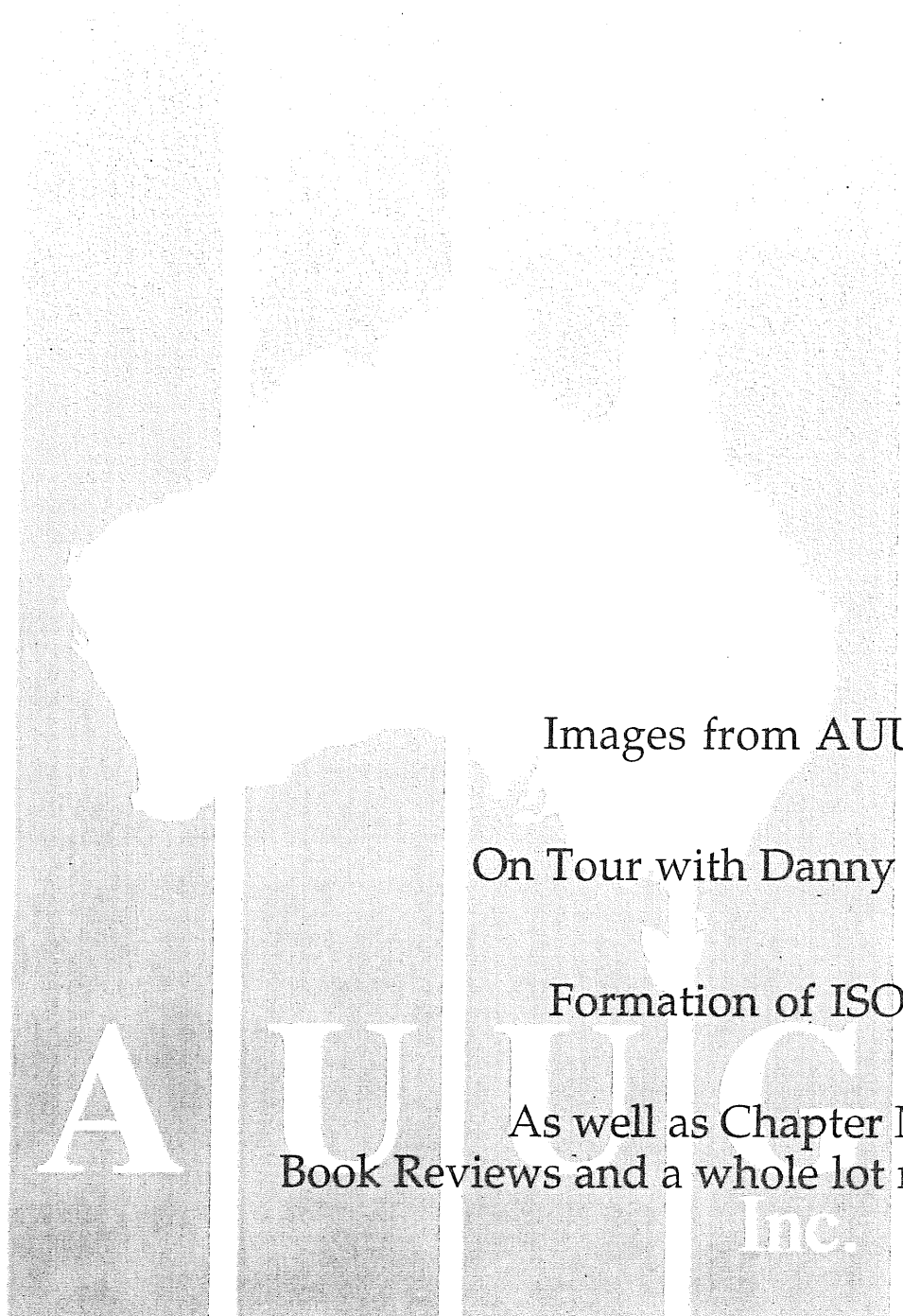


# AUUGN

The Journal of AUUG Inc.

Volume 17, Numbers 5 and 6  
October/December 1996



Images from AUUG '96

On Tour with Danny Smith

Formation of ISOC-AU

As well as Chapter News,  
Book Reviews and a whole lot more..

Inc.

UNIX & OPEN SYSTEMS USERS



# AUUGN

Volume 17, Numbers 5  
and 6

October/December 1996

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# Contribution Deadlines for AUUGN in 1997

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Submission guidelines for AUUGN contributions are regularly posted on the [aus.org.auug](http://www.auug.org.au) news group. They are also available from the AUUG World Wide Web site at <http://www.auug.org.au>

Alternately, e-mail to the above correspondence address, requesting a copy.

## **AUUGN Back-issues**

A variety of back-issues of AUUGN are still available; for price and availability details, 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 copies of the Conference Proceedings from previous AUUG Conferences are still available, at \$50 each for members, and \$60 for non-members. Contact the AUUG Secretariat for details.

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# Editorial

Günther Feureisen <gunther@ibm.net>

The first thing you might have asked when you saw AUUGN in the mail was "Where's the October issue?". The past few months have seen several changes on the Editorial board, including the farewell of Phil Anderson from the helm.

In the ensuing chaos, we found that by the time we had figured out what was going on, October was long gone. So we decided to sail full steam ahead and bring out the value-packed bumper holiday issue - and that's what you hold in your hands right now!

Amongst the changes, Matthew Dawson from the NSW branch of AUUG has joined the fray, along with Frank Crawford and Liz Egan, and yours truly at the wheel, we hope to bring fun packed adventures (or if not, some interesting reading) in future issues. Plans are already afoot for next year - look out for some changes in AUUGN in '97.

Alas, Phil has had to move on, but I'd like to thank him on behalf of AUUG members for his work on AUUGN. If not for Phil's undertaking, AUUGN may have faded away into nothingness.

So, sit back, pour yourself another glass of something bad-for-your-body and enjoy the issue!

As it's the festive season - from all of us here, we hope you have a Merry Christmas and a happy New Year!

See you in '97! ❖

---

## President's Column

Michael Paddon

It can be argued that industry of ours requires a certain commitment, or even obsession, if you truly wish to succeed. Perhaps it is inherent in the exacting nature of the software business, where one misplaced detail can separate achievement from disaster. In any case, whether you are designing, building, explaining or selling, ours is a vocation that demands focus.

Now, of course, a broad brush assertion such as this is best debated over a fine wine of some description,

so please take this opportunity to equip yourself now before we proceed any further.

Back again? Excellent, let's forge ahead.

In many ways, it is obsession that makes our industry tick over. It is from this motivation that springs the finely crafted code, and the urge to share our labours freely. Only a remarkable single-mindedness can explain the creation of an operating system in which everything is a file, or a global network built from a single protocol.

It is this level of intent which produces the software that we all admire (a long list is available upon request...). But even more admirable is the immense purpose and energy displayed by the creators of the code we love to run; indeed, it is a quality that transcends technical merit and engineering philosophy.

Let's make a leap of faith. We are all creators in our industry, each and every one of us. Sure, we all do different jobs, and sometimes our contributions are not as visible as those of, say, Dennis Ritchie or Larry Wall or James Gosling or [insert favourite icon here]. Nevertheless, we add a piece of ourselves to the world, and change it a bit in the process every day. Such is the beauty of our industry.

As an aside, it's amusing to note that many of us would probably be doing what we are today, even if we didn't get paid. Don't tell my boss...

So, what the hell is this reflection doing in an AUUG column? Well, quite simply, while we are all creative, obsessed and focused people, our dear old AUUG hasn't reflected our temperament. In fact, over the years AUUG has grown fat and complacent and, well, kind of comfortable.

Let's not dwell on examples... I think you all know what I mean.

The news is simple: this has all changed. It hasn't happened overnight, however. The AUUG executive has been working hard for over two years to re-orient our organisation, and to give it a good, old fashioned cold boot.

The results are starting to be visible. We ran two roadshows in 1996:

David Flanagan's Java tutorial and Danny Smith's security update. Both were well attended, and

generated enough income to enable us to plan three similar events next year.

In addition, we ensured that every state and territory hosted at least one of these event. If you only got to see one, we truly regret it, but our geography makes visiting every chapter in two weeks a somewhat daunting task. In any case, we remain committed to servicing all of our members, throughout the country, to the limits of our abilities.

This commitment is also reflected in a new venue for the Winter Conference. AUUG 97 will be held in Brisbane, breaking a Melbourne-Sydney duopoly of almost a decade. Generating and substantiating the support to hold an AUUG conference in another state has been a personal goal of mine since election to the executive, and it is with great satisfaction that I make this announcement.

Another indicator of our new aggressiveness is the theme of the conference: "Technical Solutions". It's time for AUUG to remember that it's *raison d'être* is to support and articulate for the technical open systems community. Encouragingly, our sponsors have been very supportive of our newly found focus, feeling that a stronger technical AUUG will enhance their marketplace opportunities.

Mark White and George Michaelson are already hard at work on the 1997 conference, as the conference chair and programme chair respectively. If you wish to volunteer your time to their endeavours, please don't hesitate to get in touch with them. Soon, also, you will be seeing the call for papers, and you will remember my statement that the best way to help out is to submit your work for consideration.

Another sign of change you'll see is in the new editorship of AUUGN. Phil Anderson has performed a sterling job of recreating our journal to reflect the priorities of the current executive, without losing continuity with the AUUGN of yesteryear. The result is a leaner and meaner publication that will bear Phil's stamp for many years to come.

