge of transactional systems in order to understand these models. A suitable introductory book such as Gray and Reuter's Transaction Processing: Concepts and Techniques [1] is, in the reviewer's opinion, pre-requisite reading. The document achieves its limited purpose as an introduction to the maze of X/Open acronyms, and illustrates the structure that X/Open compliant applications should possess.

The document presents the functional, process and communications models of the X/Open DTP model. The functional model describes the inter-relationship of the functional components of the model. These are the application program (AP), the transaction manager (TM) and the resource managers (RMs). The process model discusses the acceptable, as well as un-acceptable ways that the AP, TM and RMs can inter-operate. Furthermore, groups of processes called domains are introduced. Such groupings are introduced to allow administrative control for DTP applications.

The communication model introduces the suggested forms of inter-domain and intra-domain communication. Basically, inter-domain communication is encouraged through special communication RMs. Communication within a domain is via shared memory, streams and DTP communication protocols (not specified). X/Open is still defining portable application interfaces for the DTP communication model. Nested transactions are supported in the communications model.

Reference.

other X/Open applications.

This document is aimed at application developers, who wish to write portable programs that use "global" transactions. Global transactions are best described as distributed nested transactions (reviewer's opinion). Naturally, the document is co-requisite reading for such people. The document is meant to be read in association with other relevant X/Open documents (itemised in the document). The document achieves its limited purpose of specifying the TX interface.

The document firstly positions the TX in the broader scope of the X/Open DTP model. This is followed by an overview of the TX interface. The overview is terse and no justification of the introduced features is presented. Having said that, the model itself seem to be quite general and useful.

The detailed description is presented as a C language header file followed by Unix manual page, C library style descriptions for each routine in the TX interface. This is followed by Unix manual page, Cobol library style descriptions of the routines. Nothing equivalent to a header file for Cobol is presented. This appears to be an oversight. Furthermore, no indication of why the particular combination of C and Cobol were chosen to present the TX interface is given.

On the positive side there is a useful state transition table that shows the expected calling sequences for routines in the TX interface. This overcomes one of the problems with the Unix manual page method of presenting information. Namely, TX interface users can determine from the document, not only what the routines do, but also in what order they should be called.

As there is no base of TX interface conformant applications, the authors might have presented an example demonstrating a hypothetical TX interface conformant application. This would show potential application developers the steps required to implement an such applications without have to wade through all the interface descriptions and the state transition table.

Systems Management:
Management Protocols API (XMP)

by X/Open Company Ltd.
204pp., (Soft Cover)
ISBN 1-872630-32-4

Reviewed by
David Hughes
Bond University
<bambi@Bond.edu.au>

The thought of curling up on a cold, rainy evening with a copy of a preliminary X/Open API specification is not the thing of which dreams are made. This books isn't exactly what one would call "a good read" unless you are of the habit of leaving copies of RFC's by your bed for a bit of light reading. That said, the material covered will be of interest to those of us who work closely with network and systems management.

The X/Open Management Protocols API (XMP) is a specification for providing a common API for accessing management information. The framework caters for the two most popular and deployed management protocols: SNMP and CMIP. Although there tends to be a bias towards the OSI way of doing things throughout the specification (and also in the terminology used by the book), the Internet management framework is covered well.

The style adopted by the book is the usual, dry, standards-speak that we have come to expect from a specification of this kind. It presents the material covered in a well organised, three part approach including 40 pages of textual description, 110 pages of function and interface reference, an the remainder of the book dedicated to example code, possible error conditions and a good sized glossary of the terminology gleaned from OSI, other X/Open specifications and the management community in general.

While reading through the spec, I started wondering if this API was just another attempt by a standards body to formalise an emerging area of our field and how it was being viewed by the vendors and researchers alike. The API covers key areas such as management services, session maintenance, synchronous and async management approaches, and management contexts. It does not, however, attempt to deal with the question of security within management.
frameworks. After a little prodding around on
the net, it appears that the API has received
support from both the OSF and HP. Apparently,
the OpenView Distributed Management
Developers Kit offers an XMP interface to the
CMIP and SNMP implementations available
within that environment. The much publicised
Distributed Management Environment from OSF
will also offer an XMP compliant interface to
the developer.

Seeing as there is a level of support from two of
the major players in the management game, this
API may become the programmatic standard for
management applications. As such, this book
should be of interest to anyone wishing to utilise
the API through the HP product or just wanting
to keep in touch with developments in the
management world.

Learning the Korn Shell

by Bill Rosenblatt
O'Reilly & Associates, Inc.
June 1993, 338 pages,
ISBN 1-56592-054-6

Reviewed by
Gordon Turner
<gordont@dialix.oz.au>

Yet another O'Reilly book, do we really need it?
My answer is yes. Having worked with several
shell's, including the standard Bourne shell, the
Berkeley csh, and public domain offerings like
tcsh and bash, reviewing the book would answer
the question, what makes the Korn shell
different, and why would one want to use it?

The Korn shell was developed by David Korn of
AT&T Bell Laboratories in the mid 1980's. The
Korn shell was distributed as part of the
"Experimental Toolchest" in 1986. Eventually it
was distributed in SVR4. The version described
in the book is from 1988. Typically most
vendors versions are from this release. The Korn
shell is obtainable from USL, at a cost, there is a
public domain version available, which lacks
some of the features but is otherwise a functional
Korn shell.

The first few chapters and it was clear that the
Korn shell could replace all the other efforts.
With command line editing (in vi or emacs
style), aliases, history, job-control, csh syntax,
Bourne shell almost compete compatibility†,
what more could you want. A scripting
language of course, and with Korn shell one
could almost do away with perl :-)

Details of the enriched scripting capabilities are
described in good detail. Including the basics of
a shell script debugger. All this could make the
book worthwhile. Moving to SVR4 with Korn
shell will certainly make life easier.

The book as are most of the O'Reilly series, is
set out in an excellent manner. Each chapter
builds on the knowledge from the previous. For
those experienced at using one or more of the
Unix shells interactive or in scripting it is easy
to jump into any chapter and learn how the Korn
shell can be used.

The book also represents a good learning tool on
using the Unix shell, script programming, and a
number of other concepts such as writing a
compiler. Particularly useful to a computer
literate person coming to unix for the first time.
Personally I rate the book at 8 out of 10.

† For the one non-compatibility read Appendix A pg. 292
(if you cannot get your hands on a copy then E-mail me)
20% DISCOUNT TO AUUG MEMBERS

Please send me a copy/copies of the following books —

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   ISBN: 0134742222, Cloth, 1993, RRP $49.95

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The following letter is reprinted from AUUGN Volume 1 Number 1. As this letter from Phil McCrea shows, Australia has a long history of work in Unix, and our president has a long connection with AUUG.

Dear Brian & Ria,


Sorry to hear the Cybers are playing up. We have a PDP10 here at Essex, although most of our stuff is on PDPIIs, under Unix, of course! We had a Unix User's group meeting here yesterday - the European user's group. Mostly English & Dutch, and a couple of Frenchmen. Unix is not terribly popular outside England and Holland - in Europe, that is! Most universities seem to have it in England. BUT the main thing about the meeting is that UNSW is the undisputed leader as far as UNIX software goes! The number of references to NSW was staggering. Discussing NSW software etc. The final motion was to standardize on NSW software all throughout Europe! Really gave me a feeling of pride. Andy Tanenbaum from Vrijie was there - has put together a new super high speed Pascal compiler - several times faster than Berkeley Pascal. Almost as fast as C! Optimization etc. Double precision. We got a copy and people have generally agreed to use it instead of C for system program.

Even Tanenbaum, who is actually an ex-patriot yank, made frequent and reverent mention of the NSW software! Pass this news on to Murray and John L, if you wouldn't mind. Mention was made of John Lion's and Greg Rose's papers in SIGART on operating systems - whatever issue it was! I'm sure if John Lions were to take a trip to Europe here, he'd be treated like royalty - well, amongst the Unix community anyway!


Phil McCrea
LINUX — An Open system Opened

Peter Chubb
Softway Pty Ltd

February 12, 1993

Abstract

The question to ask with all the hype about open systems is, “Open to whom?” Most proprietary “open” systems are frozen to input from ordinary people.

LINUX is a Posix conformant operating system that runs on 386 and 486 machines. It has almost all the features one could ask for in an open system: comes with full source code, free (in both the GPL and monetary senses), wide support via the Internet, many utilities and applications; it has multiple filesystems (including /proc and MS-DOS filesystems), sockets and TCP/IP, SCSI disc, tape and CD-ROM support, virtual memory, a MS-DOS emulator, etc., etc., etc.

LINUX has been developed cooperatively by many people world-wide. It isn’t too late for your contribution to make it into the system — you can’t get more open than that!

1 Introduction

There has been a lot of hype about open systems. People have given many definitions, including things like:

- An Open System is one that conforms to de facto or de jure standards that have been created with input from the wider community.
- An Open System is one that has been developed according to an Open Process.
- An Open System is one that can communicate using the OSI communications protocol stack.
- An Open system is one that is available from more than one vendor.
- An Open System is one that comes with source.
- Whatever an Open System is, ‘our system’ is (for ‘our system’, replace any vendor’s system, depending on who one talks to).

It’s clear that today, when used by computer vendors, ‘Open System’ means UNIX or UNIX-lookalike — except when used by a salesman from Microsoft, when it means NT. However, the idea of an ‘Open System’ obviously involves the idea that more than one person or group of people can be involved in its creation; that it is not restricted to a particular vendor’s hardware, and that it can communicate with other systems. Also, the idea that ordinary people can have input into the system.
Now, Unix once upon a time was an open system by all these definitions. Source licenses were relatively cheap; people working more-or-less on their own could provide patches to the system; and so on. Now, however, one needs a small fortune and a lot of free time to do anything off one's own bat that will make it into 'official' Unix.

2 Unix lookalikes

In recent times, with BSD386 and Linux, Open Systems live again. People can start hacking kernels with a fair chance that anything worthwhile might make it into the 'official' releases.

3 Linux

In early 1991, Linus Torvalds decided to create a Unix-like operating system that, unlike Minix, provided some of the advanced features of a modern Unix (such as paged virtual memory). To do this, he started with an Intel 386 box running Minix (as an aside, the most stable of the file systems available under Linux is the Minix filesystem).

He made this available to the world in November 1991, as Linux version 0.10. Since then there have been one to four updates a month, as Linus has been both writing code himself, and integrating code from other people. Because the source has always been available, people all around the world have been trying to get it to work on their machine - which has meant that drivers for SCSI discs, ethernet cards, and VGA cards have rapidly become available for most common varieties. Also they have been busy adding the features they most want - TCP/IP, better file systems, user level code, etc.

Currently, Linux has the following features:

- File system switch, with Xenix, Amigados, Extended, Minix, /proc and two or three experimental file systems.
- TCP/IP
- NFS - a kernel client, and a user-level server.
- Virtual memory, swapping either to a dedicated partition or to a file, and paging text directly from the program image.
- Shared libraries, with jumptables so that libraries can be upgraded without recompiling all the programs that use them.
- Copy-on-write fork.
- Gnu utilities, including gcc 2.3.3.
- X11r5 (it's the XFree 1.2 release)
- TeX and groff typesetting systems.
- University Ingres database system
- etc., etc., etc.
4 Architecture

The kernel falls quite neatly into a number of parts. These are:

- The file systems
- The memory system
- The network code
- The rest.

The directory tree looks like:

$ ls -F
COPYING Makefile.old boot/ init/ mm/
Configure README config.in kernel/ net/
Image System.map fs/ lib/ tools/
Makefile TAGS include/ makever.sh

$ ls -F fs
Makefile fcnt1.c ioctl.c namei.c read_write.c
block_dev.c fifo.c isofs/ nfs/
buffer.c file_table.c locks.c open.c stat.c
exec.c filesystems.c minix/ pipe.c super.c
ext/ inode.c msdos/ proc/

$ ls -F net
Makefile socket.c tcp/
kern_socket.h socketcall.h unix.c

At the top level are the directories boot, fs, include, init, kernel, lib, mm, net and tools. There are also the files Makefile (to make the kernel), and Configure, a shell script that configures the Makefile. Other files are either generated by Configure (.depend, .config) or are documentation files (COPYING, which contains the Gnu Public License, README which is almost always out of date).

4.1 boot

The boot subdirectory contains code used while booting Linux, including the boot sector itself. The boot sector is loaded at 0x7c00 by the boot loader. It then relocates itself to 0x90000 and uses BIOS routines to load the code in setup.S at 0x90200, and the Linux kernel at 0x10000. Setup.S then gets information about the system from the BIOS and overwrites the boot-block with it. This information includes the kind of discs attached, the kind of VGA card available, the amount of memory, etc. It proceeds to set up the interrupt control system, and the initial memory map for kernel mode: it maps the virtual addresses so that the loaded kernel is at location 0, then branches to it.

The kernel starts with the code in head.S, which does yet more setup (determining whether the CPU is 386 or 486, determining whether the kernel needs to emulate a FP coprocessor, etc), and eventually invokes main().
4.2 kernel

The kernel directory has subdirectories containing the block and character device drivers.

4.3 fs

Within the fs directory are subdirectories for each of the supported filesystems, and files containing glue for all the filesystems.

Filesystem-related system calls come into the generic code, and are passed off through a filesystem switch. Each part of the filesystem (superblock, inodes, open files) has a pointer to an array of function pointers for the various operations (see figure). Rather than each filesystem declaring an inode structure for itself, that is kept as part of a vnode (as is done in BSD and SVR4), data is translated to a canonical form when it is read from the disk, and translated back again when written. This leads to less code duplication than the alternate approach, but does add some runtime overhead. As you can see from this, the kernel is designed to be compiled with an ANSI C compiler (gcc 2.3.3, to be precise).