To our deep regret, Phil has had to relinquish the editorship of AUUGN due to other commitments (I warned you about getting a life, didn't I?), and the role is being taken up by Gunther Feuereisen, starting with this issue. Thanks for everything, Phil. AUUG would have been a much poorer place without your efforts.

As Gunther comes to grips with AUUGN, you will be seeing more changes again. The executive has already discussed the benefits of a quarterly AUUGN as opposed to the current two-monthly schedule. We would be most interested in any opinions you have around AUUGN, schedule related or otherwise, and I am sure that Gunther would be particularly encouraged by submissions for publication.

There is no doubt that each of these changes that I have touched upon will upset some. I, and the AUUG executive, offer no apologies for this. Our organisation was running in grave danger of becoming less and less relevant to you, the members, and we have been forced to reassess why we exist and what we can deliver.

If you feel a resonance with our goals, however; if you believe that a strong technical user group has a place to play in our industry for the betterment of the science of design, the engineering of code, the art of management and the plying of commerce, then we are grateful for your continued support.

To round off my report, I'd like to touch upon some recent activities of interest. The AUUG Chapter Council is held once a year, and is a chance for all the regional groups to get together and do some combined planning. This year's council discussed several issues: how to stage interesting local meetings (and entice the you to attend), scheduling the Chapter Technical Conferences to allow an international visitor to be shared around the country and, inevitably, finances.

AUUG has roughly the same level of assets as it had three years ago, however, in the intervening time we have set up the chapter system and been very effective at distributing funds for regional use. The upshot of this is that where we used to have one big bucket of money, there is now a number of smaller buckets. At the Council it was decided to combine these buckets back together again, with each chapter's funds still being accounted for separately, into a single pool. This will allow a much more effective use of funds, especially in respect to cash flow management and interest rates.

Another event of recent note was the formal creation of ISOC-AU, the Internet Society of Australia, and the election of their board of management. AUUG has actively supported the establishment of ISOC-AU and we are enormously pleased to see this process bear fruit. AUUG sees ISOC-AU as a sibling body (indeed we share much the same membership, and many of the same

concerns) and we look forward to working closely with them to promote the Internet, open systems and the interests of our respective memberships.

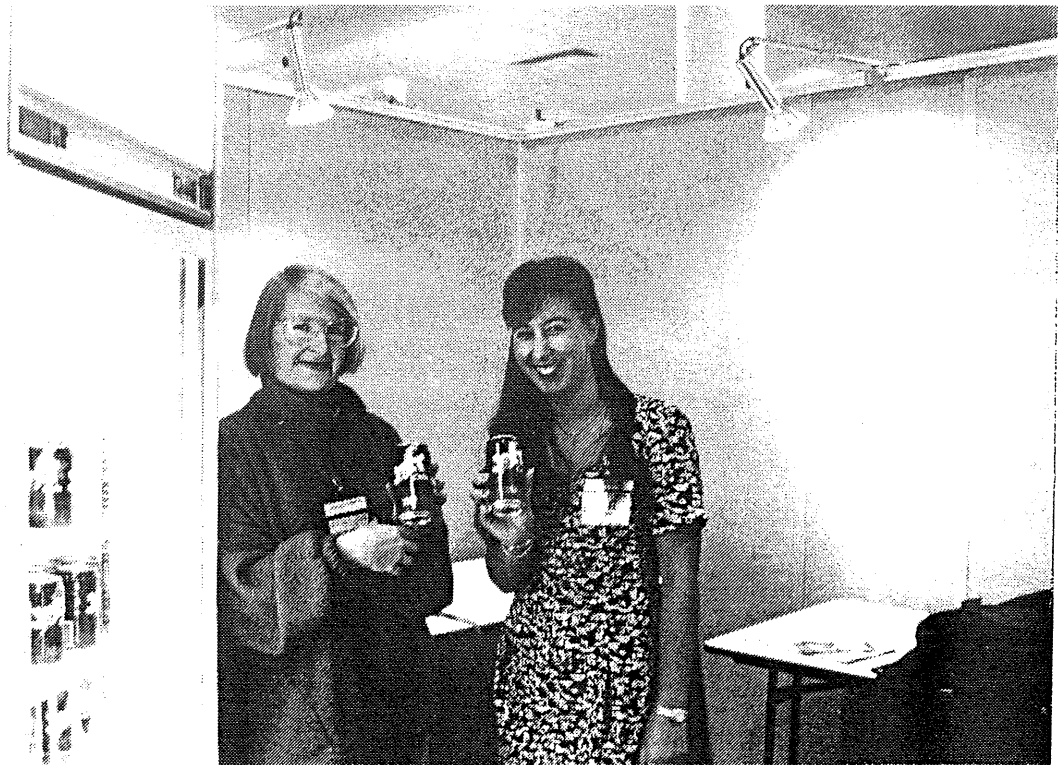
Last, but certainly not least, please allow me to draw your attention to the re-publication of John Lion's 6th Edition Unix book. This famous volume contains the entire source to 6th Edition as well as detailed notes and annotations explaining the code. The reprint also contains additional commentary from various well known writers, which add perspective to the original text.

I could go on and on about the cool cover, etc, etc, but let's cut to the chase. Once upon a time you had to scrounge a 5th generation photocopy to own one of these. Now you can buy a legitimate copy of this piece of Unix history, and it won't get all dog eared and fall apart. What are you waiting for?

You're waiting for the 15% discount AUUG has arranged of course. Check out this issue of AUUGN or get in touch with us for more information.

Finally, on behalf of AUUG, I'd like to wish you a safe and enjoyable holiday season. See you all next year! ❖

Pauline Van Winsen and Liz Egan (AUUG Business Manager) showing us their preferred caffeine source :-)



# AUUGN

is your journal!

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We're looking for:

Talk to your local Chapter contact for ideas, and see elsewhere in this issue for submission guidelines.

- Papers
- Reviews
- Articles
- News
- Comment



UNIX® AND OPEN SYSTEMS USERS

# CALL FOR PAPERS

## Technical Conference Series 1997

The AUUG *Technical Conference Series* will be held Australia wide in every state and territory, between February and April 1997 with the following dates confirmed:

- |            |                |            |                |             |                |
|------------|----------------|------------|----------------|-------------|----------------|
| • Canberra | 12-14 February | • Sydney   | 20-21 February | • Melbourne | 25-26 February |
| • Hobart   | 19 February    | • Darwin   | 17-19 February | • Brisbane  | 24 April       |
| • Perth    | TBA            | • Adelaide | TBA            |             |                |

Dates for Perth and Adelaide are currently being confirmed and as each city finalises their date, it is being posted on the AUUG web page at <http://www.auug.org.au> along with further information.

AUUG invites proposals for papers and tutorials relating to the technical aspects of Unix and Open systems.

Presentations may be formatted as tutorials or technical papers, and should be geared at an audience requiring in-depth knowledge.

Technical presentations should be approximately 45 minutes, including a 5-10 minute question time.

Tutorials, providing a more thorough presentation, should be either a half-day or a full-day in duration.

### **Submission Guidelines**

Those proposing to present papers should submit an extended abstract (1-3 pages) and a brief biography.

Those submitting tutorial proposals should submit a plan for the tutorial and a brief biography.

Please indicate on your proposal whether it is a paper or tutorial, and for tutorials whether they are half day or full day.

### **Location**

The conference series will be held Australia wide, so please indicate in which city you wish to present - however, you can do so in more than one!

### **Speaker Incentives**

Presenters of papers are afforded complimentary conference registration.

### **Tutorial Incentives**

Tutorial presenters will receive either a flat fee or a negotiated percentage of their tutorial profit.

For further information or to submit a proposal please mail:

AUUG Inc, Level 4, 90 Mount Street, NORTH SYDNEY NSW 2060

Email: [auug@auug.org.au](mailto:auug@auug.org.au)  
<http://www.auug.org.au>

Ph: 1-800-625-655



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# Formation of ISOC-AU

*Frank Crawford*

Australia is about to enter a new era as far as the Internet is concerned. On the 15th November, the Internet Society of Australia (ISOC-AU) was formed, and more importantly, their Inaugural General Meeting will be held in Sydney on Wednesday 27th November, at the Haymarket Campus of UTS. In fact, this is not far from where the Interop Exhibition is being held. More details of the IGM can be found on the society's web page at <http://www.isoc-au.org.au/>.

Why is this important? It allows Australia to have a much bigger say in the structure of the Internet world-wide. As far as any group on the Internet can be said to control the Internet, the Internet Society is the governing body, and ISOC-AU is a chapter of the world-wide body.

The roles of the Internet Society are varied, but primarily to maintain and extend the development and availability of the Internet and its associated technologies and applications. It does this by managing the standards process, including Internet RFC's, conference and general dissemination of information.

It is notionally the source of authority for Internet domain names, although they do not really exercise this authority, preferring to delegate it to other groups. This has some relevance to the current debate on domain names within Australia, however, ISOC-AU has no intention of being involved in this at the present time.

What ISOC-AU is more interested in is in establishing an body that represents the Internet users in Australia, be they individuals or organisations, both nationally and overseas. While there are a number of organisations that represent different parts of the Internet community, be they service providers, system and network administrators or the general users, there is no organisation that attempts to represent them all. This is the aim of ISOC-AU.

ISOC-AU currently only accepts individual and student members, and fairly obviously, is attracting most of the influential people in the Internet scene

in Australia. These include Geoff Huston, Hugh Irvine and Bob Kummerfeld who have acted as the founding board guiding the organisation through to the Inaugural General Meeting.

As well it has the declared support of AUUG, SAGE-AU, ACS and the major ISP's within Australia. All these groups can see the advantage of the formation of ISOC-AU, as a means of focusing the Internet work within Australia and to provide access to the wider global Internet community.

Founding membership is currently available, and will be until the IGM, on the 27th November. As well, a call for nominations for the initial Board of Directors has gone out, and is open to anyone who is a member by the time of the IGM. For those who aren't able to join before the 27th, membership will be available at UTS, just prior to the IGM, or at the ISOC-AU booth in the Interop Exhibition.

More information about the formation of ISOC-AU can be found on their Web page, <http://www.isoc-au.org.au/>, which includes the details of membership, a list of the current nominations for directors, and other information relevant to the organisation.

As a final note, ISOC-AU is keen to involve as many people as possible, with plans for those not able to physically be at the IGM, to be able to participate from regional centres, over the Internet.



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## On Tour: Security Seminar

*Lucy Chubb*

Danny Smith, Operational Manager of AUSCERT, is certainly someone whom you would expect to know what he's talking about when it comes to computer security. Over 150 people around Australia came to hear Danny give his one day tutorial during November on a tour of various capital cities organised by AUUG.

In Sydney, his fifth presentation in this series, Danny took the absence of a carousel on the projector in his stride and spoke directly from the printed notes until morning tea.

Danny talked about the nature of security and some common misbeliefs such as putting effort into countering accidental threats while not bothering as much about deliberate threats or the belief that a firewall by itself will make a network secure without worrying about other aspects of security (the "hard crunchy shell with a soft chewy inside").

An overview of the changing nature of security incidents reflected the changes in the size of the Internet and the type of users making up the bulk of that increase. There are many new users and new sites which don't have any security experience. Moreover, intruders have been working on new and more sophisticated attacks and communicating them amongst their peers very effectively using, for example, anonymous ftp servers. Some very sophisticated attacks based on the analysis of operating systems source code and standard Internet protocols are now being seen.

Effective security requires a security policy. That security policy has to have the right things in it and be tested (all software has bugs the first time it's run, doesn't it? Why should the security policy be different? Do you really want to find out what you should have done after a disaster happens?). Even if the policy is right for your company at one time, that doesn't mean it will stay that way. The policy must make it a policy to update the policy regularly.

Having the right things in a policy will mean being able to evaluate the risks that affect your site properly. Some risks, like the value of (and

hence the risk of losing) reputation through being broken into are very hard to quantify. For AUSCERT, for example, that reputation is almost priceless.

One of the drawbacks of password based authentication is ensuring that the chosen passwords cannot be easily cracked. The total key space for UNIX is quite large, but often only a tiny part of it is used - making it easy for intruders to search. However, there are tools to help enforce good choice of password and alternatives such as identity cards and biometrics (for example, finger prints or retinal scans). Combining more than one technique strengthens security further.

There are a number of system administration tools that are not shipped by vendors, but which may be useful for increasing security or tracing an intrusion. Danny went through a number of these and described their use (being careful to point out that the risk from using them rests with the organisation that decides to use them).

The sections on checking for intruders and responding to an incident gave advice on what to look for when an intruder is suspected and what to do (particularly as it is easy to panic and do something inappropriate which will make the recovery process take longer than it really needed to). AUSCERT plays a role in both preventing intrusions through Security Advisories and in assisting with a response. Anyone interested in what AUSCERT does and how to register can have a look at their web page at <http://www.auscert.org.au/>

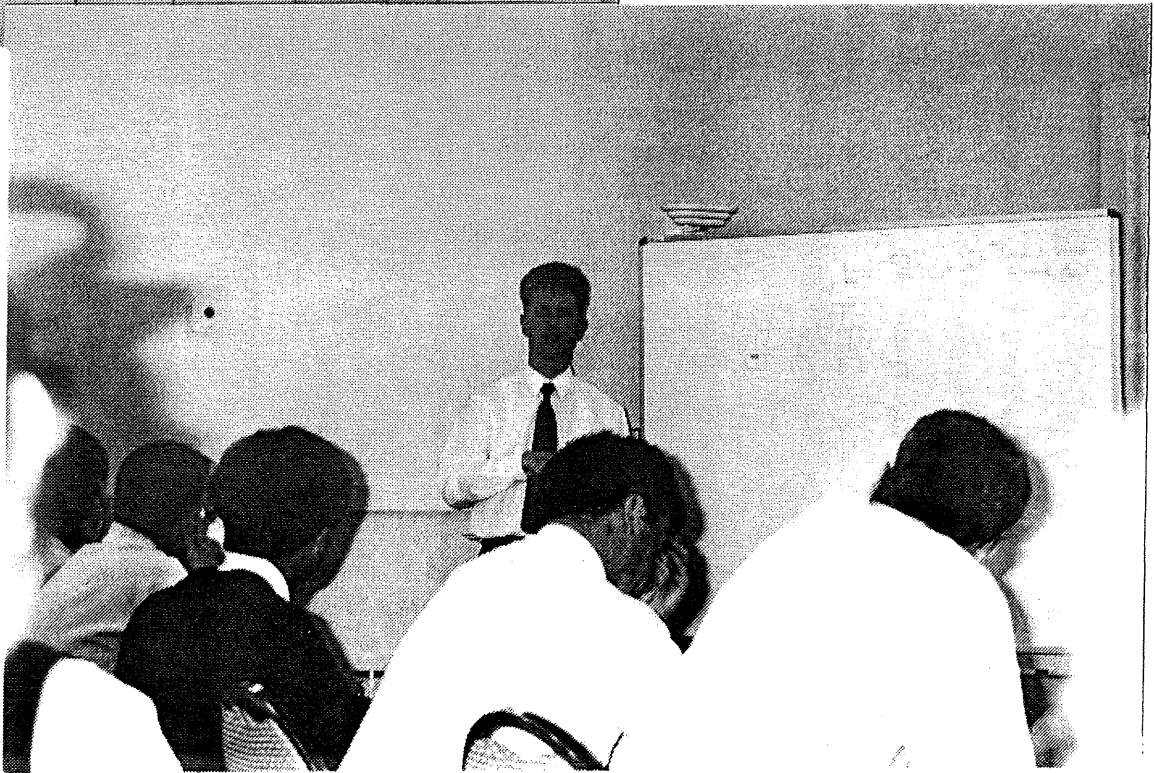
At the end of the tutorial Danny left time for questions and judging by the response from the attendees at the Sydney tutorial, the question time could have gone on for quite a bit longer if time hadn't run out.

This has been another successful tutorial roadshow. Danny is committed to spreading the word about computer security, so when you see his name again in the future, you should seriously consider going to hear him. ❖



Danny Smith at the Security Seminar.

Danny Smith again. Somethings tells methe guy in the front row would rather be somewhere else..





Pauline Van Winsen, Lucy Chubb (AUUG Exec) and Danny Smith looking rather angelic

Morning Tea at the Security Seminar. Looks like Frank's preferred cookie of choice is choc-chip!



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# Standards groups do not stand still

*Phil McCrea*

It's interesting to watch the current machinations in the so-called 'open' industry consortia groups. There are not so many of these organisations these days as there used to be back in the heady days of the Unix wars. Remember the Unix International (UI) v Open Software Foundation (OSF) wars, so beloved by the press? These skirmishes almost single-handedly delivered the desktop to Microsoft, as the opposition was fragmented and bent of demolishing each other. Microsoft didn't have to adopt a divide-and-conquer approach - the opposition came up with it themselves!

As time moved on and Unix became accepted as 'mainstream', gradually UI and OSF ran out of puff. They merged to form the Open Group earlier this year, and in fact their new Chairman, Joe de Feo, took up the helm a few weeks ago. De Feo is the ex chief IT manager from Barclays bank.

The X Consortium, based at MIT was another open organisation, whose mission was to promote and develop the X interface standards, which forms the basis of windowing environments on Unix workstations. It was hoped at one stage that X might become a true, vendor independent windowing environment for all workstations and PCs. Alas, whilst X is still alive and well, it has largely been overwhelmed by the sheer market penetration of the Web. The X Consortium has decided to call it a day, and it will join the Open Group by the end of the year.

The other remaining open organisation which has been around for some time is the Object Management Group (OMG). Since the topic of objects is still a hot area, there is still a fair sized agenda for OMG. And its agenda has become a little bigger in the past month or so, courtesy of Microsoft. Microsoft, of course, has been the bete noire of the 'open' world, choosing to establish its own standards and interfaces, and publishing enough material to enable third party developers to create programs that work with their software.

Microsoft has used a plethora of terminology to describe its interface standards, such as Object Linking and Embedding (OLE), Common Object

Model (COM), Distributed Common Object Model (DCOM), MAPI and ActiveX. ActiveX is the most recent term and was supposed to encompass OLE and the others. In a surprise move several weeks ago, Microsoft decided to hand ActiveX technology over to The Open Group. The Unix standards body now embracing Microsoft standards?

There are several intriguing aspects to this move by Microsoft.

Firstly, it's worth noting what a little healthy competition from Java can do!

Secondly, it has created an interesting political situation between the Open Group, and OMG. OMG have been promoting its Corba architecture as the basis of distributed objects, and virtually every software vendor has pledged allegiance. ActiveX, however, is not fully compatible with Corba, and this creates the interesting political situation where the Open Group and OMG are now supporting incompatible object standards.