The most interesting filesystem is proc. This is a plan-9-style /proc filesystem, which looks like this:

```
$ ls -F /proc
1/ 28/ 4548/ 53/ 5576/ 5728/ loadavg version
1972/ 3/ 4549/ 54/ 5577/ 5761/ meminfo
1973/ 43/ 4550/ 55/ 56/ 5911/ self/
2195/ 45/ 4560/ 5575/ 5727/ kmsg uptime
```

The directories that have numeric names correspond to processes; other 'files' give information about the kernel. For example, if /proc/uptime is cat'd:

```
$ cat /proc/uptime
612891
```

it yields the seconds since last boot; if /proc/meminfo is examined, the display produced is:

```
$ cat /proc/meminfo
Mem: 15785984 12840960 2945024 3080192 6291456
Swap: 16773120 262144 16510976
```

The directory self refers to the process that opens it. Within each process directory are subdirectories and magic files:

```
$ ls -l /proc/1
total 3
-rwxr--r-- 1 root root 0 Feb 9 15:44 cmdline
-rwxr--r-- 1 root root 0 Feb 9 15:44 cwd -> [0802]:1
-rwxr--r-- 1 root root 0 Feb 9 15:44 environ
-rwxr--r-- 1 root root 0 Feb 9 15:44 exe -> [0802]:375
-rwxr--r-- 1 root root 0 Feb 9 15:44 lib
```

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struct file_operations {
    int (*isize) (struct inode *, struct file *, off_t, int);
    int (*read) (struct inode *, struct file *, char *, int);
    int (*write) (struct inode *, struct file *, char *, int);
    int (*readdir) (struct inode *, struct file *, struct dirent *, int);
    int (*select) (struct inode *, struct file *, int, select_table *);
    int (*ioctl) (struct inode *, struct file *, int, select_table *);
    int (*mmap) (void);
    int (*open) (struct inode *, struct file *);
    void (*release) (struct inode *, struct file *);
};

struct inode_operations {
    struct file_operations * default_file_ops;
    int (*create) (struct inode *, const char *, in, struct inode **);
    int (*lookup) (struct inode *, const char *, int, struct inode **);
    int (*link) (struct inode *, struct inode *, const char *, int);
    int (*unlink) (struct inode *, const char *, int);
    int (*symlink) (struct inode *, const char *, const char *, int);
    int (*mkdir) (struct inode *, const char *, int, int);
    int (*rmdir) (struct inode *, const char *, int);
    int (*mknod) (struct inode *, const char *, int, int, int);
    int (*rename) (struct inode *, const char *, int, struct inode *, const char *, int);
    int (*follow_link) (struct inode *, struct inode *, int, int, struct inode **);
    int (*chmod) (struct inode *, char *, int);
    int (*truncate) (struct inode *);
    int (*permission) (struct inode *, int);
};

struct super_operations {
    void (*read_inode) (struct inode *);
    int (*notify_change) (struct inode *);
    void (*write_inode) (struct inode *);
    void (*put_inode) (struct inode *);
    void (*put_super) (struct super_block *);
    void (*write_super) (struct super_block *);
    void (*statfs) (struct super_block *, struct statfs *);
};
When examined, they yield:

**cmdline** gives the commandline that the process was invoked with.

**cwd** is a magic symlink to the current working directory of the process. A readlink on the symlink gives the device and inode pair in the form shown ([0802]:1 means inode 1 on device major 8, minor 2). Likewise for **root** and **exe** which give the current root directory, and executable file respectively.

**lib** contains a similar magic symlink for each mapped file (usually shared libraries, thus the name).

**fd** contains more magic symlinks, one for each open file the process has.

**mem** when opened, gives access to the memory image of the process.

**stat** and **statm** give process state, and

**env** gives all of the process's environment.

### 4.4 net

In the **net** subdirectory are the socket interface and a subdirectory for each network type. My system has only tcp; others may have AX25, etc., as well.

The tcp code is based loosely on that from the BSD-NET release; likewise, the utilities are from that release (modified to run in a POSIX environment)

### 4.5 mm

**Mm** contains the memory management code. There are only three files (around 2000 lines) altogether. These provide swapping, the mmap system call and support for shared libraries.

The memory code relies heavily on the facilities of the Intel 386 memory-management system. It is probably the least portable part of the system as a whole.

As far as possible pages are shared between processes, marked copy-on-write where necessary. A typical output from the 'free' command is in the figure. Starting 15 copies of /bin/sh changed this to: Pages migrate between the buffer pool and other uses as necessary — there is no fixed size buffer pool.

Processes are fully demand-paged. However, paging activity only occurs when there is no free space: this leads to bumpy performance when memory gets tight, but is generally fine.
4.6 tools and lib

The remaining directories (tools and lib) contain tools for building the kernel image from its boot block and the rest of the code (by concatenating and patching) and a small subset of the C library for use when building and testing the kernel.

5 Overall

Overall LINUX takes up around 4000 lines of assembler, 66000 lines of C, and 12000 lines of header code (including all device drivers, all filesystems and the floating point emulator). This leads to a kernel around 400k big (stripped), that takes 12 minutes to build on my 486/50. Around 4 minutes of this is spent in disc I/O, as the ultrastor driver is not yet very efficient, and only works at around 250K/sec instead of a theoretical 700K/sec — the Makefiles invoke sync between each major section, which slows the process down.

6 Conclusion

I find the system quite usable for most purposes. It seems quite fast, and is small enough to understand. It has the utilities and programs I need. from Spice through emacs and \TeX to X-\Windows (although, because my card is not supported, I either have to write a driver for it or live with monochrome X).

I'm typing this document using Epoch on an X-terminal attached by ethernet to the LINUX box, using a dos emulator and \TeX in other windows. I'm using the machine for reading mail, (sendmail compiled almost straight out of the box), but I haven't installed Cnews or an NNTP newsreader yet, although both are available. Using FTP and Epoch with ange-ftp, I can use the LINUX box to edit files anywhere that tcp/ip is available from our system.

So overall — it's free and it works, and is open. By whatever definition you care to choose!

7 Where can I get it?

This document would not be complete without letting you know how to get LINUX for yourself. The easiest way is to use anonymous FTP to fetch the Soft-Landing-System (SLS). It's available at:

- kirk.bu.oz.au:/pub/OS/Linux/packages/SLS/*
- tsx-11.mit.edu:/pub/linux/packages/SLS/*
- sunsite.unc.edu:/pub/Linux/SLS/*
It contains 30 discs:

1. core (disks a1-a4) What you need to get going.
2. base (disks b1-b7) Extras — more libraries, man pages, networking, text processing, etc.
3. Compiler (disks c1-c3) Gcc 2.3.3 — including C++.
4. documentation (disks d1-d2) Info and man pages for all the utilities.
5. sources (disk s1) Sources for things that are kernel dependent, likely to have to be changed, or hard to find elsewhere.
6. text processing (disks t1-t3) TeX, LaTeX, etc.
7. X-Windows (disks x1-x6) The XFree 386 release.
Distributed Object Management

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ABSTRACT

In this paper we would like to highlight some technical aspects of object management in a distributed environment, its implementation and its influence in software development.

Object oriented design is seen as the most promising way to get better software and to reuse its components. The management and storage of networks of objects and methods are a new development in computer science. Thus a consortium called Object Management Group (OMG) is formed, which has members all over the world.

The Object Management Group defines an architecture to transparently manage objects in heterogeneous distributed environments.

An object system as a collection of objects provides services to clients by a well-defined interface. The OMG (concrete) object model specifies the structure of this interface both to client requests and the object implementation. An Interface Definition Language (IDL) allows to completely describe the object interface with all its methods.

The Object Request Broker (ORB) provides the mechanism to locate the appropriate object implementation and sets up the communication path for client requests. The ORB itself is defined by its interfaces. An implementation can be directly linked into the client and object code, run as a server or be embedded into the operating system.

The architecture is also open to integrate different types of implementations of object systems such as object libraries or object oriented database systems (OODB).

Computer Networking has matured during the last years. We have got facilities to do efficient and standardised communication between heterogeneous systems.

The socket transport interface appeared in 4.2 BSD first. This simple but powerful network interface opened the software world to a whole class of new applications independent of the underlaying physical network today. Sockets have been superseded by the X/Open Transport Interface (XTI).

Different hardware architectures are using incompatible data type representations. The presentation layer service External Data Representation (ONC-XDR) solved this problem by definition of a common network data type representation. Remote Procedure Calls (ONC-RPC) prepare the easy way into client server applications. One of the most popular packages is the Network File System NFS.

RPC/XDR is bundled with a definition language to specify data types and procedure calls at a higher level. A protocol compiler (rpcgen) creates the appropriate C code including all stubs required for the client and the server process will be created.

Object oriented design, programming and development is nothing new. SmallTalk as a pure object oriented language has been developed by Xerox PARC since the early 1970s and is available since 1980. Today the preferred language for object oriented programming is C++. Many C users see C++ as an
enhanced C or just the next revision. This is an easy step into the object oriented world, even when C++ is considered more a class oriented than a true object oriented language.

Modern "object oriented" network concepts have changed the view of a network. It is no longer seen as a number of computers providing different services, but a set of objects.

Today it is generally impossible to have direct access to another applications data. Systems are open up to the networking level only. Most of the applications are still closed to their own environment.

None of the RPC derivates does give any support for this level. New mechanisms are required to open distributed applications and to allow interaction between applications. Several companies have recognised this problem.

The Object Management Group (OMG) was formed in April 1989 by a group of vendors and user organisations as a non profit organisation. The organisation "is dedicated to maximising the portability, reusability and interoperability of software. The OMG is the leading world-wide organisation dedicated to producing a framework and specifications for commercially available object environments."

The OMG has more than 300 members today including names like Sun Microsystems, Digital Equipment Corporation, Hewlett-Packard, OSF, Microsoft. OMG itself employs very few people. Most of the work is carried out by members.

The first major result of the OMG has been the Object Management Architecture Guide (OMA). It describes an abstract object model, an architecture to implement distributed applications. The object management architecture is structured into four components:

- Object Request Broker
- Object Services
- Common Facilities
- Application Objects

The Object Resource Broker

Communication between objects is done by requests and results. The application object is able to use services of the Common Facilities by sending a request to these objects. Requests are independent of the executing machine. The
underlying network and machine architecture are fully transparent to the application. This is guaranteed by the Object Request Broker (ORB), the central component of this architecture. Services provided by the ORB are:

- the Name Service to identify an object within the network,
- the Request Dispatch Service to decide which method of an object has to be called,
- the Parameter Encoding to have a unique data representation over the network,
- the Delivery Services to allow correct transport of requests and responses,
- the Activation to implement persistent objects,
- the Exception Handling to deal with error conditions and other unexpected situations,
- and the Security Services to identify communication partners.

* Object Services

Object Services provide basic functions to manage objects within a network environment. These are functions to create and manage classes and instances and to implement persistent objects. On a local level this type of functionality is provided partially by object oriented programming languages.

* Common Facilities

Common Facilities provide all functions of general characteristics required by many applications. They can be seen as a common class library. The application developer can use them to create his own classes tailored to the specific requirements.

* Application Objects

Application Objects summarises all types of applications based upon the OMA providing or using services of the system. Some types of applications are:

- CAD applications,
- CASE systems,
- network management applications.

OSF DME (Distributed Management Environment) and USL Atlas are concepts based on OMA.

**Common Object Resource Broker Architecture**

Two groups with HP, NCR, Object Design, Sun in one and DEC, HyperDesk in the other developed their own definitions of an ORB like implementation. Within the Object Request Broker Task Force they agreed to a common strategy in 1991, the Common Object Resource Broker Architecture (CORBA). It is a

![Object Request Broker Diagram]
Distributed Object Management

concrete object model based on the Object Management Architecture. The document describes a binding definition of an ORB.

Two different types of interfaces are provided for the client. Both types of interface have the same capabilities.

The Dynamic Interface provides an interface repository to retrieve an interface definition at run time to call a method of an object. No static calls have to be created. The caller does not even need to know where the object is located (whereas ONC-RPC users have to know where the server is located!).

The Stub Interface is usually created by an Interface Description Language (IDL). The IDL compiler creates the interface for both the client and server side. This mechanism is very similar to the rpgen program creating RPC stubs and header files.

IDL

The object interface is specified as a formal description of a calling structure. The IDL syntax is very close to C++. A few extensions have been made to describe an interface in a distributed environment. IDL distinguishes between input, output and input/output parameters. An IDL interface definition is similar to a C++ class. Specifications of one interface can be inherited from other interfaces.

A compiler translates the definition into the target language. The C language mapping is specified in the current CORBA document. It shows how to translate each IDL construct into C language.

A public domain IDL compiler is available. It creates an intermediate language.

Object Adapter

A generated server interface is used to call object implementations from the ORB. The object itself is able to request services from the ORB via the Object Adapter. The Object Adapter is the real interface to the ORB for an object implementation.

Object adapters have the following responsibilities:
- generation and interpretation of object references
- method invocation
- security of interactions
- object and implementation activation and deactivation
- mapping object references to the corresponding object implementations
- registration of implementations

Services not provided by a specific ORB core implementation have to be implemented in the object adapter to guarantee the same interface functionality to the object implementation.

Any special requirement needed by an object implementation have to be implemented in the object adapter (for example registration of multiple objects of an OO database in one call). This allows also performance tuning.

Examples of object adapters are:
- Basic Object Adapter
  This adapter type can be used for most object types.
- Library Object Adapter
  It is used for library objects linked to the client's program.
- Object-Oriented Database Adapter
  A special adapter tuned for OODBs.

Object Resource Broker

The CORBA document allows different implementation strategies for the ORB. Objects have very different requirements how to interface the ORB depending on the object model used.
The ORB is defined by its interface only. It can be implemented as a single component, but there is no requirement for it.

Some examples how to implement an ORB are:
- **Client- and implementation-resident ORB**
  The ORB code is linked to the client. Interprocess communication (IPC) is used to access the object implementation.
- **Server-based ORB**
  The ORB is implemented as one or more server programs. IPC is used to communicate with clients and object implementations. The ORB is responsible for routing of requests between client and object implementation.
- **System-based ORB**
  The ORB is integrated into the operating system as a part of it.
- **Library-based ORB**
  "Light-weight" objects can be implemented as a library and linked into the client code. In this case the stubs are the object implementation itself. The object implementation has to trust the client not to damage its data as they share the same address space.

A client is not necessary restricted to access one ORB only. If different ORBs are able to work together, the client may use them simultaneously. Different styles of object references have to be resolved by the ORB.

The interface is organised into three categories:
- operations that are the same for all ORB implementations
- operations that are specific to particular types of objects
- operations that are specific to particular styles of object implementations

A request consists of
- an operation (name),
- a target object,
- zero or more parameters (data for target object),
- an optional request context with additional information about the request.

An exception is returned, if any abnormal condition occurred during the execution of a request. A request may return a single result value.

**Objects**

Objects are invoked by usage of the object reference, implemented as a language specific data type. The stubs convert this type, usually an opaque pointer, to the representation required by the ORB.

Object references can be received as an output parameter from another object invocation or an input parameter if the client is an object implementation itself. A string representation of an object reference can be used to identify an object in the ORB without linking to a local implementation.
object reference can be used for permanent storage.

- **Object Implementation**

A set of data and code is required to implement the object itself. The implementation can use other object to implement its functionality. Some ways of implementation are

- (OO) libraries,
- servers,
- a program per method,
- an encapsulated application,
- an object-oriented database.

Encapsulating existing applications allows their integration into an object-oriented environment and their usage together with newly developed OO applications. This approach will especially enable the further usage of the major mainframe applications within the object-oriented world.

- **Basic Object Adapter**

A standard object interface is specified in CORBA, the Basic Object Adapter (BOA). It should be available in every ORB implementation.

The main services provided by the BOA are

- Generation and interpretation of object references
  Unique references are used to identify an object.
- Identification and authentication of the calling client

- Activation and deactivation of an object implementation

---

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The BOA has to implement persistent objects. This means permanent storage of objects (hard disk, etc.), write back of modified data.

- Calls of methods by usage of generated stubs
  - There are different ways to activate a method:
    - Each method is an own program
    - Each object with all its methods is implemented as a program
    - A program implements an object and all its instances

The BOA interface is mainly specified in IDL notation.

There are four different ways to activate an object implementation, also called activation policies:

- **Shared server policy**
  The BOA starts the server process for a number of object implementations when the first request is performed. As soon as the process is ready, it will register to the BOA.

- **Unshared server policy**
  The server process implements only one object.

- **Server-per-method policy**
  For each request, a new server is started.

- **Persistent server policy**
  The server process is started outside the BOA. Otherwise it acts like a shared server.

The way of communication between the BOA and the object implementation is not specified in CORBA. They are very dependant on the system and language environment used. The information required to connect to the object implementations is stored in the Implementation Repository. CORBA does not contain any further specification about the interface to it.

---

**Interface- and Implementation Repositories**

![Diagram of Interface- and Implementation Repositories](image-url)

**Multiple ORBs and Integration of Foreign Object Systems**

CORBA allows to have multiple Object Request Brokers. The same ORB (ORB1 in next figure) can be active on different machines using the same object references and communication methods. They act like a single ORB. Object references can be transferred between the different machines.

One client can use objects from more than one ORB (ORB1 and ORB2 in figure). Object references can be passed as parameter between the different ORBs. The ORB has to be able to distinguish between its own and others object references.
If two machines do not have any common ORB, a gateway is required to translate the object references and requests.

**Multiple ORBs**

Today there are many "non CORBA" object systems available. To integrate them into a CORBA environment, three different approaches are possible:

- Mapping of foreign system into ORB objects (BOA objects)
  The foreign object system is seen as one or more objects interfaced by a basic object adapter.
- Usage of special object adapter
  If the BOA is not suitable as an interface, a special object adapter can be used as interface.
- ORB Gateway
  The foreign object system is seen as ORB. A gateway translates between a CORBA ORB and the foreign ORB.

**Different Ways to Integrate Foreign Object Systems**
Distributed Object Management

Future Development RF1/RFP

The CORBA 1.1 document has not covered a number of areas. To fill these gaps the OMG issues Requests For Information (RFI). The response is used to prepare a Request For Proposal (RFP).

In January 1993 the OMG released the RFP C++ Language mapping request for proposal.

The C++ mapping will be the first object-oriented language mapping for the CORBA standard.

Special requirements are
- reliability to make sure incorrect IDL code does not corrupt the IDL language mapping,
- performance,
- portability to be independent of specific C++ implementation.

The final specification is scheduled for end of 1993.

A new CORBA 2.0 version is planned. Together with the C++ language mapping a RFI ORB 2.0 Extensions has been released. It is due end of April 1993. Responses will be reviewed by Technical Committee (TC) "Object Request Broker 2.0 Task Force" (ORB2TF). The next step will be a RFP, scheduled for July 1993.

The addressed areas are:
- Areas in CORBA deliberately left incomplete (repository APIs)
- Additions to CORBA (additional language binding)
- Extensions to core ORB (transaction, concurrency generation)

Suggested response topics are:
- Multi-media (images, animation, video, speech) as streams of data
- Interoperability (high priority)
  - Definition of interoperability
  - Requirements and expectations for interoperability
  - Expositions on general approaches to interoperability
  - Discussion of specific mechanisms and protocols for interoperability
- Other language bindings
- Object adaptors
- Repositories
  - Interface repositories (current CORBA: extract operations only, no insert, modify)
  - Implementations repositories (no operations specified currently)
- Transactions
- Asynchronous messaging
- Multi-endpoint interaction and replication
- Concurrency
- Relationship to standards (for example ODP effort in ISO)
- Compliance and testability

Further topics for RFIs/RFPs are language bindings for ADA, COBOL and SmallTalk, interoperability between ORBs, asynchronous messaging.
References
A Small Guide to Intrusion Handling

by Bjorn SatOeva
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Somebody broke into your site over the weekend, so what are you going to do now? This is an awful question to face, especially if you are not prepared. In this article I will explore some of the issues involved handling an incident. However, since I am not an attorney, I would urge you to contact your company's legal department to discuss these issues in more detail.

All organizations should have a plan for what to do if an intrusion incident occurs. An old Chinese proverb says “It is a foolish man who first starts to dig the well when he gets thirsty.” Of course, while it is impossible to plan in advance for the exact circumstances, it is easy to determine who the players are and who should be involved in untangling the situation. Of course, the question “How do you know you have been hit?” is, by itself, a very large issue. For now I will presume that you have either wired your gateway with bells and drums, or that you had been notified by a system administrator from a neighboring site that your site had been compromised.

Once a break-in has occurred, the subsequent actions that need to be taken can be split into the following steps:

First, don't panic. Much more damage can be done by sysadmins who have lost their heads than by an intruder. So before doing anything else, determine whether you really have an intrusion, keeping in mind that files and accounts can be created silently when you install an application.

When you have verified that your site actually has been hit, coordination will need to be set up within your site. If your site has set up a local Computer Emergency Response Team (CERT), this will be the group to contact. If not, you can contact the National CERT team at Carnegie Mel-lon U. (Tel: 714/268-7090). You will also need to decide which law enforcement agency should be contacted to catch the cracker. (See below.)

Don't panic.

You should then decide if you want simply to lock out the cracker or if you intend to track him down. Consult your legal department before deciding on the latter course, as your company might be liable in a civil suit filed by a site assaulted when the cracker was operating from your site. There has, to my knowledge been no law suits originating from downstream liability. CERT has been telling sites under attack to call their downstream sites, inform them of the circumstances, and let them decide their course of action.

Sooner or later, the day comes where either you have had enough, or when enough evidence has been collected, and the cracker will be locked out of your site. After the holes have been closed, you will need to do a complete recovery. At a minimum, all executables will need to be verified as being the correct ones, and all configuration files in /etc are correct. Don't just do a reinstallation and then dump all the old files in /etc onto the newly installed machine, as there could easily be hidden changes to, for example, rc boot files or the passwd file.

And finally, everyone should be notified that it is over and things are back to normal. This last step is often forgotten. Not doing so is impolite to your neighboring sites, which have been forced to ‘alert’ status during the incident, as well as anyone else who might have been involved.

Make sure you have set up a firewall.

The very best scheme, of course, is to avoid letting the cracker inside your systems in the first place. If you are on the Internet, make sure you have set up a firewall. This will remove most threats, while still allowing the users to maintain a reasonable working environment. If this is not possible, be aware of the biggest threat, which is users who have bad passwords. You can obtain Crack, a password cracker, from the CERT machine <ftp.cert.org>. This tool will enable you to find “bad” passwords in your password file. A better method is to install a new version of the passwd command that checks the quality of any new password before encrypting and storing it in the passwd file. One example of this is Matt Bishop's passwd+ (available at nic.funet.fi). It also important to realize that many (but not all) crackers do not know a lot about UNIX, but rather follow a cookbook approach when breaking into a site. This establishes a pattern, which makes the cracker identifiable.

Legal Aspects of Intrusion Handling

Computer crime has become a problem which is now being taken seriously by the federal government. Computer Crimes were originally handled by the Department of Justice Fraud Unit, where they received little attention as that unit also han-
dies insurance fraud, Medicare fraud, and
defense procurement fraud. A few years ago, it
was moved into General Litigation, where a
Computer Crime Unit, headed by Scott Charney,
was created.

One of the biggest problems the Computer Crime
Unit faces is educating attorneys. From a prose-
cuter’s viewpoint, most attorneys attended law
school before PCs became common, and most do
not yet understand the technology. The Com-
puter Crime Unit intends to educate the legal pro-
fession by encouraging them to learn the basics of
DOS, UNIX, and networking. It is hoped that they
will then be able to communicate knowledgeably
to a judge to get a warrant or to a jury to obtain a
conviction. The Computer Crime Unit is also
working on establishing connections to the tech-
nical community, so they can call in experts in
specific fields, when needed.

Another problem facing the Computer Crime
Unit is the assessment of the scope of the prob-
lems. Many crimes are not reported. For example,
banks do not like the publicity associated with a
computer crime and will often not report such
incidents. In many cases it seems to be cheaper to
handle the problem administratively. The press
has reported that the yearly losses are sometimes
around 500 million dollars, at other times as
much as 500 billion. Discrepancies this big in the
amounts reported means that nobody knows
what the true amounts are. The Computer Crime
Unit has been in contact with the national and
local CERT teams, and since last fall, US District
Attorneys are required to report any activity
related to computer crimes to the Computer
Crime Unit.

Use a common sense approach to the
law.

Another new step in fighting computer crimes is
that the federal law enforcement agencies are
starting to coordinate their efforts. Previously,
any reported computer crime would be investi-
gated by the local agency. This could lead to
many teams investigating the same cracker, e.g.,
one in San Francisco, one in Chicago, and a third
team in Boston. Nowadays if the three cases seem
to be caused by the same cracker, the agents from
the three cities will get together in order to solve
the crime. Also, the two federal agencies investi-
gating computer crimes, FBI and Secret Service,
now share their case lists.

Is computer crime a new kind of crime or is it just
the old kind of crime done in a new way? Accord-
ing to Charney, computer crime can be classified
in one of the following three categories:

Computers as the target of the offense. Examples of
this include PC viruses and UNIX worms, denial
of service attacks, etc.

Computers as tools of the offense. This category
includes embezzlement, e.g., rounding errors are
accumulated into an account of the embezzler.

Computers incidental to the crime. In the old days,
when the drug enforcement agency would kick
in doors with a search warrant, they would find
powder on the table, a stack of cash, and a little
black book, with names, addresses, amounts and
date of purchase. Today, the DEA is kicking in
doors, and there is the powder, the stack of cash,
and a stand-alone PC. In such cases, the com-
puter is incidental to the crime.

Of these, only the first is treated by Department
of Justice as Computer Crime. The other two are
old type of crimes, which just are using new
tools.

The Computer Crime Law

The United States has a computer crime law, The
Computer Fraud and Abuse Act of 1986 (which was
originally introduced in 1984, but amended in
1986), also known as 18-USC 1030. I will not
reprint the law here, but rather attempt to illus-
trate the practical aspects of the law, as it has been
explained to me. It is important that system
administrators don’t get lost in the legal lan-
guage, and use a common sense approach to the
law.

The 1030 act comprises six parts. According to
Charney, the first, 1030a1, has never been used
and will never be in its current form. The statute
prohibits someone from knowingly accessing a
classified computer without proper authoriza-
tion. The main reason for why the law will not be
used is that it requires the prosecutor to prove the
intent of the suspect, one of hardest thing to
prove. Other existing espionage laws contain
similar provisions, but do not require the proof of
intent.

The second, 1030a2 is intended to protect finan-
cial institutions and has little interest for most
other computer sites.

The third and fifth parts, 1030a3 and 1030a5, are
the most used statutes in this law, and perhaps
the most interesting for a system administrator.
These statutes deal with trespassing, and protect-
ing the computer from unauthorized access.
However, 1030a3 only applies to computers which are used (wholly or in part) for the federal government.

The fourth part, 1030a4 covers the use of federal interest computers in committing fraud. The definition of a federal interest computer is interesting: A computer becomes a federal interest computer if it is accessed by modem or through the Internet from another state. This definition allows the law to be used for computers owned and operated outside of the federal government, as long as it is in another state than the cracker. With today’s connectivity, this is the usual situation.

The fifth part, 1030a5 covers intentional access to a federal interest computer (which can be any computer) without authorization, and either altering, damaging, or destroying information, and thereby causing a loss of one thousand dollars or more during a period of one year (except for medical records, where there is no minimum dollar requirement). The one thousand dollars requirement is important, as the law allows lost computer time and cost of reprogramming to be included in the loss.

The sixth part, 1030a6 applies to the use of bulletin board computers.

Besides the Computer Fraud and Abuse Act, a number of existing laws are also used for prosecution. Two examples of this are the wirefraud act and 18 USC 1014. These statutes prohibit interstate transfer of stolen property. The latter is an old law, which was passed to prevent automobile theft, but is used here when a file is transferred illegally from a computer in one state to one in another. The wirefraud act has been used when someone uses interstate wires to access a computer without authorization. Here, the cracker has been connecting and misrepresenting his/her identity.

Still, the laws are very confusing to lay people. The task of law enforcement agencies and attorneys is to determine which statutes should be used for prosecution. The tasks of the System administrators is to be able to explain to them what happened and possibly who the intruder might be.

The International Aspect of Intrusion Incidents

Often the cracker is not from the United States. Obviously, it is much easier to make a domestic investigation vs. an overseas one. For instance, it is not possible to go into another country and seize evidence or suspects. In order to gain assistance in investigating such an incident, the government’s need to deem the crime as severe and important. In many countries, computers are not as common as they are in the United States, and thus they may not deem computer crime to be an important problem. However, countries like England, Australia, Canada, and the Netherlands are working together to solve these crimes, requiring liaisons between the law enforcement and treaties which stipulate mutual legal assistance.

Computer crime is a growing and complex phenomenon.