Not surprisingly the non-Microsoft world, led by Oracle, has reaffirmed its allegiance to Corba, which forms the basis of its Network Computer Architecture, which a host of hardware and software vendors are supporting.

The third interesting aspect is that a recent issue of Client Server News reports that Microsoft is having second thoughts about handing its crown jewels over to a standards body! Microsoft has declared that OLE is apparently not now of ActiveX, and hence OLE will not actually be included in the material that will be handed over to the Open Group. How the Open Group reacts to this will be interesting.

It is still the case that the term 'standards' and 'politics' are largely synonymous when it comes to industry bodies. Stay tuned. ❖

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# Searching for needles in haystacks: an Internet detective story

*Pauline van Winsen*

Earlier in the year the router, the device which connects our company network to the Internet, started reporting that it was receiving data in the form of packets from the Internet which claimed to be from a host on our internal network. Sending packets to a site with a source IP address of a host at that site is known as IP spoofing and generally means someone on the Internet is up to no good. Many hosts on the Internet use source IP addresses as a means of authentication. If you can forge packets with a source IP address of a host local to a network from the Internet you may gain access to services which are supposed to be restricted to the local network.

At first the packets were thought to have a malicious intent as my company does a lot of Internet security related work and the packets started appearing on April Fool's Day. Our Managing Director with his notorious sick sense of humour had also announced our own WWW server, <http://www.uniq.com.au> on the 1st April and it was thought all these factors might be related. How wrong one can be?

When we started receiving packets from the Internet from not just one but six different hosts, concern mounted. By this time I was running reports on the router violation logs a few times a day and a pattern started emerging. The violations appeared mostly between Australian Eastern Standard Time business hours. I started to suspect someone, I'll call them "Company X" from now on, out on the Internet had picked our IP address out of the air and had started using our IP address on the Internet. Company X was probably wondering why their network was performing oddly. If they were using our IP address all their packets would wind up on our router as this is where the Internet road-map sends packets destined for our IP address. If Company X managed to convince an Internet service provider to change the Internet road-map to point our IP address to their router, our legitimate traffic would be sent to their site. This would be disastrous

for our business and presumably this problem was already impacting Company X business as well.

connect.com.au, our Internet service provider (ISP), were asked to investigate the packets and unfortunately they told us the packets were coming from outside of the connect.com.au network, most probably from a Telstra Internet customer or a customer of an ISP connected to Telstra Internet.

A call was then logged with the Australian Computer Emergency Response Team (AUSCERT). AUSCERT respond to computer security incidents within Australia and are an invaluable resource for any organisation connected to the Internet in Australia. The AUSCERT staff were supportive but said the nature of the packets made it near impossible to trace, much like looking for a needle in a haystack.

Luckily we had pretty sensitive magnets and a lot of help, as it turned out, from Microsoft. The packets were SMB broadcast packets, the type flying around most networks running Microsoft's standard LAN Manager network implementation. One of my colleagues mentioned that there was a version of the popular ethernet snooping program, tcpdump, which decoded these packets. I quickly found the modified tcpdump source code on an ftp site on the Internet. We gave a resultant modified tcpdump binary to connect.com.au with instructions and waited. A few days later we obtained a log of decoded SMB broadcast packets destined for our network. The decoded SMB packets contained user information and a company name. In fact, everything but the draft company report.

I used the Yellow Pages web server, <http://www.yellowpages.com.au> to look up the company name in order to find a phone number. I was desperately hoping Company X would be based in Australia. It must have been my lucky week as I found one company in Sydney which matched the company name.

It was really comforting to ring Company X and find the person who answered the phone was one of the users mentioned in the decoded packets. Company X was using our IP addresses because they had pulled our IP address out of the air when they set up their network some years in the past. Company X believed they had security mechanisms in place to stop traffic leaving their network for the Internet. Company X have since altered their network topology so that we no longer see their traffic.

What did we learn? We learnt that it is quite expensive when someone does the wrong thing on the Internet however innocently. Tracking this problem down cost our company time and resources. We learnt that seemingly innocuous services leak a lot of company information. We hope that Company X has learnt that it is extremely unwise to use IP addresses which are not registered or which belong to some other site. If Company X had misconfigured other Internet services, such as electronic mail, we could have started receiving other traffic which should have remained internal to their network.

We learnt that it was valuable to have responsive technical staff at the ISP as well as having technical resources in house who could understand and deal with the problem. We learnt that registering with bodies like AUSCERT and adhering to AUSCERT advisories was of immense importance. We would never have realised we had a problem had the AUSCERT recommended anti IP-spoofing filters not been in place on our router. AUSCERT registration information can be obtained at <http://www.auscert.org.au>

If you are planning on joining the Internet, make sure you understand the risks, make sure you understand your own network topology, make sure you register with AUSCERT and make sure you are using your own registered IP addresses or are using RFC 1918 addresses behind a firewall. RFC 1918 lists a large number of IP addresses which are never to be routed on the Internet, and thus can be safely used on internal networks with no direct Internet connectivity. A searchable RFC index can be found at <http://www.cs.rutgers.edu/cgi-bin/rfc>.

Given the number of sites which are using unregistered IP addresses I have seen during the course of my work, I can only assume our problem is apparent all over the Internet. If it happens to your site good luck in tracking it down. If your site is using unregistered IP addresses please rethink your network topology for your own security and for the sanity of the poor site administrator whose IP address you have stolen. ❖

*The author, Pauline van Winsen, is a Senior Technical Consultant for Uniq Professional Services and serves on the AUUG executive committee. She can be reached by sending email to [pauline@uniq.com.au](mailto:pauline@uniq.com.au).*

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## Scientific computing: A forgotten discipline?

*Brian Salter-Duke*

Phil McCrea's comment in his the AUUG Newsletter, AUUGN,

"Very few computers are used for number crunching these days - possibly only supercomputers, and the odd spreadsheet calculation"

... is so far off reality that I am beginning to think there is a conspiracy to drive us poor scientific computing folk out of the computing world by pretending we do not exist. After all, the ACS has ignored us for years and now seems to think computing is just a branch of business management. I thought AUUG would know better.

It is wrong in two ways. First, lots of computers are used for number crunching. Second, they are not only supercomputers. Most number crunching these days is done on UNIX workstations.

I have used the ANU Supercomputer and may use it again, but I do not use it now. Last year, three colleagues and I obtained a DEET Infrastructure grant that has purchased two DEC Alpha 3000/800s. Both are now flat out number crunching. I also have a small IBM RISC 6000 and access to a larger university one. I often drive these hard crunching numbers. My field is computational chemistry and it is a rapidly growing field. In the US the number of graduates employed in this area has been growing exponentially for 10 years. Most are in industry. Many workstation vendors have specifically targeted this group in their sales material. Computational chemistry does include some symbol manipulation and some CAD-like graphics, but it uses lots of CPU hours crunching numbers. Most of it is done on workstations. Some is done on fast PCs (you should have seen the fuss in our community about the pentium floating point bug - it matters). The supercomputer is often the last resort for really big tasks. Computational chemistry is just one of the activities that is still happily crunching numbers. What about environmental modelling, weather forecasting etc. All these activities are growing, not declining. The

very complex modelling of all aspects of our complex world will show a vast expansion in the next few decades.

The move here to workstations from mainframes and supercomputers has implications for AUUG. People like me are now also system administrators and

we need to know a lot more about the operating system than we did 20 or more years ago (I go back 35 years to Mercury Autocode!). The operating system is now almost always UNIX.

While the major of PCs are text manipulators, I estimate a majority of workstations spend a significant part of their time number crunching. The people who run them need the support of AUUG. Just my \$0.02 worth. ❖

*Brian Salter-Duke, is from the Northern Territory University and can be reached on b\_duke@lacebark.ntu.edu.au.*

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## AUUG Key Signing Service

*Pauline van Winsen*

At the AUUG96 and Asia Pacific World Wide Web Conference held in Melbourne AUUG was pleased to announce the provision of a new public service: signing PGP public keys for the purpose of introducing people to the PGP "Web of Trust" in a simple and convenient manner.

There is a publicly, and internationally, available privacy program called PGP, Pretty Good Privacy. PGP uses public key cryptographic techniques to allow messages to be exchanged between people across public networks, while both protecting the privacy of the contents and guaranteeing authenticity of the sender.

One of the problems with public key cryptographic systems has been one of authentication. How do you know, for sure, that the person you think you are sending secret messages to is really the person you wanted to send it to? The answer to this problem is to have trusted parties who introduce you to other trusted parties. This is what the PGP documentation calls the "Web of Trust".

The AUUG PGP key signing service aims to spread the use of PGP technology by expanding the Web of

Trust, acting as an introducer for PGP keys. AUUG, by virtue of the conferences and meetings it holds, is in a position to physically meet with people, verify their identity, and issue key signatures attesting to their identity.

To reverse the preparation of key signing AUUG created some "shared secrets" which were given to people who turned up at the AUUG stand at the AUUG96 conference, providing the person had filled out an appropriate form and had produced two forms of identification (one with a photograph). When a holder of a shared secret creates a PGP key they will send the public part of this key along with their half of the "shared secret" in encrypted form via email to AUUG signed with their PGP key. If AUUG verify all the information they have sent is correct AUUG will sign the and return the key via email.

So what do you have to sign on the form? You state that you are who you say you are, and indemnify AUUG from liability if you have misrepresented that. You agree to notify AUUG if you revoke (or lose control) of your own key.

When you come along to a future AUUG event or local AUUG Chapter activity, sign the form, obtain a secret and thus organise to have your PGP key signed. Don't forget to bring two forms of identification with you. Make sure one of these forms of identification includes your photograph. More information about the PGP key signing service is available at <http://www.auug.org.au> Future PGP key signings will be available at local Chapter activities and subsequent AUUG events. Please contact your local Chapter for more information. ❖

*AUUG acknowledges the USENIX Association, whose service this is based on, and the assistance of Qualcomm Australia in implementing the service and providing materials.*

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## How Do You Make Use of Petaflops?

*Frank Crawford*

While Australians have trouble trying to work out how to make full use of a Pentium Pro, and Australian industry considers a fast workstation to be the fastest computer they need, American

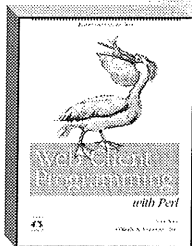




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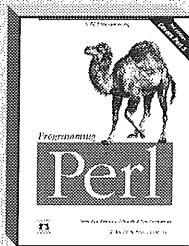
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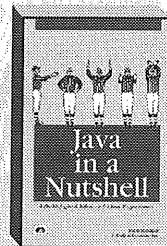
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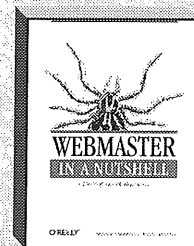
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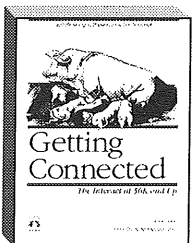
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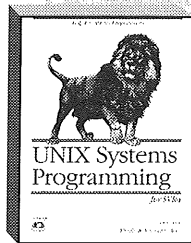
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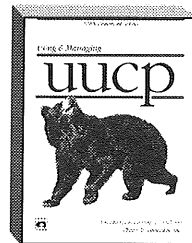
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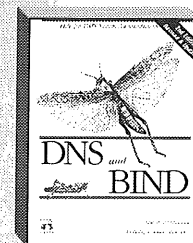
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researcher's are looking at developing computers that run at Petaflop rates.

To understand this, 1 Megaflop is one million Floating Point Operations per second, and is the standard measurement used in high performance computing, where floating point calculations are far more important than a simple count of machine instructions (MIPS). Further, there is no general relationship between MIPS and FLOPS, as this is very dependent on the machine architecture.

Put in more common terms, a 200MHz Pentium Pro has been rated at 13.733 Mflops, while a 120MHz Pentium has been rated at 3.121 Mflops. Looking at more powerful machines, a Fujitsu VP2200, a supercomputer of five years ago, had a rating of about 25 Mflops in scalar mode and 1.25 gigaflops (Gflops) or 1250 Mflops. ANU's new VPP300 has thirteen 2.2 Mflops processors, giving a theoretically maximum performance of 28.6 Gflops.

Taken even further, the US Grand Challenge problems require systems that are capable of 1 teraflops (Tflops) or 1000 Gflops. Now, researchers are planning systems that will run at 1 petaflops or 1000 Tflops. If all this power could be harnessed for a single job, then it would be able to perform the equivalent of 2 years of calculations on a Pentium Pro in a single second.

However, in reality, this is not how such a system would be used. For a start, such performance is only achieved through the use of massively parallel architectures. It is estimated that a petaflops system would require over 10,000 processors, and the complexity of programming such a system makes it unlikely that the theoretical maximum could be sustained for very long.

Even more importantly, it would be very rare that a single job would have access to the entire resources of such a system, rather a number of researchers would have access to a subset of the resources. As an example, while in exceptional cases it may be possible to get access to all thirteen processors on ANU's system, the most made available for normal jobs is only 8, and for certain classes of jobs, only a single processor.

Now of more interest in the use of such systems, is the issue of programming. As has previously been demonstrated with such systems as Thinking Machine's CM2 and CM5, programming massively parallel systems is a complicated process, and only suitable for a limited range of problems. Programming these systems will be performed by

specialists, who will aim to get the maximum advantage from the use of the architecture and design of the entire system.

The architecture of the petaflops system is just as complicated as the details of the individual processors. The problem of keeping data flow up to the system, either from RAM or from even slower peripherals, will provide challenges both for hardware designers and programmers. Consider how fast a Pentium would run if it had no RAM, and all data access was directly from the hard disk.

Even more of a problem is the issue of I/O data rate for those using the system. Imagine how much data can be generated on a PC in two years, and then compress that to one second. Presented in a traditional form it would certainly be an information overload, and hence, new presentation mechanisms will need to be explored.

Finally, such a system is unlikely ever to be seen in Australia simply because of the cost. When most corporations can fulfill all their needs with a powerful workstation, and those that need a bit more power are usually part of a multinational, and can use the bigger systems of their overseas parent, none are likely to invest in such computing power here. ❖

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## How to Handle Spamming

*Catherine Allen*

One of my favourite things in the world is email: what better medium to say hi to a friend or to share important work-related information? Email is the keystone of the paperless office and the telecommuter's life-line - I think it's the best thing since sliced bread! Unfortunately, I'm not the only one who thinks so - hordes of marketing wannabes see email as a great way of reaching thousands (or millions) of people at almost no cost to themselves. In cyberspace, this sort of email is known as "spam".

What's so bad about spam?

Firstly, many Internet Service Providers (ISPs) worldwide charge by the amount of information received, so the receiver of the spam pays for it, even though they didn't want it! Secondly, it's

very difficult to hang an effective "no junk mail" sign on your electronic mailbox.

Thirdly, and perhaps most importantly, most spams are not the innocent glossy brochures you find in your mailbox on a Saturday - they're often make-money-fast scams or highly offensive rhetoric. The most recent spam I received was an offer to sell child pornography.

So how can you protect yourself (and your loved ones) from the evil of spam?

1. Check that your ISP's Acceptable Use Agreement includes penalties for

Internet abuse like spams.

2. Check out the filtering capabilities of your mailer. If it doesn't have any, look into getting a mail filter.

3. Many automated address collectors use newsgroup archives to gain address

lists, so if you post to news, use an email address like "NO\_JUNK\_MAIL@anywhere" or "John.Doe@anISP.net.au@remove.this.to.email.me".

These invalid addresses may fool the automated address collectors but

(hopefully) won't fool real people who want to contact you.

What should you do if you receive a spam?

1. Do not reply to the sender - spammers often fake the return address.

Do not send email "bombs".

Do not make a denial-of-service attack against the address or site where

the mail appears to have originated as these may be fake.

2. Check that your mailer is showing all possible email headers.

Lines which start with the following keywords give clues about the

identity and location of the spammer (although some may be faked):

From:

Sender:

X-Sender:

Reply-To:

Errors-To:

Return-path:

Path:

Received:

3. Make a list of all hostnames and domains mentioned in the headers and

the body of the message.

4. Contact your system administrator (or the help desk of your ISP) with

this list. They can use this information to contact the spammer's ISP,

which will hopefully deal with the spammer in an appropriate way.

5. If the spam continues, post a copy with full headers to the newsgroup

news.admin.net-abuse.misc

If the spam includes references to pornography or other illegal activity (like pyramid scams or chain letters), it may be worthwhile suggesting that your ISP contacts the Australian Federal Police about the matter. ❖

For more information, please see <http://kryten.eng.monash.edu.au/gspam.html>

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## Internet security - what technology can't solve!

*Pauline van Winsen*

In the last few months there have been a raft of newly exploited Internet attacks. Some of the attacks aim to destroy or ruin an organisation's reputation by altering their web pages. This attack was successful against both the CIA and the US Department of Justice. Other attacks are based purely on denying service to an organisation by flooding their site with particular packets. This last attack is known as a "SYN" attack and has been used to put Internet Service Providers off the air.

The latest version (8.8) of sendmail, the popular implementation of the mail transport protocol, was released complete with a major security vulnerability. Unfortunately, another security vulnerability was found in the patched release so this was replaced shortly after by sendmail-8.8.2.

These three separate attacks highlight the many issues owning an Internet presence which technology fails to address. These issues include:

- Cost of ownership - an organisation has to invest resources in making sure their security technology is

up to date. History has shown that as soon as one vulnerability is closed, another one will be found.

- The risks of extending trust to an Internet Service Provider - how secure is your ISP's web site and can you be confident about the integrity of your organisation's web pages?

- What is secure today will probably be insecure tomorrow - what processes does your organisation go through to ensure that the Internet technology is resistant to known attacks?

- Intruder detection and incident response - How does your organisation know when it has suffered a security breach and how does it respond when a breach is discovered?

Unfortunately many of the decisions surrounding these issues are not addressed at all or are left to be solved by systems administrators, external contractors or security technology vendors. These people will no doubt have the organisation's best interests in mind, however they may not be aware of all the requirements to protect data and infrastructure. Typically they do not address legal requirements to protect information.

It is also an unfortunate fact that many organisations do not invest in developing policies and procedures to address non-technical security issues until they have been successfully attacked. A recent survey has also shown that many organisations also are attacked by insiders.

However, there are a large number of steps an organisation can take to minimise the risks of a successful attack:

- Assessing the risks involved with having an Internet presence.

- Developing a site security policy and incident response plan.

- Providing adequate training and backup for key personnel.

- Ensuring that key personnel are kept up to date with security vulnerability information. E.g. by reading security related mailing lists.

- Registering with a body such as AUSCERT, the Australian Computer Emergency Response Team, which can provide invaluable help with incident response as well as detailed information on defeating known vulnerabilities.