Another problem is, that even when the law enforcement agencies are working together across borders, there are big differences in the laws. Scott Charney has given as one example a foreign law enforcement agency that did not have any existing statutes like the 18 USC 1030, but decided to treat the login to a computer using another person’s account as forgery (the intruder was signing on as another person).

The Law Enforcement Agencies

On the federal level, there are two agencies, the FBI and Secret Service, that are involved in solving computer crime. The FBI actually comprises two parts, the Foreign Counter-Intelligence (to be contacted when classified computers are involved), and the White Collar Crime Division. Historically, the FBI has not been very active in solving computer crime. However, much has changed since Clifford Stohl was chasing the wily hacker, and today the FBI has been reorganized to better deal with this area. Agents from the FBI and Secret Service now work closely together on cases which involve both agencies. This eliminates any confusion for the system administrators about which agency to call, e.g., if you get hit, contact the agency which is easiest to get in touch with. In case of FBI, ask for the supervisor of the White Collar Crime Division.

Conclusion

Computer crime is a growing and complex phenomena. Learning more about it, its ramifications, and the legal issues surrounding it can make us more effective in our jobs.
4.4BSD Release

by Keith Bostic
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We are happy to send you information about our June 1993 release of 4.4BSD. This distribution is the final release that will be done by the Computer Systems Research Group (CSRG). For details on the demise of CSRG, see "The End of BSD from Berkeley" below.

This distribution is intended to be used on production systems; it has been run extensively at several test sites and has proven to be stable and reliable. However, because of the shutdown of the CSRG, there will not be anyone available at Berkeley to assist with problems, so it should not be used by sites without enough local expertise to find and fix any problems that are encountered.

The code in this distribution may be redistributed and used in released products provided that you abide by the due credit requirements listed in your license agreement. We have attempted to make the system as compliant with the POSIX 1003.1 and 1003.2 standards as was possible at the time of its release. We have not been able to run it through any of the verification test suites, thus, you should not claim conformance with either standard without first validating the code.

We had planned on releasing two versions of the software, 4.4BSD-Encumbered and 4.4BSD-Lite. Currently, we are releasing only 4.4BSD-Encumbered. The 4.4BSD-Encumbered distribution is available only to sites with UNIX/32V, System III, or System V source licenses with Western Electric, American Telephone and Telegraph (AT&T), or UNIX Systems Laboratories (USL). The 4.4BSD-Encumbered distribution is a complete distribution in the style of 4.3BSD and contains the complete source for the Berkeley Distribution.

The 4.4BSD-Lite distribution was to have been a distribution that was copyrighted by the University of California and others, but could be freely redistributed. It was to have been available to anyone and require no previous license, either from USL/Novell or The Regents of the University of California. Its license agreement and content would have been similar to that of the two BSD Networking Releases. However, USL has brought a lawsuit against the University and the University has voluntarily decided to withhold the distribution of 4.4BSD-Lite until the lawsuit is resolved.

The information below is designed to acquaint you with the details of our distribution so you can decide whether you would like to receive it. Order information is at the end of this article.

What is 4.4BSD?

This software distribution is provided on one 6250 bpi 1/2" 9-track tape or one 8 mm Exabyte cassette only. The 4.4BSD-Encumbered distribution contains complete source as well as binaries for one of the following three architectures:

- HP 9000/300 68000-based workstations
- DECstation 3100 and 5000 MIPS-based workstations
- SPARCstation I & II SPARC-based workstations

(Please note that the SPARC kernel will not run on the Sparcstation 1.0.)

If you wish to obtain binaries for more than one architecture, they may be purchased at the same time for an additional $500.00 fee.

The distribution supports a somewhat wider set of machines than those for which we have built binaries. The architectures that are supported in source form include:

- HP 9000/300 68000-based workstations
- Intel 386/486-based machines (ISA/AT or EISA bus only)
- Sony News MIPS-based workstations
- Omron Luna 68000-based workstations
- DECstation 3100 and 5000 MIPS-based workstations
- Sparcstation I & II SPARC-based workstations

The distribution does not include the machine support for the Tahoe and VAX architectures found in previous BSD distributions. Our primary development environment is the HP9000/300 series machines. The other architectures are developed and supported by people outside the University. Consequently, we are not able to directly test or maintain these other architectures, so cannot comment on their robustness, reliability, or completeness.

The major new facilities available in the 4.4BSD release are a new virtual memory system, the addition of ISO/OSI networking support, a new virtual filesystem interface supporting filesystem stacking, a freely redistributable implementation
of NFS, a log-structured filesystem, enhancement of the local filesystems to support files and filesystems that are up to \(2^{63}\) bytes in size, enhanced security and system management support, and the conversion to and addition of the IEEE Std1003.1 ("POSIX") facilities and many of the IEEE Std1003.2 facilities. In addition, many new utilities and additions to the C library are present as well. The kernel sources have been reorganized to collect all machine-dependent files for each architecture under one directory, and most of the machine-independent code is now free of code conditional on specific machines. The user structure and process structure have been reorganized to eliminate the statically-mapped user structure and to make most of the process resources shareable by multiple processes. The system and include files have been converted to be compatible with ANSI C, including function prototypes for most of the exported functions. There are numerous other changes throughout the system.

The new virtual memory implementation is derived from the MACH operating system developed at Carnegie-Mellon, and was ported to the BSD kernel at the University of Utah. The MACH virtual memory system call interface has been replaced with the mmap-based interface described in the "Berkeley Software Architecture Manual" (see UNIX Programmer's Manual, Supplementary Documents, PSD:5). The interface is similar to the interfaces shipped by several commercial vendors such as Sun, USL, and Convex Computer Corp. The integration of the new virtual memory is functionally complete, but still has serious performance problems under heavy memory load. The internal kernel interfaces have not yet been completed and the memory pool and buffer cache have not been merged.

The ISO/OSI Networking consists of a kernel implementation of transport class 4 (TP-4), connectionless networking protocol (CLNP), and 802.3-based link-level support (hardware-compatible with Ethernet®). We also include support for ISO Connection-Oriented Network Service, X.25, TP-0. The session and presentation layers are provided outside the kernel by the ISO development environment (ISODE). Included in this development environment are file transfer and management (FTAM), virtual terminals (VT), a directory services implementation (X.500), and miscellaneous other utilities.

A new virtual filesystem interface has been added to the kernel to support multiple filesystems. In comparison with other interfaces, the Berkeley interface has been structured for more efficient support of filesystems that maintain state (such as the local filesystem). The interface has been extended to include UCLA's support for stackable filesystems. These extensions allow for filesystems to be layered on top of each other and allow new vnode operations to be added without requiring changes to existing filesystem implementations.

In addition to the local "fast filesystem," we have added an implementation of the network filesystem (NFS) that fully interoperates with the NFS shipped by Sun and its licensees. Because our NFS implementation was implemented using only the publicly available NFS specification, it does not require a license from Sun to use in source or binary form. By default, it runs over UDP to be compatible with Sun's implementation. However, it can be configured on a per-mount basis to run over TCP. Using TCP allows it to be used quickly and efficiently through gateways and over long-haul networks. Using an extended protocol, it supports Leases to allow a limited callback mechanism that greatly reduces the network traffic necessary to maintain cache consistency between the server and its clients.

A new log-structured filesystem has been added that provides near disk-speed output and fast crash recovery. It is still experimental in the 4.4BSD release, so we do not recommend it for production use. We have also added a memory-based filesystem that runs in pageable memory, allowing large temporary filesystems without requiring dedicated physical memory.

The local "fast filesystem" has been enhanced to do clustering which allows large pieces of files to be allocated contiguously resulting in near doubling of filesystem throughput. The filesystem interface has been extended to allow files and filesystems to grow to \(2^{63}\) bytes in size. The quota system has been rewritten to support both user and group quotas (simultaneously if desired). Quota expiration is based on time rather than the previous metric of number of logins over quota. This change makes quotas more useful on file servers onto which users seldom log in.

The system security has been greatly enhanced by the addition of additional file flags that permit a file to be marked as immutable or append only. Once set, these flags can only be cleared by the super-user when the system is running single user. To protect against indiscriminate reading or writing of kernel memory, all writing and most reading of kernel data structures must be done using a new sysctl interface. The information to be access is described through an extensible "Management Information Base" (MIB).
The 4.4BSD distribution contains most of the interfaces specified in the IEEE Std1003.1 system interface standard. The biggest area of change is a new terminal driver. The terminal driver is similar to the System V terminal driver with the addition of necessary extensions to get the functionality previously available in the 4.3BSD terminal driver. 4.4BSD also adds the IEEE Std1003.1 signals, FIFOs, byte-range file locking, and saved user and group identifiers.

There are several new tools and utilities included in this release. A new version of make allows much-simplified Makefiles for the system software and allows compilation for multiple architectures from the same source tree (which may be mounted read-only). Notable additions to the libraries include functions to traverse a filesystem hierarchy, database interfaces to btree and hashing functions, a new, fast implementation of stdio and a radix sort function. The additions to the utility suite include greatly enhanced versions of programs that display system status information, implementations of various traditional tools described in the IEEE Std1003.2 standard, and many others.

We have been tracking the IEEE Std1003.2 shell and utility work and have included prototypes of many of the proposed utilities. Because most of the traditional utilities have been replaced with implementations conformant to the POSIX standards, you should realize that the utility software may not be as stable, reliable or well-documented as in traditional Berkeley releases. In particular, almost the entire manual suite has been rewritten to reflect the POSIX defined interfaces, and in some instances it does not correctly reflect the current state of the software. It is also worth noting that, in rewriting this software, we have generally been rewarded with significant performance improvements. Most of the libraries and header files have been converted to be compliant with ANSI C. The default compiler (gcc) is a superset of ANSI C, but supports traditional C as a command-line option. The system libraries and utilities all compile with either ANSI or traditional C.

Work has also progressed in several other areas. Several important enhancements have been added to the TCP/IP protocols including TCP header prediction and serial line IP (SLIP) with header compression. The routing implementation has been completely rewritten to use a hierarchical routing tree with a mask per route to support the arbitrary levels of routing found in the ISO protocols. The routing table also stores and caches route characteristics to speed the adaptation of the throughput and congestion avoidance algorithms.

The Kerberos (version 4) authentication software has been integrated into much of the system (including NFS) to provide the first real network authentication on BSD.

This release includes several important structural kernel changes. The kernel uses a new internal system call convention; the use of global ("umask") variables for parameters and error returns has been eliminated, and interrupted system calls no longer abort using nonlocal goto's (longjmp's). A new sleep interface separates signal handling from scheduling priority, returning characteristic errors to abort or restart the current system call. This sleep call also passes a string describing the process state, which is used by the ps(1) program. The old sleep interface can be used only for non-interruptible sleeps. The sleep interface (tsleep) can be used at any priority, but is only interruptible if the PCATCH flag is set. When interrupted, tsleep returns EINTR or ERESTART.

Many data structures that were previously statically allocated are now allocated dynamically. These structures include mount entries, file entries, user open file descriptors, the process entries, the vnode table, the name cache, and the quota structures.

The End of BSD from Berkeley

For the following three reasons, the CSRG clearly could not continue in its present form.

1. Funding had become increasingly time-consuming and difficult. We were spending more and more of our time obtaining funding, time that we would have preferred to spend working on BSD. As many of you are intimately aware, computer corporations are actively seeking ways to reduce discretionary outlays. Also, UNIX vendors have developed their own research groups, the work of the CSRG became less necessary to them. Finally, making BSD freely redistributable resulted in fewer distributions sold, as other organizations sold our releases for less money.

2. Support within the University of California declined as BSD became less widely used internally. Victims of our own success, many
of the features once found only in BSD are now available from every vendor.

3. The system has become too large and complex for a group of four to architect and maintain. In the last few years it became obvious to us that we had to expand the size of our group if we wanted to continue developing and distributing a complete UNIX system. Expansion was impossible given the external funding environment and the space constraints imposed by the university.

BSD has always been a community effort, and, as a community effort, does not rely on a small group of people in Berkeley to keep it going. BSD will not go away, but will live on through the free software and commercial efforts of many people.

We thank you for your support over the years, your funding, and, of course, the software you've contributed to make the BSD system what it is today!

Sincerely yours,
Marshall Kirk McKusick
Research Computer Scientist
Computer Systems Research Group

If you are interested in obtaining the distribution, please contact:

Pauline Schwartz, Distribution Coordinator
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System Administration Tools...

Your Vendor Never Told You About:
The Publication

by Elizabeth D. Zwicky
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System administrators in general live outside the academic “publish or perish” framework. On the other hand, there are few places where “publish and flourish” is not true. One system administrator of my acquaintance claims to have settled an argument with a particularly obstreperous user by dropping a stack of LISA proceedings onto the table and saying “My publications are bigger than yours.” The user deferred to superior credentials.

Publications are relatively cheap credentials to get. It takes time and work to write a good paper and submit it, and there’s an emotional cost to getting rejected, but that’s nothing to the effort involved in getting a degree, for instance. Furthermore, everybody benefits: you get the fame, your employer gets its name in print, and everybody who reads it gets information.

You don’t need to be able to write beautifully, and you don’t need to have completely brilliant ideas. You need to be able to express an idea with reasonable clarity, and be willing to work with an editor, and to take reasonable precautions like running a spelling checker. You do need to have an idea to express, but it doesn’t need to be earth-shaking; a good new idea or a good summary of other information is quite sufficient. For instance, if you write a program that you find useful, it’s probably possible to get at least a short paper out of it. If you find yourself explaining a topic frequently on USENET, you can probably get a paper out of it.

[Editor’s Note: Or at least a short article in :login:]
Internet Hypertext is Here

by Tony Sanders
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Have you wondered how to navigate the Internet to find specific data? Have you found yourself lost in a twisty maze of Gopher holes? The World-Wide Web may be just what you are looking for.

The World-Wide Web (aka Web, WWW and W3) is a wide-area, hypermedia information-retrieval project. Tim Berners-Lee began development on Web in March, 1989 to simplify access to the large body of documents generated at CERN. Web browsers provide a uniform interface for data available via a variety of Internet protocols (e.g., Gopher, WAIS, NNTP, FTP and HTTP).

The World-Wide Web is a wide-area, hypermedia information-retrieval project.

WWW services are now widely available on the Internet. Users can wind their way into ever-twister mazes of hypertext links where they can "warp" from geological data to Lewis Carroll's Through the Looking Glass before you can say "drink me."