One of the best resources for computer security related material on the Internet can be found at <http://www.cs.purdue.edu/coast/>. COAST is Computer Operations, Audit and Security Technology, a multiple project, multiple investigator laboratory in computer security research.

The O'Reilly & Associates books, 'Building Internet Firewalls' by Chapman & Zwicky and 'Practical UNIX and Internet Security' by Garfinkel & Spafford provide invaluable references to anyone involved in the computer security field. ♦

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## Modern Operating Systems Unleash Pentium Hardware's Power

*Rob Kolstad  
President of Berkeley Software Design, Inc.*

Too often, users install shiny new computer systems whose processors run twice as fast as their old systems only to find that their applications run just a bit faster than before. They install more RAM, more disk, more swap space yet still find marginal improvement.

Intel Pentium systems and the new Pentium Pro systems have incredible computing power that can be unleashed by modern operating systems. Clocking in at 100 and 200 MIPS respectively, users can harness these engines to deliver incredible performance for networking, file serving, and other applications.

Why do users so often observe less than dramatic speedups? Because their operating systems are not optimized for performance. The popular MicroSoft operating systems are optimized for backward compatibility, ease of new device addition, and for use by novices who make problems when they power down the computer while it is running, for instance. This eliminates certain strategies which can improve performance. Likewise, generic device drivers rob systems of their power. Backward compatibility adds overhead every time the system is used (for instance, for input/output or networking).

Alternatively, operating systems written in the style of UNIX provide astounding performance. Device drivers are optimized to achieve maximum throughput, disk operations are conserved by keeping often-used disk blocks in memory, and system services are streamlined to offer the best possible performance.

So what does 'written in the style of UNIX' imply? It means that:

- All vendors have an opportunity to create blazingly fast applications (unlike Windows systems where MicroSoft uses certain undocumented Windows NT features to speed their Web server).
- Users can purchase hardware at the level they need, without buying extra power they can never harness.
- Off-the-shelf PC's can fill roles normally reserved for their far more expensive workstation cousins.

By way of example, my company's BSD/OS operating system, when operating on a Pentium-Pro processor (200 MIPS), can serve web pages at the rate of over 43,000,000 per day! This hardware costs about A\$7,500. Of course, a web server running that fast requires a 45,000,000 bit/second line -- 30 times faster than the high speed T-1 lines that run at 1,540,000 bits/second (just under 200,000 bytes/second).

When operating on an off-the-shelf P5/133 processor, the BSDI-based server fulfills over 1,200,000 HTML requests per hour, over 28 million hits/day.

How do these systems deliver such incredible power? They implement the wisdom of 25 years of operating system development.

When a web page is used with any frequency at all, it is kept in high speed RAM. Likewise, disk blocks. Disk device drivers are written to squeeze every nanosecond out of the critical code that determines which block to read next. By saving revolutions of the disk and 'chaining' operations quickly, BSD/OS can run new high-speed disks at their full 5 MB/second capacity. That's 50 times faster than the mid-1980's when 0.1 MB/second was considered high-speed. Processors are also 50 times faster. This balance, when coupled with ever-growing and ever-cheaper RAM (4x cheaper than one year ago),

enable super-servers to be constructed from commodity-priced run-of-the-mill PCs.

Good software can make all the difference. Consider all the options before opting for expensive servers from workstation companies. High-end (but low cost) Pentium processors can beat all but the most expensive workstations at their own game. ❖

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## Name.Space vs DNS

*David Purdue*

On the 12th of November an Article entitled "Yes, we can all win the Internet Name Game" appeared on the front page of The Australian's Computers & High Technology Section.

The article lauded the achievements of one Paul Garrin, who has set up "Name.Space", an alternative implementation of the Internet Domain Name Service.

The Domain Name Service (DNS) is the mechanism used by the Internet to translate easy to remember names (e.g. www.auug.org.au) into hard to remember IP addresses (e.g. 203.10.76.35).

DNS functions as a distributed database, organised in a hierarchical fashion. At the top of the DNS hierarchy there are designated root servers. (In computing, roots are always at the top.) These root server delegate responsibility for top level domains (such as .com or .edu or .au) to other servers, and they in turn delegate responsibility for lower level domains to other servers.

Recently the DNS system has received some criticism, for two main reasons.

One is that it is getting increasingly difficult to register the name you want, especially in the .com or .com.au domains.

The other is that the government agencies and volunteers who used to administrate the top level domains have passed this responsibility over to private companies, who are charging for the maintenance of domain names.

Unless you an administrator at an ISP or the owner of one of these domain names the whole process is probably invisible to you.

What Mr Garrin has done is set up a new and separate Domain Name Service. This is easy enough to do - all you need is your own set of root level servers and enough people willing to recognise their authority to delegate parts of the DNS name space.

The Australian article claimed that this was a good thing, because Name.Space charge less for domain registration, and because they have replaced the boring InterNIC top level domains (like .com, .edu and .au) with racier and jucier ones like .zone, .cafe and .sex.

Mr Garrin encourages others to set up similar DNS name spaces in the spirit of competition and free enterprise.

I, however, would argue that a plethora of competing Domain Name Services is a bad thing - and my argument is based on the overriding principles of the Internet and indeed the principles of AUUG.

The Internet works only because those who connect to it agree to communicate with each other using a standard, well defined and published set of communication protocols, usually referred to as TCP/IP, and defined in the Internet RFC's.

AUUG is interested in and promotes the Internet because it is based on open standards.

One of the things we agree upon when we communicate is how to translate domain names into IP addresses. The Internet RFC's say that the authority to determine domain names lies ultimately with the Internet Assigned Numbers Authority (IANA).

Just as it is IANA's responsibility to ensure that every machine on the Internet is allocated a unique IP address, it is also ultimately their responsibility to ensure there are no clashes in the name space.

However if people go around setting up their own DNS systems, then this is impossible to enforce. The independent DNS's can only exist if users ignore IANA's authority to delegate domain names.

There are two ways competing DNS systems could operate - they could either be totally separate or they could exchange information about each other's name spaces.

If they are separate, then it could become nearly impossible to send e-mail. To receive e-mail you would need an address in each name space, so that my InterNIC address would be davidp@auug.org.au, my Name.Space address would be davidp@auug.user.group, while in Joe's Discount Names I am known as davidp@blah.cough.splutter (Joe's names aren't very good, which is why they are cheap). You don't know which name space the sender will be using to send you mail, and it is not always easy to change name spaces mid-stream. My business card will have to be a foot long!

If all the DNS's do exchange information, then it just shifts one of the problems with the existing DNS up a level. Instead of slugging it out for your favourite domain in .com, you will slug it out at the root level.

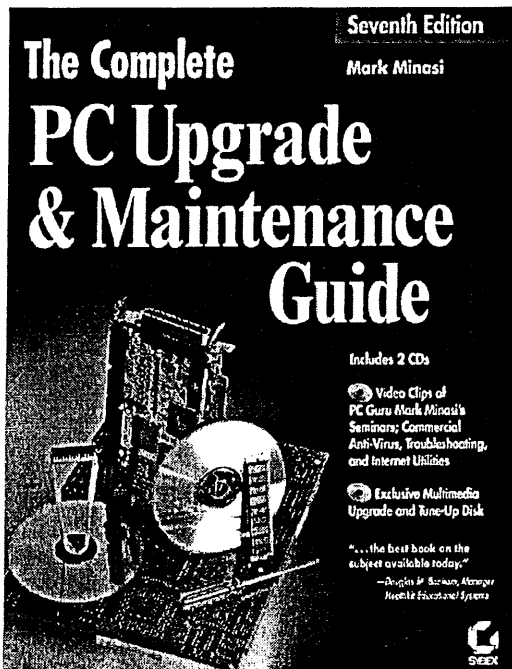
Remember that while you can register whatever name you like in Name.Space, your name will only be seen by those who agree to use Name.Space's root DNS servers rather than those designated by the IANA.

I do not claim that the current DNS system is perfect. It is experiencing problems that have been brought on by the changing nature of the Internet, and it will be some time before the Internet community can come to an agreement on the best way to solve these problems.

However I do not believe that setting up a plethora of competing domain name systems, however "free market" and "competitive" that may be, is the solution to the Internet's naming woes. ❖

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# New Products

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Software Intelligence is a leading Australian provider of enterprise-wide information security solutions for client/server computing environments. The OmniGuard suite of software products enables organisations to centrally manage information security policy across a wide variety of client/server platforms. In addition, OmniGuard provides enhanced data confidentiality, access control, user administration, and intrusion detection for PC,s, PC-LANs, UNIX, Windows NT, and mid-range systems.

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### OMNIGUARD: INTRUDER ALERT REAL-TIME MONITORING AND INTRUSION DETECTION

Now Available for Windows NT

Software Intelligence today announced the availability of AXENT Technologies, OmniGuard/Intruder Alert (ITA) version 2.3 for Windows NT. This release of ITA gives users the ability to monitor security-related events across UNIX, NetWare, and Windows NT and correlate those events to detect intruders, suspicious activity, or unauthorised uses of computing resources. ITA version 2.3 runs on Novell NetWare versions 3.x and 4.x, including NDS, Windows NT versions 3.51 and 4.0 platforms and most major UNIX operating systems including HP-UX, AIX, Digital UNIX, Solaris, SunOS, IRIX on Silicon Graphics, and NCR MPRAS. Also included in this release is a Windows-based GUI that runs on Windows 3.1, Windows 95 and Windows NT.

Today, most IT organisations have lots of audit logs, the problem is they don,t have enough people to review those logs. In addition, because these logs are produced by multiple servers running

multiple operating systems, it is difficult to correlate audit events across different platforms. Even if suspicious activity is discovered in the audit logs, it is often too late to do anything about it,% said Pete Privateer, AXENT,s senior vice president of product operations. AXENT is very excited about this release of ITA because it will enable security managers to easily detect and automatically respond to unauthorised activity in a multi-platform LAN environment.

As more and more corporations connect their networks to the Internet, the opportunity for internal abuse and external intrusions is increasing dramatically. In a recent US Department of Defense penetration test, attacks were mounted on 9,000 systems. Of those 9,000 attacks, 7,900 were successful and only 320 were detected. Of the 320 that were detected, only 15 systems responded to the attack. While Internet firewalls provide a perimeter defense against external intruders, firewalls are far from foolproof and, if the perimeter defense is breached, the internal systems behind the firewall are vulnerable. ITA adds another layer of defense that can detect suspicious activity and stop intruders before they can gain access to the internal systems.

Not all threats are from external sources. A recent study by the American Society for Industrial Security indicates that most security incidents are the result of abuse by insiders. Unfortunately, in today,s distributed computing environment it is quite possible for authorised users to do unauthorised things. ITA monitors all UNIX, NetWare, and Windows NT servers in the network for abuse and unauthorised activity. If abuse is detected, ITA can take automated actions including alerting the security administrator through the ITA console or by electronic mail or pager. ITA can take additional actions such as disable the user,s account, stop a program from running, block access to a system, or a wide range of other operations.

OmniGuard/ITA,s intrusion detection capability enables users to watch for real-time patterns of abuse across their entire enterprise via a powerful, rule-based engine that analyses a wide variety of data streams in each operating system as well as application audit trails, noted Robert Parker, product manager for Intruder Alert. ITA is designed to recognise internal or external threats to your network based on attack signatures known as policies. These policies can be constructed to monitor not only external attacks and probes, but can also be configured to watch for unauthorised



activity patterns, which are a bigger threat to a network. ❖

## **OMNIGUARD: UNIX PRIVILEGE MANAGER**

A new software product that provides control and partitioning of root privilege on UNIX systems

Software Intelligence announces the availability of OmniGuard/UNIX Privilege Manager (UPM), from AXENT Technologies, Inc. UPM will be the newest addition to the OmniGuard suite of enterprise security solutions. UPM will enable systems managers to regain control of root privilege on their UNIX systems. The new product is available for most major UNIX operating systems, including HP-UX, Sun Solaris, IBM AIX, Digital UNIX, and Silicon Graphics, IRIX.

### *Technical Specifications*

UPM solves a serious UNIX security problem which is caused when too many users are given privileged root access in order to perform routine job functions. When the root password is granted to a user for such routine activities as starting and stopping print queues or running backup jobs, that same user can have access to any file on the system, including sensitive salary, financial, or operational information. A user with root privilege can manipulate any system data area, set up unauthorized user accounts, or even take over operational control of the entire system. To reduce this security risk, UNIX shops must hire additional expensive UNIX systems administrators to perform routine operational activities.

OmniGuard/UNIX Privilege Manager (UPM) offers a way to address this problem with minimum impact on end users and UNIX systems administrators, without modifications to the UNIX operating system. With UPM, administrators can grant users the ability to run programs or commands that ordinarily require root access without giving the user full root privileges. Furthermore, the ability to run these commands can be restricted by machine, by location, and even by time of day.

"With UPM, we can now provide a UNIX systems manager with the ability to control authority and privilege levels at an acceptable cost, and with the critical auditability needed in a production environment", remarked James R. Bowerman, vice

president and general manager of the resource management business unit at AXENT.

In addition to root partitioning and control, UPM gives administrators the ability to audit who is running privileged UNIX commands. This ensures that the users who have the authority to affect system operations are using their authority in accordance with corporate goals and policies. Other users are prevented from taking actions which might disrupt the production systems or accessing sensitive data.

UPM works without requiring modification to the underlying operating system, which eliminates the reliability and support problems inherent in competing products that modify the UNIX kernel or replace native UNIX file access controls.

UPM supports OmniGuard's manager/agent architecture. UPM allows UNIX administrators to define privilege policy on one or more centrally located managers and ensure that this policy is enforced at multiple agent nodes. Multiple managers provide the ability to provide redundancy for high reliability, or alternatively allow partitioning of the network so that authority can be effectively delegated at the departmental level.

UPM is integrated with other OmniGuard modules including OmniGuard/Enterprise Access Control® for UNIX and OmniGuard/Intruder Alert® for UNIX. Using Intruder Alert, unauthorized actions can be detected and prevented. Enterprise Access Control for UNIX facilitates UNIX user administration and allows user profile information to be accessed by UPM for authentication purposes.

### *General Availability*

UPM is scheduled for general commercial availability on October 31, 1996, and is available directly from Software Intelligence.

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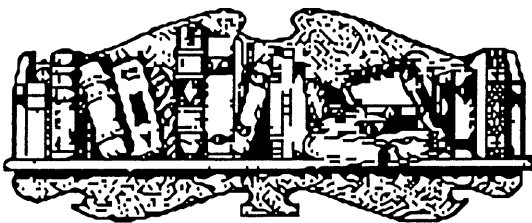
# Book Reviews

*Sub-editor: Frank Crawford*

Well, the Internet, the World-Wide-Web and Java are certainly big in the computing industry, as can be seen by the assortment of books we have this issue. We have reviews of books which range from how to program in Java, to how to create Java applets, onto VRML, and finally onto networks, the Internet and Firewalls. For those who don't care about the Internet, there is also a review of a book on LaTeX, a text formatting package.

I have to thank Danny Yee, who has offered a few of his reviews, without any coaxing. He has no connection with any of the publishers, but does reviews of a number of books, for everyone's benefits. His reviews can be read on the web from <http://www.anatomy.su.oz.au/danny/book-reviews/>.

As many of you have noticed, we currently have lots of books coming for review. The current practice is to post a note to the mailing list <auug-books@ansto.gov.au> and the newsgroup [aus.org.auug](mailto:aus.org.auug) when we have new books available. Unfortunately, this disadvantages members without network connections, or on the end of a low speed link. For people in such a position, either mail, via the AUUG PO Box, or fax me on (02) 9717 9273, with your contact details and preferences. ❖



## JAVA IN A NUTSHELL

by David Flanagan  
O'Reilly and Associates  
1996, 438 pages, \$29.95  
ISBN 1-56592-183-6

Reviewed by  
Peter Gray  
Information Technology Services  
University of Wollongong  
<pdg@uow.edu.au>

This book describes itself as a desktop reference for Java programmers. People thinking of buying this book should bear that in mind. This is not a book aimed at teaching you the Java language.

The book is divided into five sections. The first is titled "Introducing Java" and gives an introduction to the language aimed at the C or C++ programmer. This section only occupies about 80 pages and goes through a description of the language at a rapid pace. Although terse, the information presented is well laid out and quite easy to follow for people in the target audience.

Part 2 is entitled "Programming with the Java API" and introduces the reader to most of the packages needed to write Java applets. Topics covered include applets, GUI building, I/O, networking animation, and threads. The section is also around 80 pages in length. It includes large amounts of code as examples.

Part 3 is the "Java Language Reference". Here we find detailed information about the Java syntax presented in a straightforward and relatively compact manner. This section also includes a rather brief descriptions of events font and colour handling, and applet parameters. There is also a short but quite good summary of Java security features. The last few chapters in this section cover Java related HTML syntax and the Java Development Kit (version 1.0).

Part 4 is the Java API quick reference organised on a package by package basis. This reviewer did have one major complaint with this section. The description of the objects found in the JDK packages often lacked the detail needed for serious programming. It is no replacement for the JDK documentation. This may have been a deliberate choice on the part of the author to restrict the size of the book. It is easy to imagine a future series of

Java books with a complete volume devoted to each of the standard Java packages.

The final section of the book is a series of indexes. Some examples of the indexes provided are; a "class to package" index, a "method to class" index, an "implemented by" index for interfaces, and a "thrown by" index for exceptions. There are 7 indexes in all totaling 28 highly useful pages.

"Java in a NutShell" is based on version 1.0 of the Java API. The reader should be aware that subsequent releases of the API have contained minor changes from version 1.0

All in all this reviewer would say the book lives up to its promise of being a useful desktop reference.

❖

## ACTIVE JAVA: OBJECT-ORIENTED PROGRAMMING FOR THE WORLD WIDE WEB

by Adam Freeman and Darrel Ince  
Addison-Wesley  
1996, 235 pages, US\$25.95  
ISBN 0-201-40370-6

and

## EXPLORING JAVA

by Patrick Niemeyer and Joshua Peck  
O'Reilly & Associates  
1996, 407 pages  
ISBN 1-56592-184-4

*Reviewed by*  
Danny Yee  
<danny@cs.su.oz.au>

Somewhat bemused by the marketing frenzy and in no particular hurry to learn yet another programming language, I have refrained from asking for review copies of any books on Java. But a number turned up on my doorstep anyway and I found it hard to resist finding out what all the fuss was about.