Getting Started

To get started, you will need a machine with Internet access and a piece of software known as a Web browser. If a browser is available for your platform, it is worth the time spent installing it. If all else fails, you can probably use one of the following tty-based browsers:

- CERN Line-Mode
telnet info.cern.ch
  (no login required)
  This connects you to the public access line-mode browser at CERN (in Switzerland, be gentle with overseas links).

- Lynx
telnet ukanaix.cc.ukans.edu
  login: www
  This connects you to the public access Lynx browser at the University of Kansas. Lynx source is available via anonymous ftp from acs220.cc.ukans.edu in pub/lynx/.

- Emacs W3-mode
  WWW mode for emacs (works best with

Lemacs or Epoch) was written by William Perry <wmperry@indiana.edu>. Source is available via anonymous ftp to moose.cs.indiana.edu in pub/elisp/w3/.

The following World-WideWeb browsers are available for X11 platforms:

- NCSA Mosaic
  NCSA Mosaic is available via anonymous ftp from ftp.ncsa.uiuc.edu in Mosaic/mosaic-binaries. You can pick up binaries for Alpha, DEC, IBM, SGI, and Sun or get the NCSA Mosaic sources in Mosaic/mosaic-source. This version requires Motif.

- TkWWW (Tcl/Tk based)
  This version is available via anonymous ftp from export.lcs.mit.edu in /contrib/tkWWW-*. Requires Tcl/Tk. Includes a WYSIWYG editing mode.

- ViolaWWW
  ViolaWWW is available via anonymous ftp from info.cern.ch in /pub/www/src/viola920730.tar.Z. It's still in beta.

- MidasWWW
  MidasWWW is available via anonymous ftp from info.cern.ch in /pub/www/src/midaswww-1.0.tar.Z or from freehep.scri.fsu.edu in freehep/networking_news_email/midaswww/midaswww-1.0.tar.Z This version requires Motif and the UIL utilities.

Browsers for other platforms include:

- MACWeb (Macintosh)
  This is available via anonymous ftp from info.cern.ch in pub/www/bin/mac/MacWWW-WWWW_V1.02.hqx. Check out the file README_V1.02 for details. Requires Mac-TCP 1.1.1 or later.

- Cello (PC/Windows)
  This is available via anonymous ftp from fatty.law.cornell.edu in pub/LIl/Cello.. Currently requires the Distinct TCP/IP stack. They are working on a Winsock compliant version.

- NextWWW (NeXTStep 3.0)
  This is available via anonymous ftp from info.cern.ch in pub/www/bin/next. Includes a WYSIWYG editing mode.

† This is a re-print from login, the USENIX Association Newsletter, Volume 18 Number 5

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Browsing the Web

The heart of the WWW hypertext system is a document-reference scheme called URLs (Uniform Resource Locators). When you select a hypertext link, the browser automatically extracts the URL from the document. However, sometimes you will need to input the URLs by hand (for example, you need to input by hand the pointers to hypertext documents contained in this article.) For these occasions, browsers usually provide a "Goto" or "Open" dialog.

Here are some basic URLs to give you a feel for what they look like and how they work:

- ftp://info.cern.ch/pub/www/src
  This means use anonymous ftp to get /pub/www/src from info.cern.ch

- gopher://gopher.ora.com/
  This means use gopher to retrieve the root menu from gopher.ora.com.

  This means use HTTP on port 80 to get /non-local/gnat/www-primer.html from www.vuw.ac.nz.

See http://www.ncsa.uiuc.edu/demoweb/url-primer.html for more detailed information about URLs.

All you have to do now is run your Web browser software. When it first starts up, it will provide you with what is know as a Home Page. The Home Page is a hypertext document just like any other, the distinction being it's the first document you see. It will typically contain hypertext links to documents that outline global and local services that are available.

The World-Wide Web is growing to become a delivery platform for on-line books and journals.

Here are shortcuts to some interesting locations on the Web (the hypermedia features require NCSA Mosaic, other browsers will be supporting these features in the near future):

- Expo
  Hypermedia exhibits including "Vatican," "Soviet Archive," "1492: An Ongoing Voy-
  age," and "Dead Sea Scrolls"
  http://sunsite.unc.edu/expo/ticket_office.html

- Weather Maps/Reports
  Current weather map for the USA
  (You can select a location on the map and WWW will display a weather report for that area.)
  http://www.nmt.edu/8001/usa.html

- Honolulu Community College Campus Tour
  Multimedia tour of the Honolulu Community College campus
  (See the "HCC Campus Map and Directory" under "Maps and Directories" to help find your way around campus. The tour includes MPEG movies for some locations. There is also an exhibit on the Berlin Wall Freedom Monument and you can explore the Dinosaur Exhibit.)
  http://pulua.hcc.hawaii.edu/

The World-Wide Web is growing to become a delivery platform for on-line books and journals. O'Reilly & Associates just announced they will be delivering a product called Global Network Navigator (GNN) via the Web. GNN will consist of a regular news service, an on-line magazine, The Whole Internet Interactive Catalog, and a global marketplace containing information about products and services. For information about a free subscription send email to <info@gnn.com>.

For more information, the newsgroup comp.infosystems.www is available for general discussions. There is also a mailing list oriented towards development issues. To subscribe send email to <listserv@info.cern.ch> with the body "SUBS www-talk." The mailing list itself is <www-talk@info.cern.ch>. If you have a Web browser you can get more information from the following locations:

http://info.cern.ch/hypertext/WWW/TheProject.html
http://info.cern.ch/hypertext/WWW/Bibliography.html
An Update on UNIX-Related Standards Activities

by Nicholas M. Stoughton
USENIX Standards Report Editor
<nick@usenix.org>

IN MEMORIAM

On Thursday, the 15th of July, at 7:20 in the evening, the Language Independent Specification Requirement died peacefully, in its sleep. The LIS requirement left one child, the POSIX.1 Language Independent Specification, which has now filed to change its name. LIS will not be missed by any of the PASC members. No flowers should be sent, but contributions to the furtherance of non-LIS standards will be gratefully received.

Back To Work?

The LIS wars have raged for a year now, with the armies of the victorious righteous led principally by Stepeh Walli, Pete Meier and Paul Rabin. The entire UNIX community owes them a resounding “thank you” for having finally removed this onerous burden from our shoulders. Since Language Independent Specifications were originally mandated, attendance at POSIX meetings has fallen steadily, by thirty to forty percent, and progress has been at a snail’s pace. This lack of progress has wounded the Open Systems industry seriously. Homogeneous, nonstandardized, proprietary systems, such as Windows-NT (or Win-doesn’t, to use its new nickname), have had the perfect argument in their favor there are no standards to conform to.

The standards that are published, such as POSIX.1 (ISO 9945-1:1990), and POSIX.2 (now in print), have often been forced to leave out widely accepted industry practice for reasons of expediency. The work to add, for example, symbolic links to POSIX.1, or sockets to POSIX.12, has been in hand for some time, but so hampered by the LIS and Test Assertions requirements that they are still some way away from completion.

Freed from these shackles, working groups can now get down to the business of making new standards. They need help, encouragement, and support. For example, the X/Open Transport Interface work of the POSIX.12 group was funded by X/Open. The socket version of the same standard has had to progress on an entirely volunteer basis. If you care about sockets, help them!

All sorts of problems arise from slow progress. The POSIX.4a thread API shows a classic case of this; currently at Draft 8, the standard has been so long coming and so needed, that many people have implemented POSIX threads (or pthreads) from much earlier drafts (such as Draft 4). Things have changed dramatically in the interface from Draft 4 to 8, and when the final standard emerges (at Draft 9 or 10) those on earlier versions of the interface will be faced with major problems upgrading. In the meantime, people mistakenly believing they are buying standards-based products, are developing more and more applications on these old interfaces.

So let us get back to work, shake off the torpor, and try to make some visible progress over the next few months. It is also essential that attendance at POSIX meetings climb again. Falling numbers mean that costs rise and revenues fall. If we are not careful, POSIX will just be forced into chapter 11 bankruptcy, and that will be the end of standards as we know them! Some would think that this would be good. However, don’t forget the kind of standards that other bodies, who might well step in to fill the gap, produce: e.g., OSI, PCTE, and Standard BASIC.

User Requirements

Not all of you who read ;login: also get to read a newsletter published by the IEEE, called The Standards Bearer, which discusses the entire IEEE standardization effort. Andrew Salem, Staff Director of IEEE Standards and Secretary of the IEEE Standards Board has an interesting article in the April 1993 edition entitled “Standards Users Are We Listening To Them?”

I reproduce this article here, since, while not aimed at in particular, it is of direct relevance to the POSIX effort.

“Standards Users Are We Listening To Them?”

Standards activity is very expensive to industry, government, and the public interest groups that support it. It deserves a management system that is at least as good as that which we apply to our individual organizations.

In such a management system, the first step should be to determine the purpose of the

† This is a re-print from ;login, the USENIX Association Newsletter, Volume 18 Number 5
standard or the standards activity. This is where the user will be identified. There will most likely be a first, second, and possibly third level of user to identify. The primary user is that interest group that the standard or the standards activity is intended to serve. This is the most fundamental issue that a standards group must address, and once identified, every management decision that follows must relate back to assure that the standard does serve the user and user requirements. Such an approach would produce a standards activity quite different from some of those we see today.

It wouldn't be so hard to meet user requirements if we could all agree on who the real users are. John Rankine, IEEE Standards Board member, has pointed out that users exist at varying levels of interest, knowledge, and need. And within the system of standards, user interest, knowledge and need will vary significantly. But in all cases, the user is unique to the standard. Yet I don't know of any definition of user in the context of standards activity. And so we need to do two things. First, we must clearly define the user in the context of standards activity. Second, we need to establish a management system for standards activity that goes beyond the procedures.

In my opinion, user requirements are paramount for any standards activity; everything else is secondary. With this attitude, the cardinal principles of standardization balance, consensus and appeals must be considered and appropriately applied to achieve user requirements. As an example, the present American National Standards Institute (ANSI) process allows any single interest group to comprise 50% of the total membership of a balloting body. This right should be restricted to a user group. Further the general interest group can constitute more than 50% of the voting body. Yet the general interest group is the least affected group, having the least financial interest in the standard and the least public responsibility for the standard. Nevertheless, the process that we use today allows this group, in effect, to control the standard. These rules almost assure that user standards will not be met. The definition of balance has to be reconsidered who votes and at what level in the process must user requirements be considered?

In the context of meeting user requirements, what constitutes consensus? Is it a consensus of all interest groups or of the users? The word requirements implies something the user can't live without — a must. The present rules require that all interested parties have an opportunity to be participants. I agree with that. However, in practice, all interested parties vote, and that means that the users will be a minority in the process. There are some standards activities in which only the users vote on the final approval of a standard. Most of these activities involve public safety issues, and I believe it is a proper procedure in these cases. While consensus is sacred in the standards community, I think that in its present form it is overdone, misused, and serves as a weapon against achieving user requirements.

The appeals process is too loosely applied and is successfully used to delay the standards process. I am in favor of putting a framework around the process to clearly define how this process can be included in the context of achieving user requirements. After all, due process is not endless process.

"User requirements are paramount for any standards activity; everything else is secondary." My favorite forgotten user requirement is the production of standards in a timely fashion. Much of the recent debate on Language Independence and Test Assertions has been forced because we needed to break the log-jam and try to get some standards back on the road toward production.

Consensus by exhaustion, now a popular phrase at POSIX meetings, is not to be encouraged!

As Andrew Salem concludes, due process should not be endless process.

Report on ISO Working Group

John Hill <jhill@corp.bb.unisys.com> reports on the May meeting in Heidelberg, Germany:

On May 10–14, 1993 SC22/WG15, POSIX and its rapporteur groups met in Heidelberg, Germany. This article reports the key outcomes of that meeting. Note that the meeting approved several resolutions and assigned several action items. At the end of this report I have reproduced the text of those resolutions thought most important. The action items are not included as they're too boring.

1. From "Standards Users Are We Listening to Them?", by Andrew Salem, reprinted with permission from the IEEE Standards Bearer, Vol. 7 No. 2, April 1993.
Readers should note that I acted as the head of the US delegation. As a result, this report shows a bias in favor of US participation and participants. This is not to denigrate the important contributions made by non-US participants in any way. I focus on the US perspective because that is how I see things. To quote the memorable former Houston Oilers football coach, Bum Philips, "You got to dance with them what brung you."

Attendance

The first thing to understand about this meeting is who, or really which countries, participated. The usual suspects were rounded up. There were delegations from seven countries. The numbers represent the corresponding number of delegates. Participants came from: Canada (3), France (1), Netherlands (2), Germany (1), Japan (2), UK (3), US (5, plus 4 other attendees, for various reasons).

Major Decisions Based on Contributed Documents

At the risk of pointing out the obvious, I note that the fundamental way by which business is conducted at international standards meetings is by formal document. If a country wants to accomplish something, the best means is to contribute a document stating their goal. If necessary, supporting documentation can additionally be contributed.

As has been its practice, the US contributed the most to the meeting, as measured by the number of formal documents submitted. The following are the most notable US contributions together with the corresponding meeting outcomes.

a. IEEE/CS/PASC status report (WG15 SD-11)
This states the current development status for all the PASC projects. The contribution tells JTC1/SC22/WG15 what they can expect, when it should arrive, and how large it will be.

b. Presentation of language independent specifications (WG15 N383)
This contribution identifies the situation the US is facing given its obligation to deliver language-independent specifications (LISs) for POSIX APIs. Outcome: The US initiated a discussion of the current situation about LIS. A presentation focused on both the US options for developing LISs, and requirements assumed to be fulfilled by LISs. WG15 provided guidance to PASC.

c. Development synchronization plan (WG15 N352R)
This contribution identifies how the US proposes JTC1/SC22/WG15 develop and approve interpretations to reflect recently approved JTC1/SC22 procedures for interpretations. Outcome: WG15 adopted the US-sponsored plan.

d. Recommendations on management of rapporteur groups (WG15 N356)
This contribution recommends JTC1/SC22/WG15 closely manage the work of its rapporteur groups. Outcome: WG15 adopted the US proposal to closely manage its rapporteur groups.

Other WG15 Decisions

Some of the decisions reached by WG15 were not based on contributed documents. The most important of those were:

1. Lead Rapporteur for Conformance Testing:
WG15 named Gerry Powell, succeeding Roger Martin.

2. Ada Binding: Following continued resistance from France, WG15 decided not to register IEEE Std 1003.5 (Ada Binding) as a Committee Document (CD). The US advised WG15 of its likely intent to submit the standard for fast track approval.

3. Real Time Extensions: WG15 requested the US to submit the latest draft of P1003.4 for registration as a Draft Amendment (DAM) to 9945.

4. FORTRAN 77 Binding: The US initiated a discussion of the possible submission of IEEE Std 1003.9 for fast track approval as a technical report. WG15 supports this and instructed the convener to report it to SC22.

5. Test methods: WG15 approved a disposition of comments on CD 13210, test methods for 9945.

6. Model for Conformance Testing: The UK provided an early draft of a potential New Project (NP) to develop a generalized model for conformance testing. WG15 decided to distribute the draft for comments.

7. National Profiles: Japan and the internationalization rapporteur group provided a draft NP to develop a technical report for guidelines to developers of national profiles. Discussion will take place at the next WG15 meeting.

8. NP for LIS Guidelines: WG15 decided to not pursue developing a standard for these guidelines. Instead, it encourages WG11 to develop them.

In summary, this was a successful meeting due mainly to the effectiveness of each of the delegates (not just those from the US but from all the other countries, too.) The next meeting is to be hosted by the United States. It will be held 25-29 October 25-29, 1993 in Annapolis, Maryland, immediately following the October PASC meeting.

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Resolutions

RESOLUTION 93-233
Requirements on Specification Methods

SC22/WG15 reaffirms the following requirements relating to the choice of specification methods for projects JTC1.22.21, JTC1.22.39, and JTC1.22.42:

1. To provide a clear and authoritative functional specification for POSIX services, and
2. To provide coordination and consistency between multiple language bindings to the same services, and reaffirms the following related objectives:
3. To support easier and faster development of language bindings,
4. To support the development of language bindings that are appropriate for each programming language,
5. To support the development of language bindings by independent Standard Development Organizations, and
6. To support the development of POSIX standards in a timely and efficient manner.

RESOLUTION 93-234 PASC Information

Whereas SC22/WG15 has a requirement to develop both language Independent Specifications (LIS) and Language Dependent Specifications (LDS), and
Whereas SC22/WG15 recognizes that, due to resource constraints, the current approach to the development of PASC LIS standards is having a severe negative impact on the ability of the US member body to develop and forward LDS standards in a timely manner, and that this has an equal effect on the work of SC22/WG15, and
Whereas SC22/WG15 notes that the current US development group may discontinue the current requirement for the parallel development of LIS and LDS, for the reasons given above, and
Whereas SC22/WG15 recognizes that the current work in the area of LIS is not yet mature, and is the subject of work in other groups, such as WG11, and
Whereas SC22/WG15 recognizes that the requirement that LIS was intended to satisfy may be met in other ways, and
Whereas SC22/WG15 wishes to ensure that both LIS and LDS are brought forward into the international arena as timely a manner as possible,

Therefore SC22/WG15 resolves: To investigate the most appropriate means of satisfying the requirements and objectives contained in Resolution 93-233, for which the current LIS methods were originally formulated, taking account of the work of other groups, such as WG11.

1. That it will accept LDS documents for progression to DIS, without an accompanying LIS, on an individual basis where Member Bodies support the action, until such time as it determines the precise form in which the requirements and objectives, for which LIS was originally formulated, are to be met.
2. To request the US to preserve and progress in a timely manner the LIS work that is currently underway, taking fully into account the requirements and objectives set out in SC22/WG15 Resolution 93-233, and to ensure that US standards developed for progression within SC22/WG15 satisfy those requirements and objectives.

RESOLUTION 93-235 Disposition of IEEE 1003.9

Whereas there exists a completed IEEE FORTRAN 77 binding to 9945-1:1990 (P1003.9),

Therefore SC22/WG15 invites the US to forward the IEEE 1003.9 document to JTC1 with the recommendation that it be fast-tracked as a Technical Report Type 2.

RESOLUTION 93-243 Appreciation of Mr. Rabin

SC22/WG15 thanks Mr. Paul Rabin for the presentation he gave on the status of the LIS activities within the IEEE PASC and the various options available to continue this work.

RESOLUTION 93-244 NP for LIS Guidelines

Whereas the general question on Language Independence is clearly the focus of SC22/WG11, and
Whereas WG11 has drafted an NP for a Type 3 Technical Report on Guidelines for the Preparation of Language Independent Service Specifications;

Therefore WG15 encourages WG11 to proceed with the NP for a Type 3 Technical Report on Guidelines for the Preparation of Language Independent Service Specifications, taking into account the requirements and objectives for specification methods listed in Resolution 93-233.

(This Resolution supersedes WG15 Resolution 92-197.)

Report on POSIX.O: Guide to OSE

Kevin Lewis <klewis@gucci.ent.dec.com> reports on the July 16-20, 1993 in Denver, CO:

For the first time in a long while (in fact possibly since the first meeting in March 1988), we had a very loose meeting schedule, essentially because the document is in the hands of our production editor, Hal Jespersen, who is producing the next
draft of the guide. This is to be an interim draft, which will be numbered 15A, and will serve strictly as an accountability draft. The section leaders will use this interim draft to ensure that all of the changes they submitted as a result of ballot resolution have been made. Once this is turned around, Hal will produce draft 16, which will be sent to the IEEE for recirculation and forwarded to SC22 through WG15 for Committee Document (CD) registration. The goal is to commence the recirculation by late August.

The group met with POSIX.22, formerly known as the Distributed Security Study Group, to discuss how its work should relate to the work of POSIX.0 and to discuss the possible future integration in the guide. What is meant by “integration” is yet to be defined. We may actually decide to insert the final product into a future revision of the POSIX.0 Guide or simply point to it. One key concern that arose out of the joint session is the apparent decomposition of the application platform as proposed by POSIX.22 in order to expose other API’s for security purposes. This conflicts with the model developed by POSIX.22. Given that the last comment on this issue from a Double Deuce member was preceded by his pounding his fist on the table, it became apparent that no consensus was going to be reached. The groups agreed to meet again jointly during the October 1993 meeting, in Bethesda.

The group held another joint meeting with POSIX.18, which is developing the Interactive System Application Environment Profile (AEP). This work is quite important to POSIX.0 because it serves as a real live profile that can be submitted to ISO as an ISP. It can also serve as a model for future profiling work and makes the concept of profiles a real one. The chair of POSIX.18 started by informing us that the profile would be held in limbo until other base standards work that served as normative references within the profile was completed. We argued (in an encouraging tone, of course) that these standards should be placed in an annex in order to allow this work to go to ballot. Later in the week, the POSIX.18 working group agreed to take this approach.

The remainder of the week was spent discussing the issue of future of our own work. This started in our normal “organized chaos” manner. Being creative during a period when we’ve had to be quite ballot-focused was a challenge. The result of the discussion yielded three areas that appear at present to be the priority for future work:

- distributed processing,
- system and fault management, and
- user profiles.

Individuals with interests in each of these areas agreed to write up draft Project Authorization Requests (PARs) for each topic with the objective of discussing them during the October meeting. These PARs are for discussion only and not for submission to the PASC SEC just yet. The group also agreed to invite some folks from outside the effort to come in and give us some ideas on what we should be considering for future work. These will be from the OSE Implementors Workshop (OIW) and SC21.

As the meeting concluded, the co-chair reminded the group not to forget that we still had the goal of getting over the hump of our first recirculation to which a note of consensus was reached with a collective sigh.

Report on POSIX.7: Systems Management

Matt Wicks <wicks@fnal.gov> reports on the July 12-16, 1993 meeting in Denver, CO:

[Editor’s note: Two reports on the work of the POSIX.7 system management activities are presented this time. With the formation of a new project to address User Administration, it is useful to have a special report on this new activity.]

Introduction

Two of the three POSIX.7 System Administration small groups met during the week:

- POSIX.7.2 – Software Installation and Management
- POSIX.7.3 – User and Group Administration

The week also contained three plenary sessions that also included representation from the POSIX.7.1 Printing Administration working group.

Plenary Sessions

The one significant issue discussed at the plenary sessions was how much coordination and commonality is desired and should be required between the various POSIX.7 standards? This is an issue that has been wrestled with for nearly two years (in fact from about the time it was agreed to form small groups, each with its own
Project Authorization Request (PAR) and document to produce. Now that one document has actually entered formal ballot, and another document is a couple of meetings away from entering ballot, these issues need a resolution.

One possible solution to this problem is to have a POSIX.7 document that is common to all POSIX.7 standards. This could include items such as common utility options, common non-normative sections such as task descriptions, common object model, etc. No resolution was reached on the above topic, but Martin Kirk, Chair of POSIX.7 has taken an action item to determine how all of POSIX.7 will fit together as well as addressing issues with respect to the formation of the ISO document that covers POSIX system administration, ISO 9945-3.

Independent of the above problems, POSIX.7 decided it was important to agree upon a standard syntax for options that will be common to utilities from all of the small groups. This specifically addressed the use of -x/-X.

Note the following description of these option letters indicates my bias as an active member of the POSIX.7.2 small group! The -x option is used to pass in extended options or attributes. This option letter is required because there are large number of possible options/attributes that could potentially be required of system administration utilities. It is impractical, if not impossible, to create a different option letter for each possible item.

An example of -x for printing would be something like

-x "-media-used iso-a4-white"

whereas for software, a typical use is

-x enforce_dependencies=true

The -X option is used to specify a file that contains on each line individual options/attributes that could have been specified using multiple -x options.

The end result of all of this, is that after several meetings of discussion on these two options, a common syntax was developed for all POSIX.7 small groups. It will require each small group to make some modifications.

Print Administration

This small group did not meet because they were in the process of going through formal ballot. Formal ballot was scheduled to end on July 29. The balloting group consists of 72 people. About half of the members are from IBM, HP, DEC, USL, and Sun.

This is the first system administration standard to go to ballot, so many people (well at least myself) are quite interested to see how it proceeds. There has been much discussion over the past several years of the appropriateness of the POSIX.7 work. The reaction to this ballot should shed some light on this issue.

Software Installation and Management

The Software small group recently conducted a mock ballot and is working towards their goal on entering formal ballot towards the end of Q94. The purpose of this meeting was to try to finalize any major technical issues for incorporation into the next version (Draft 10). In addition, the entire document was reviewed for lesser technical issues as well as both major and minor editorial issues.

The first major issue discussed was whether or not the standard should include an Application Programming Interface (API) as well as a command line interface (CLI) for certain functions. The decision was made not to include an API, although it would be desirable to formulate an API for a future amendment to POSIX.7.2.

The second issue was a discussion on whether the standard should address error recovery and software installation rollback. The lack of such functionality was a source of a variety of objections from the mock ballot. After significant work, it was agreed to specify basic functionality in this area and a specification was worked out consistent with existing practice from some of the vendors in the group.

The next major issue was the discussion of the inclusion of managed objects in the POSIX.7.2 standard. Managed objects are a creation from some of the networking management standards organizations and are consistent with an object oriented programming paradigm. Proponents indicate that including them in the standard will promote interoperability. I have long been against including them in the standard, as I feel we should concentrate on more practical issues of specifying a CLI and/or API. My viewpoint prevailed at the meeting, at which it was agreed that we will not specify formal managed objects.

The last major issue was the discussion of including functionality in the standard to support patching and updating software, another item pointed out in the mock ballot. The decision was made that the standard currently allows for these features and no specific additional functionality is required.
A major landmark was reached for the User group in that their Project Authorization Request (PAR) was approved by the Sponsor Executive Committee (SEC). This allows them to begin work on their standard, and we hope it will encourage organizations to send people to participate in this group. A lack of interested people has been a major obstacle for this group.

The small group spent most of the meeting working on getting their document into official format and reviewing the existing object definitions and task descriptions. A major purpose of this review was to identify terms that need to be included in the definitions section.

The User group indicated that they have decided not to address the `su` or `login` commands, but hope to get POSIX.2 (Shell and Utilities) or POSIX.6 (Security) groups to address these commands. There is little hope that these groups will actually undertake this work. Another possibility is to submit another PAR to address these commands as an amendment to the POSIX.2 standard and ask that the work be assigned to POSIX.7. Personally, I think this would be a good idea, and would meet the idea of standardizing existing practice better than any other work currently in POSIX.7.

Report on POSIX.7.3: User Group Administration

Bernard Kinsler <kinsler@rsul.unisys.com> reports on the July 12–16, 1993 meeting in Denver, CO:

[Disclaimer: This is a personal view of SysAdmin and has not been written in consultation with the other members of POSIX.7.]

Some Background & History

Some time ago, the Systems Administration group decided that it was neither feasible, nor desirable to try and produce a monolithic SysAdmin standard. It would weigh about 300 pounds, be balloted in about 2093 and not be approved. The area is just too broad to be covered in one standard and too broad to achieve any kind of consensus.

So it was decided to form small groups to look at particular aspects of SysAdmin. Each group could pick an area that needed standardization (because of industry demand), that could be standardized (because of sufficient existing practice), and that could be done in a realistic time scale (because of a narrow scope). The timescale is important because ISO insists on it.
Some examples:

- Managing mail
- Quota administration
- Monitoring and auditing users
- Accounting (as in billing for resources used)
- Software license usage

Early on, we did get carried away in some of the things that we thought were possible, and we could rightly have been accused of invention. This freewheeling was exacerbated by the lack of good reference documents that would have given a focus to the group. We had to cover distributed user management, in which existing practice seemed to be sadly lacking.

What has changed?

Nearly everything! In the last two meetings, we have concentrated on two reference documents:

- **Santa Cruz Operation’s User Management**
  Provides a CLI (Command Line Interface) for the management of system defaults, user templates, and extended security

- **USL SVID3**
  Provides a CLI for the management of the user database, home directories and the group database (This interface is in wide use and incorporates a large body of existing practice.)

Using these documents, we have been able to define our efforts narrowly and base them solidly on existing practice. We can formalize this to cover a distributed heterogeneous environment. With the help of the security group, we can cover the extended security requirements. As reassurance of our new narrow scope, none of the items listed above are included in User/Group Management.

Having defined what we want to do and armed with good reference documents, we rewrote the Project Authorization Request (PAR) at this last meeting. Having an approved PAR is a prerequisite to producing a ballotable standard.

The stated scope and purpose of the new group is this:

User administration includes, but is not limited to, tasks such as the creation and maintenance of user accounts and groups in both single systems and heterogeneous distributed environments. POSIX.7 is committed in this standard to provide the distributed management for a POSIX.1 and POSIX.2 conformant system.

Although POSIX.1 describes a user database, a group database, and the concept of a user’s home directory, utilities to manage these entities are not described by any current standard. The User Administration working group takes as its mission the management of these entities, as described in POSIX.1 and POSIX.2, as well as the management of optional extensions such as an account password.

**Current State of User/Group Management**

There is an initial draft, which we spent all of the last meeting putting into the official format and in refining existing text. The following commands are defined,

- `useradd` to `groupadd` to Add a user/group
- `userdel` to `groupdel` to Remove a user/group
- `usermod` to `groupmod` to Modify a user/group
- `users` to `groups` to List a user/group
- `passwd` to Change user/group password

Managed objects are defined using GDMO (Guidelines for the Definition of Managed Objects, ISO 10165-4). The intention here is to use GDMO as a convenient way to give a formal definition of the objects and attributes, but there is no intention to require an object oriented implementation. To aid readability, we have omitted all those parts of GDMO which are only needed for implementation. This includes NAME BINDINGS, REGISTERED AS, and so on. We have simplified the BEHAVIOUR syntax, again for readability. Don’t try and compile these definitions! Equally, do not be put off by GDMO. These definitions should be quite readable even if you have never seen GDMO.

There are only four managed-object classes defined, which are organized as a collection of PACKAGES. This is a convenient way to separate mandatory and optional attributes. All mandatory attributes for a class are grouped together in a package. Optional attributes are grouped in a logical manner, for example, all the basic password attributes for the user class are in one package. An added advantage is in helping to define the optional extras. If an optional package is implemented, all of it must be implemented.

**Support Needed**

The User/Group Management group is actively seeking support. If you would like to join this group by attending meetings, you are welcome.
 chance to influence the standard.

If you can not attend, but feel that standardization of this topic is worthwhile, then a letter of support from your company would be helpful. The next meeting will be at the Bethesda Marriott Hotel, in Bethesda Maryland, October 18 – 22, 1993. For more meeting details, contact:

Standards and Technical Activities Assistant IEEE Computer Society
1730 Massachusetts Ave. NW
Washington, DC 20036-1903
+1 (202)371-0101
FAX (202) 728-9614

If you would like any more information on how to attend (or on anything else related to POSIX.7. I am the Secretary), contact me. I would prefer email.

Report on Automated Testing BOF

Kathy Liburdy <liburdy@hubcap.clemson.edu>
reports on the July 12–16, 1993 in Denver, CO: The Automated Testing (AT) BOF was created as a forum for the discussion of alternative and progressive approaches to conformance testing. While many members of POSIX are interested in testing issues, they may not be able to (or want to) devote the majority of their efforts to testing. By providing brief reports on current research in conformance testing, concise updates on related standards groups, and demonstrations of testing systems, the AT BOF extends the opportunity to all members to participate in this important aspect of the standards development process.

The AT BOF meets quarterly during meetings. To facilitate communication between meetings, a newsletter, called OATS, and a mailing list have been created for the group. There are three issues to date of the newsletter Automated Testing in Open Systems. Articles describing existing testing efforts as well as commentaries on testing related issues are welcome for future issues. Submissions, as well as requests for copies of existing issues, may be sent to <liburdy@hubcap.clemson.edu>. The mailing list oats can be joined by sending a message to <oats-request@stdsbbs.ieee.org>. The first AT BOF was held in New Orleans, January 1993. Clemson University demonstrated their automated testing system (CATS), which was funded by the U.S. Navy. CATS is an interactive system that has proven useful in the design of interfaces as well as the testing of implementations for conformance. A single user version of the CATS facility is available as a demonstration copy by anonymous ftp from the site ftp.eng.clemson.edu in the directory pub/cats.

Shane McCarron introduced the Assertion Definition Language (ADL) Project sponsored by the Japanese Ministry of International Trade and Industry. This project is an effort to develop technology that will automate the process of test suite development, provide improvements in the availability of test suites for Open System standards, and improve the overall quality of these standards.

The second AT BOF was held at the April POSIX meeting in Irvine. DEC gave a presentation and demonstration of their testing technology, which is based on extended finite state machines (EFSMs). As part of an advanced development project at DEC, the concepts of EFSMs have been applied to a variety of test problems and can achieve both exhaustive and thorough testing through automatic test generation. Jim Leathrum of Clemson University introduced a formal, yet English-based language for writing test assertions in the CATS environment. This assertion language was designed to have intuitive, yet precise, semantics with a natural syntax. Examples of assertions developed in this assertion language were presented.

The group then discussed the potential impact of the recent decision to rescind the requirement that all standards be accompanied by POSIX.3 style test assertions prior to passing ballot. There was a general consensus that there are many challenging issues that remain to be addressed in the area of conformance testing and that the AT BOF may serve as an arena to explore potential solutions to existing and emerging problems.

At the Denver POSIX meeting in July, presentations were given by Lowell Johnson, Shane McCarron, and Rob Savoye. Lowell Johnson presented the status of the P2003 working group. The P2003 working group continued working on Draft 0.2, updating sections on profile testing, LIS, and general assertion writing. The group also determined that the scope of P2003 would be to target the standard for PASC, but write it using general terminology and be applicable for specifications from ISO to a private company’s specification. Shane McCarron gave an update on the Chimera project and presented results of initial research into existing technologies for automated testing. Shane reported that the Chimera project had found a base technology at Sun Microsystems that was mature and changeable. During the next nine months, Sun will take the base research, which uses C++, and modify it to meet the remaining requirements. The research is expected
to be completed by March 1994. A proof of concept is planned using the existing C++ technology to describe tests against 1003.1 and 1003.2. A complete test suite is planned for development in early 1994.

Rob Savoye presented developments made by Cygnus in the field of automated software test generation. DejaGnu is a framework used to set up automatic testing, particularly regression testing. Test suites built by DejaGnu are available at no cost via direct ftp. Cygnus is currently developing a 1003.1 test suite. A general description of DejaGnu and the DejaGnu 1.0 Release information was recently posted to the oats mailing list.

The meeting concluded with a discussion of future directions for the AT BOF. The Steering Committee on Conformance Testing (SCCT) had expressed an interest in investigating alternative testing methods in a forum similar to that of the AT BOF. The issue of whether or not the AT BOF should formally become part of the SCCT was raised. Participants expressed their desire to continue the AT BOF but not officially link it to any standard working group.

The next meeting of the AT BOF is scheduled for October 1993. The date and time will be posted to the oats mailing list. The current agenda includes an update on the ADL Project by Shane McCarron and a presentation of the CATS approach to testing profiles by Kathy Liburdy. Suggestions for additional agenda items are welcome and may be posted to the oats mailing list.
I cope with my email using MH, the Rand Message Handling system. MH is freeware, and I reckon it's God's own mailer, because if you get as much mail as God, you need an industrial-strength mailer.

One of the things I like about MH is that it stores each message as a separate file; mail folders are directories. So the third message in folder File-AUUG is most likely called Mail/File-AUUG/3 (relative to my home directory). MH's commands are separate shell commands, such as inc to incorporate new mail, repl to reply, and comp to compose a message.

This means I can use all the facilities of Unix and the shell to manipulate my email.† Not only can I, for example, rewrite inc to automatically sort my incoming mail into several different mailboxes depending on sender and subject, but I can extend the power of my mail environment by adding new commands, like the following shell script, which I call formletnum:

```bash
#!/bin/sh
if [ $# != 1 ]; then
    echo "USAGE: $0 formletter-number"
    exit 1
fi
exec comp -form File-Formletters/$1
#
# end
```

So

```
formletnum 3
```

composes a letter using message 3 in folder File-Formletters as a template.

I can also choose my template by subject, using the following script, which I call formlet:

```bash
#!/bin/sh
if [ $# -lt 1 ]; then
    echo "USAGE: $0 subject"
    exit 1
fi
exec comp -form File-Formletters/\'pick +File-Formletters \-subject "$*" | head -1'
```

If I say, for example

```
formlet new account
```

this uses MH's pick command, piped to head(1), to find the message number of the first message in folder File-Formletters with "new account" in its subject line. The message number is then passed to MH's comp command, as in the previous script.

I also have one form letter template that is not in any folder. It is in the top level of my Mail directory, and the following C-shell alias lets me compose a message using it:

```
alias poem comp -form poemtemplate
```

So when I feel like sending a newly-written poem to my friends in a certain international on-line poetry workshop, all I have to do is say poem, type in the lines, and MH and csh, working with several other Unix tools, take care of the rest.

By the way, I'm supposed to be the editor of this column. I'll gratefully accept your contributions, which will be replied to (not automatically!) and duly filed in the appropriate MH folder until next AUUGN-time.

"Janet Jackson <jackson@cwr.uwa.edu.au>"

† When I'm using X, I also use xmh, a wrapper that calls the MH commands, to graphically manage my labyrinth of mail folders. I also know of two visual interfaces to MH that run on ordinary terminals: vmh, a vi-like interface, and plum, Tom Christiansen's interface written in perl.
1. AUUG93

86 individual and 12 institutional new members were directly attributed to the conference. The majority of these were a direct result of the membership form in the registration brochure.

Overall the conference & exhibition appears to have a profit of between $50K & $60K. Numbers to be confirmed.

LH recommended we promote tutorials separately as they are a large portion of income factor. GH suggested a tutorial road show outside of the summer conference series.

AUUG '93 PR was extremely good. Media showed interest and was keen to meet the speakers. Both the build up and follow up was good. Stoll provided good mechanism to gain interest. Strength of programme was exciting and offered good level of corporate participation.

PL (AUUG93 program chair) gave an overview of suggestions for '94. He will pass on directly to the '94 committee. He covered: Beverages at breaks, cross-over time shortened with additional time going to lunch and breaks to be longer. Hire staff for terminal room, booth. Managing things better, i.e. dedicated to task and managing it. Tweak dinner and continue with the change, also need to change expectations.

AUUG95 and forward venues were discussed including Brisbane as an option for 1995 or 1996.

2. President's Report

A new organisation, TAOSS, has been formed with an oversight board for open systems activities. AUUG should be involved. PM to discuss with PW.

3. Treasurer's Report

FC reported that we had a minor difficulty with cash flow. However, the bulk of expenses are over from the conference. We are expecting $16k from connect.com for AARNet connection fees. FC suggested we could use a dedicated resource to handle connection and network items. Current status is: $67k in cash management, $30k and $34k in other accounts. PM thanked FC for his excellent job with the conference.

4. Australian Articles

Articles for Australian - general requests were sent out to chapters and AUUG exec. It was suggested to put an ad in AUUGN requesting papers. EF to contact Brad Jelfs and request an article from him. MP suggested direct contact with the chapters would help and asked the executives to contact their chapters.
5. Summer Conferences

Summer Conference Series - Final dates:

Feb. 2-5; Melbourne; 10-11; Darwin; 14-16; Canberra; 21-22; Perth; 28-1; Adelaide Mar.; 3

Kirk McKusick will be doing a roadshow tutorial with all of the summer conferences.

6. New Committee Member

Chris Schoettle has indicated he cannot continue on the committee due to unforeseen work commitments. A new committee member needs to be co-opted.

7. Other Business

The UniForum NZ conference is in May. EF will check on group rate to attend. EF to check on all Pacific-rim conferences and post.

EF to do advertisement for AUUGN of promotionals and documents left. T-shirts will sell @ $10.00 each, Proceedings $50.00, '92 Proceedings sell for $25.00@ overseas, postage will be charged. In addition, one copy of all will be sent to Adrian Booth as AUUG historian.

Cheque signing - it was moved, seconded, and passed to raise the limit required for dual signatures to $1k. Signatories will be: GH, PM, FC, CM.

AUUG collateral - update of handbook and supplemental directory will be done.

Membership Drive - EF to do research on costing for direct mail campaign to MIS 2000 list etc. and provide budget. Implement in February time frame to work with summer conference series.

3 Year Business Plan - PM stated was logical and overall had no problems with it. Should be doing all that was mentioned. Time was running out, so asked committed to review it via e-mail.

8. Next Meetings

The next meeting will be on Fri 10th December 1993 at Softway.

Peter Wishart
AUUG Inc - Secretary
AUUG Membership Categories

Once again a reminder for all "members" of AUUG to check that you are, in fact, a member, and that you still will be for the next two months.

There are 4 membership types, plus a newsletter subscription, any of which might be just right for you.

The membership categories are:
- Institutional Member
- Ordinary Member
- Student Member
- Honorary Life Member

Institutional memberships are primarily intended for university departments, companies, etc. This is a voting membership (one vote), which receives two copies of the newsletter. Institutional members can also delegate 2 representatives to attend AUUG meetings at members rates. AUUG is also keeping track of the licence status of institutional members. If, at some future date, we are able to offer a software tape distribution service, this would be available only to institutional members, whose relevant licences can be verified.

If your institution is not an institutional member, isn’t it about time it became one?

Ordinary memberships are for individuals. This is also a voting membership (one vote), which receives a single copy of the newsletter. A primary difference from Institutional Membership is that the benefits of Ordinary Membership apply to the named member only. That is, only the member can obtain discounts an attendance at AUUG meetings, etc. Sending a representative isn’t permitted.

Are you an AUUG member?

Student Memberships are for full time students at recognised academic institutions. This is a non voting membership which receives a single copy of the newsletter. Otherwise the benefits are as for Ordinary Members.

Honorary Life Membership is not a membership you can apply for, you must be elected to it. What’s more, you must have been a member for at least 5 years before being elected.

It’s also possible to subscribe to the newsletter without being an AUUG member. This saves you nothing financially, that is, the subscription price is greater than the membership dues. However, it might be appropriate for libraries, etc, which simply want copies of AUUGN to help fill their shelves, and have no actual interest in the contents, or the association.

Subscriptions are also available to members who have a need for more copies of AUUGN than their membership provides.

To find out your membership type, examine your membership card or the mailing label of this AUUGN. Both of these contain information about your current membership status. The first letter is your membership type code, M for regular members, S for students, and I for institutions, or R for newsletter subscription. Membership falls due in January or July, as appropriate. You will be invoiced prior to the expiry of your membership.

Check that your membership isn’t about to expire and always keep your address up-to-date. Ask your colleagues if they received this issue of AUUGN, tell them that if not, it probably means that their membership has lapsed, or perhaps, they were never a member at all! Feel free to copy the membership forms, give one to everyone that you know.

If you want to join AUUG, or renew your membership, you will find forms in this issue of AUUGN. Send the appropriate form (with remittance) to the address indicated on it, and your membership will (re-)commence.

As a service to members, AUUG has arranged to accept payments via credit card. You can use your Bankcard (within Australia only), or your Visa or Mastercard by simply completing the authorisation on the application form.
To apply for AUUG membership, complete this form and return it with payment in Australian Dollars to:

REPLY PAID 66, AUUG MEMBERSHIP SECRETARY,
P.O. BOX 366, KENSINGTON, NSW 2033, AUSTRALIA
Tel: +61 2 361-5994  Fax: +61 2 332-4066

NOTE: Please do not send purchase orders - perhaps your purchasing department will consider this form to be an invoice. Foreign applicants please send a bank draft drawn on an Australian bank, and remember to select either surface or air mail.

Individual or Student Membership:
I, ___________________________ hereby apply for:

- Renewal/New membership of AUUG $ 90.00
- Renewal/New Student membership $ 25.00 (please complete certification portion)
- International surface mail $ 20.00
- International air mail $ 60.00
- UniForum affiliate membership $ 20.00

Total Remitted: AU$ ________ (Cheque, or money order or credit card)

Local Chapter Designate:
You can participate in the activities of a local AUUG Chapter. Part of your fee will be given to the chapter to support those activities. By default a regional chapter will be selected for you. If you would rather nominate a chapter, please specify here (indicate NONE for no chapter).

To Better Serve You, Please Print Your Contact Information:

Name/Contact:

Position/Title:

Company:

Address: ____________________________________________ Postcode

Tel: BH AH

Fax: BH AH

Email address: ____________________________________________

Over for Institutional Membership

Student Member Certification: (to be completed by a member of the academic staff)
I, ___________________________ certify that ___________________________ is a full time student at ___________________________ and is expected to graduate approximately ___________________________.

Signature ____________________________________________

To AUUG Secretariat Use

Chq: bank a/c

bbs #

Date: ____________ $ ____________

Initial: ___________________________

Date processed: ___________________________

Membership #: ___________________________

AUUG Inc. as a user group, exists to provide UNIX® and open systems users with relevant and practical information, services, and education through cooperation among users.
To apply for AUUG membership, complete this form and return it with payment in Australian Dollars to:

REPLY PAID 66, AUUG MEMBERSHIP SECRETARY,
P.O. BOX 366, KENSINGTON, NSW 2033, AUSTRALIA
Tel: +61 2 361-5994 Fax: +61 2 332-4066

NOTE: Please do not send purchase orders - perhaps your purchasing department will consider this form to be an invoice. Foreign applicants please send a bank draft drawn on an Australian bank, and remember to select either surface or air mail.

We, ____________________________ (Company Name)
do hereby apply for:

Renewal/New Inst. membership of AUUG
International surface mail
International air mail

TOTAL REMITTED
AUD$ ____________________________

(Cheque, money order, or credit card)

We agree that this membership will be subject to the rules and by-laws of AUUG as in force from time to time, and that this membership will run from time of payment/renewal until the end of the calendar or financial year.

We understand that we will receive two copies of the AUUG newsletter, and may send two representatives to AUUG sponsored events at member rates, though we will have only one vote in AUUG elections, and other ballots as required.

Signed ____________________________ Date ____________________________
Title ____________________________

INSTITUTIONAL MEMBER DETAILS:
To be completed by institutional members only.

Following are our specified contacts. The primary contact holds the full member voting rights. The two designated reps will also be given membership rates to AUUG activities including chapter activities. By default a regional chapter will be selected for you. If you would rather nominate a chapter, please specify in space provided (indicate NONE for no chapter). (Please print clearly or type)

Primary Contact
Position/Title ____________________________
Address ____________________________ Postcode ____________________________
Bus. Tel: ____________________________ Bus. Fax: ____________________________
e-mail address ____________________________
Local Chapter Pref. ____________________________

1st Rep. ____________________________
Position/Title ____________________________
Address ____________________________
Bus. Tel: ____________________________ Bus. Fax: ____________________________
e-mail Address ____________________________
Local Chapter Pref. ____________________________

2nd Rep. ____________________________
Position/Title ____________________________
Address ____________________________
Bus. Tel: ____________________________ Bus. Fax: ____________________________
e-mail address ____________________________
Local Chapter Pref. ____________________________

Please charge $ ____________________________ to my
[ ] Bankcard, [ ] Visa, [ ] Mastercard
Account number: ____________________________
Expiry date: ____________________________
Name on card: ____________________________
Signature: ____________________________

AUUG Inc. as a user group, exists to provide UNIX® and open systems users with relevant and practical information, services, and education through cooperation among users.
AUUG Incorporated
Application for Newsletter Subscription
AUUG Inc.

Non members who wish to apply for a subscription to the Australian UNIX systems User Group Newsletter, or members who desire additional subscriptions, should complete this form and return it to:

AUUG Membership Secretary
P O Box 366
Kensington NSW 2033
Australia

- Please don't send purchase orders — perhaps your purchasing department will consider this form to be an invoice.
- Foreign applicants please send a bank draft drawn on an Australian bank, or credit card authorisation, and remember to select either surface or air mail.
- Use multiple copies of this form if copies of AUUGN are to be dispatched to differing addresses.

This form is valid only until 31st May, 1994

Please enter / renew my subscription for the Australian UNIX systems User Group Newsletter, as follows:

Name: ................................................................. Phone: ......................................................... (bh)
Address: ......................................................................................................................... (ah)
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Net Address: .........................................................................................................................

Write "Unchanged" if address has not altered and this is a renewal.

For each copy requested, I enclose:

☐ Subscription to AUUGN $ 90.00
☐ International Surface Mail $ 20.00
☐ International Air Mail $ 60.00

Copies requested (to above address) ________

Total remitted (cheque, money order, credit card)

☐ Tick this box if you wish your name & address withheld from mailing lists made available to vendors.

Please charge $____ to my ☐ Bankcard ☐ Visa ☐ Mastercard.
Account number: _______ _______ _______ _______ _______. Expiry date: / / .

Name on card: ___________________________ Signed: ___________________________

Office use only:

Chq: bank bsb a/c # _______
Date: / / $ CC type V# _______
Who: ____________ Subcr# _______

AUUGN 113 Vol 14 No 6
AUUG
Notification of Change of Address
AUUG Inc.

If you have changed your mailing address, please complete this form, and return it to:
AUUG Membership Secretary
P.O. Box 366
Kensington NSW 2033
Australia
Fax: (02) 332 4066

Please allow at least 4 weeks for the change of address to take effect.

Old address (or attach a mailing label)
Name: .................................................................
Address: .................................................................

Phone: ................................................................. (hh)

Net Address: .................................................................

New address (leave unaltered details blank)
Name: .................................................................
Address: .................................................................

Phone: ................................................................. (hh)

Net Address: .................................................................

Office use only:
Date: / / 
Who: 

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## Calendar of Events

### 1993

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<tr>
<th>Oct</th>
<th>Event</th>
<th>Location</th>
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<tr>
<td>18-22</td>
<td>IEEE 1003, Bethesda, MD</td>
<td></td>
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<tr>
<td>25-29</td>
<td>INTEROP '93 Europe, Paris, France</td>
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<tr>
<td>26-28</td>
<td>UniForum Common Desktop Environment UNIX Developers Conf.</td>
<td>San Jose, CA</td>
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<tr>
<td>Nov 1-5</td>
<td>LISA VII, Monterey, CA</td>
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<tr>
<td>3-5</td>
<td>NOSSDAV Workshop, Lancaster, UK</td>
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<tr>
<td>29 - Dec</td>
<td>FedUNIX, Washington, DC</td>
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<tr>
<td>3-5</td>
<td>DECUS, San Francisco, CA</td>
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<tr>
<td>29-30</td>
<td>Sun User Group, San Jose, CA</td>
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<tr>
<td>4-10</td>
<td>JUS UNIX Fair, Japan</td>
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### 1994

| Jan 10-14 | IEEE 1003, Irvine, CA                                              |                        |
| 17-21     | USENIX, San Francisco, CA                                          |                        |
| Mar 21-25 | UniForum, San Francisco, CA                                        |                        |
| Apr 11-14 | C++, Cambridge, MA                                                 |                        |
| 25-28     | UNIX Applications Development                                      | Toronto, Canada        |
| Apr 5-9   | SANS III, Arlington, VA                                            |                        |
| May 26    | Networld+INTEROP 94, Las Vegas, NV                                 |                        |
| Jun 6-10  | USENIX, Boston, MA                                                 |                        |
| Jul 11-15 | IEEE 1003                                                          |                        |
| Sept 12-14| Networld+INTEROP 94, Atlanta, GA                                   |                        |
| Oct 23-27 | ACM OOPSLA, Portland, OR                                           |                        |
| Nov 12-18 | DECUS, Anaheim, CA                                                 |                        |

### 1995

| Jan 16-20 | USENIX, New Orleans, LA                                            |                        |
| Feb 21-23  | UniForum, Dallas, TX                                               |                        |
| May 13-19  | DECUS, Atlanta, GA                                                 |                        |
| Jun 19-23  | USENIX, San Francisco, CA                                          |                        |
| Nov 2-8    | DECUS, San Francisco, CA                                           |                        |

This is a combined calendar of planned conferences, symposia, and standards meetings related to the UNIX operating system. If you have a UNIX-related event that you wish to publicize, please contact <login@usenix.org>. Please provide your information in the same format as above.

* = events sponsored by the USENIX Association.
This Management Protocol Profiles CAE Specification addresses communications using the CMIP and SNMP management protocols. RPC-based mechanisms will be addressed in future documents. This document supersedes the XMPP Preliminary Specification, which was published in January 1992.

C303 ACSE/Presentation Services API (XAP)
254p $126.00
XAP is an Application Programming Interface to the connection-oriented services of the Presentation Layer of the OSI protocol stack, including access to the ACSE application service element of the Application Layer. X/Open has defined this API as an interface to support portable implementations of application-specific OSI services and non-OSI applications. This specification describes the XAP API and defines the functions and data structures which it provides for use by applications.

C307 Data Management: SQL Remote Database Access
76p $108.00
This specification relies on the ISO/IEC RDA SQL standard, which specifies a message format for remote communication of SQL database language statements (query and update) to a remote database. This specification defines uses of the message fields and other implementation information such as sequencing and optional features. It shows how SQL statements map to the Remote Database Access (RDA) protocol. This document is the result of a joint collaborative effort between the X/Open data Management Working Group and the SQL Access Group.

C318 X/Open Transport Interface (XTI), Version 2
264p $126.00
The X/Open Transport Interface (XTI) specifies a transport service interface that is independent of any specific transport provider. It is concerned primarily with the ISO Transport Service Definition (connection-oriented or connectionless). However, it may be adapted for use over other types of provider. In particular, this specification includes Appendices showing how XTI maps to TCP and UDP, NETBIOS, minimum OSI functionality (mOSI), and SNA. This Version 2 of the XTI Specification replaces the previous version published in January 1992. The main body of the specification remains unchanged from that previous version, the main differences being the addition of Appendices covering mOSI and SNA.

G207 Systems Management: Reference Model
68p $108.00
This guide is one of several documents within X/Open's Systems Management programme (XSM), the primary aim of which is to promote development of management software that allows an administrator of a distributed system to manage a network of heterogeneous systems as a single logical system. This Guide provides an architectural overview of the Systems Management model, and identifies the various components of the model. It employs object-oriented techniques. This is a high-level model which encompasses both OMG-compliant object-oriented technology and the OSI interaction, and indicates an approach for coexistence of both models.

G302 Systems Management: Managed Object Guide (XMOG)
82p $108.00
This guide is one of several documents within X/Open's Systems Management programme (XSM), the primary aim of which is to promote development of management software that allows an administrator of a distributed system to manage a network of heterogeneous systems as a single logical system. This Guide introduces the essential nature of managed objects, and the necessary framework for defining them. It discusses the managed object definition and development process, and explores the issues involved in registering them. It also discusses conformance testing.

G307 Distributed TP: Reference Model, Version 2
44p $120.00
This document provides a functional description of the X/Open Distributed Transaction Processing (DTP) model, a software architecture that allows multiple application programs to share resources provided by multiple resource managers, and allows their work to be coordinated into global transactions. It describes the use of the DTP model within the X/Open Common Applications Environment (CAE) and is a prerequisite to other present and emerging X/Open documents that address DTP. This document supersedes the previous version of the Reference Model published in 1991 (Doc. No. G120). It has been updated to take account of DTP interfaces developed by X/Open, particularly with regard to how Communication Resource Managers (CRMs) fit within this X/Open DTP model.

P303 Data Management: SQL Cell Level Interface (CLI)
210p $126.00
This document defines the SQL Cell Level Interface (CLI). It provides application programmers with an application programming interface (API) for database access. Both C and COBOL bindings are given. Readers should be familiar with the X/Open CAE Specification, Structured Query Language (SQL), Doc. No. C201. This document is the result of a joint collaborative effort between the X/Open Data Management Working Group and the SQL Access Group.

P312 X/Open DCE: Remote Procedure Call
686p $162.00
This document specifies Remote Procedure Call (RPC) services, interface, protocols, encoding rules and the Interface Definition Language (IDL). The purpose of this document is to provide a portability guide for RPC application programs and a conformance specification for RPC implementations. This document includes text excerpted and/or derived from the Open Software Foundation Application Environment Specification for Distributed Computing (AES/DC) with the permission of OSF.

Q931 X/Open Technical Programme
$270.00
The X/Open Technical Programme is a binder with separately bound parts that describes the Technical Programmes to be undertaken by X/Open over the next three years. Part 1 provides a Technical Roadmap. Parts 2 through 12 each describe a major technical programme area. It is primarily intended for users interested in implementing an open systems strategy and in planning the development or procurement of open systems solutions; for vendors (both software and systems vendors) interested in pursuing an open systems product strategy; and for systems integrators interested in providing open systems integration services and facilities.

For the full publications list, or to place an order, contact Tony Blackmore:
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