The first book to arrive, and the only one I read right through, was *Active Java*. This is an introduction to Java aimed at those with basic programming competence but no experience with an object-oriented language. It works its way through the basics of the language, explains how to use the

awt and net libraries, then introduces the Java Development Kit and the basics of writing applets and applications. It concludes with a chapter on Java internals. The stress is on covering all the important ideas and concepts rather than on providing details. *Active Java* is an easily followed and clearly laid out volume which I recommend for anyone wanting a broad overview of Java: I think it would also make a good textbook for an undergraduate course, though it lacks exercises and is perhaps not repetitive enough.

As a supplement to *Active Java* and a source of more detailed information, I used *Exploring Java*. This begins with a brief look at internals and security issues and then launches straight into a basic "Hello Web!" applet. It contains detailed descriptions of the basic classes and standard libraries and is clearly aimed at experienced programmers who want to learn Java in order to write serious applications.

I have only glanced at the three other books on Java that turned up: *Java in a Nutshell* (O'Reilly) looks like a reference for the serious Java programmer; *On To Java* (Addison-Wesley) is a textbook with an unusual layout, using points/paragraphs numbered sequentially throughout; and *Learn Java on the Macintosh* (Addison-Wesley) comes with a Mac version of the Java Development Kit on CDROM. But anyone after a book on Java should look around carefully: as even this small sample illustrates, there are books on Java for all sorts of niche markets. I wouldn't be at all surprised to see titles like *From Common Lisp to Java for Amiga Users* and *101 Implementations of Tetris in Java* appearing! ❖

## CREATING COOL WEB APPLET WITH JAVA

by Paul J. Perry  
IDG Books Worldwide, Inc.  
1996, 360 pages + CD-ROM  
ISBN 1-56884-881-1

*Reviewed by*  
Lawrie Brown  
<Lawrie.Brown@adfa.oz.au>

This is another contribution to the ever growing pile of books jumping on the Java bandwagon. It does however have a more specific focus, namely introducing with the aid of many examples how to write some simple but useful Java applets for use in web pages, particularly by using existing objects and classes. Consequently, I think it is more

successful as a result. Although the book claims the only background needed is a familiarity with using DOS and Windows, I think you'd be struggling without some background in procedural programming languages, especially in C. The main focus of the book is a series of chapters illustrating by example how Java applets can be used for certain tasks.

In more detail the books contents are as follows:

Ch 1 is a brief introduction to the Internet, the Web, and to Java.

Ch 2 discusses how to use the Netscape Navigator web browser in particular.

Ch 3 provides a brief overview of the basic HTML constructs used to construct static web pages. Then it moves on to the main focus.

Ch 4 introduces Java, the concept of OO programming, all the basic language constructs, and the use of the Java Developers Kit (JDK). The book skates very quickly over the fundamental language constructs in this chapter, which would pose no problems for a competent programmer, but may cause difficulties otherwise.

Next come a series of chapters of applets by examples.

Ch 5 discusses how text and graphics can be displayed, in different fonts and colors, and the various graphic primitives.

Ch 6 looks at incorporating images and animations. The latter using a sequential display of a set of graphic images, via the Animator class (which is distributed as part of the JDK).

Ch 7 describes how sound clips can be loaded from AU files and played by applets, including a random play example.

Ch 8 discusses handling input events from the keyboard and mouse, including a very simple paint applet.

Ch 9 briefly documents all the demo classes provided with the JDK, which can be used as supplied, in web pages. It describes them, and itemises the parameters to each.

Ch 10 looks at network communications, at loading a new URL, accessing a file on the server, and briefly mentions the existence of sockets. It also

discusses the use of exceptions and exception handlers.

Ch 11 describes the AWT GUI toolkit which is currently provided for Java applets. It describes the types of controls available, briefly discusses the various geometry managers used to layout the controls, how controls are added, how events generated by them are handled, and how the browser status line can be modified.

Finally Ch 12 continues the development of user interfaces by discussing how to create separate windows, dialog boxes, and menu bars.

The book ends with several reference appendices.

The book comes with an associated CDROM. This contains the source for all the examples in the book, as well as a copy of the JDK for Win95 or WinNT, and a copy of an issue of the JavaWorld magazine. The files on the CDROM use standard 8.3 DOS names, however batch files are provided to expand them to the long names actually used. A major flaw is the fact that the expanded long names are all lowercase when the the HTML and Java source files assume mixed case names. Consequently on a case-sensitive file system such as Unix, nothing worked when first unpacked. Particularly when the author actually warned about the need for care with filenames several times in the text, this was quite annoying. Its a times like these that the underlying PC focus becomes apparent, though the vast majority of the book would be applicable on most platforms.

The major strength of this book are its numerous examples illustrating the techniques being discussed. Mostly these relate well to the associated chapter content. I would have liked to have seen some suggested exercises though, to encourage the reader to try some of the techniques out. As it is, you're left very much on your own in deciding what to try, and where to go next.

In conclusion, I think this book make a reasonable attempt at satisfying its goal, illustrating by example how to use Java to enhance web pages. It is certainly not a comprehensive reference, and I think you do need some programming background to make the most of it, but its worth considering if your interest is primarily in writing simple applets for your web pages. ❖

# VRML: BROWSING AND BUILDING CYBERSPACE

by Mark Pesce  
New Riders Publishing  
1995, 424 Pages  
ISBN 1-56205-498-8

*Reviewed by*  
Kirk Barrett  
BHP Information Technology  
<barrett.kirk.kh@bhp.com.au>

I offered to review this book as someone who has been working with Web technology for a couple of years but had very little background in VRML (pronounced 'vermal'). In fact until I began reading the book I had not even browsed a VRML world.

The book was written by one of the founders of the VRML language, Mark Pesce, and contains a wealth of information for those wishing to get started in Virtual reality on the web or Cyberspace as it has become known. The "Road Map to VRML" at the start of the book indicates that the target audience is anyone "from the novice Web user to an accomplished programmer". To facilitate this Mark Pesce has suggested three possible paths through the book, the 'novice' path, the 'hackers' path and the 'designers' path. The 'novice' path is aimed at the reader who is not familiar with the web or VRML a includes the chapters that cover an introduction to the web, VRML browsers, VRML tools. It provides a good introduction for those readers that want to get up and running quickly but to be honest it wouldn't be worth buying the book if this was all you were interested in.

The 'hackers' path is aimed at the reader with experience with the web and a knowledge of 3d graphics and who is interested in getting into cutting VRML code as soon as possible. It runs through the chapters that comprise the books VRML Primer and those that cover important technical publishing issues as well as a look at impending future developments with VRML. This path also covers server scripting for VRML using Perl and a high level chapter on how to write a VRML browser..The designers path is aimed at those readers who are designing their own VRML site and includes all chapter except those in the VRML primer and the chapter writing your own VRML browser. As you can imagine this path is probably most useful if you are planning a VRML site but not going to be getting your hands dirty with VRML coding.

The book is divided into five parts each containing a number of chapters.

Chapters 1 to 4 make up Part 1 which is titled "Colonizing Cyberspace". Chapters 1 and 2 provide an overview and background of the development of electronic communications and the Web as well as a brief history of VRML. Chapter 3 gives a short description of how VRML works and how it fits into the Web. Chapter 4 covers Web browsers with detailed examples based on demonstration copies of browsers provided on the book's companion CD. Ample screen snapshots are provided but the b/w pictures are very dark and fail to assist the reader in any great way. I felt greater benefit was gained by reading this chapter while using the browsers.

Chapters 5 through 8 make up Part 2 entitled "The Complete VRML Primer". Chapter 5 contains a 3d graphics primer written for the novice reader or one who wished to refresh their knowledge on this topic. There is little technical detail but it does provide an easy to read introduction to "the basic components of three-dimensional graphics and how we use a computer to create realistic images.". Chapters 6,7 and 8 provide a complete primer on VRML 1.0 at the end of which you should be able to develop your own VRML worlds. An example is built up through these chapters that starts with a simple yellow sphere and ends with a complete heliocentric clock that enables you to view in 3d the position of the Sun, Earth and Moon at any point in time. The complete code for this including Perl scripts is included on the companion CD.

Part 3 only contains a single chapter covering VRML style guidelines and a couple of the VRML world building tools included on the companion CD. A walkthrough of the VRML building tools is provided enabling the reader to build a simple 3d room with windows and a door, play with texture mapping and create hyperlinks from 3d objects other VRML worlds or web pages.

Chapters 10 through to 13 make up Part 4 entitled "The Road to Know Where". Chapter 10 covers VRML optimization an publishing issues like level of detail and inline inclusion of VRML objects from other servers. Chapter 11 provides a high level description of what is required to write a VRML browser. Chapter 12 details the thoughts of the author and three other major players in the VRML arena on style and design issues for cyberspace. This chapter made for a very interesting read and many of the concepts covered also have direct application in the design of Web sites. Chapter 13 wraps up the book with a look into the future for

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VRML talking about immediate enhancements that were planned at the time the book was published as well as many long term plans from VRML 2.0. Around mid August this year it was announced that the basic standard for VRML 2.0 was agreed to at SIGGRAPH'96 with some of the sticking points like 3d Avatars left to be resolved separately.

The 3 appendices at the end of the book contain a complete specification for VRML 1.0, an extremely useful list of VRML resources and a full description of the contents of the companion CD that comes with the book.

Overall the book was interesting and easy to read. I did not follow any of the suggested reading paths electing instead to read through it sequentially. By the end of the book I was able to fairly easily put together a simple world containing a giant 3d version of my business card, a transparent GIF image texture mapped onto a sphere hyperlinked to my personal home page and some 3d text floating at various places. One point to note thought is that with the recent release of the VRML 2.0 standard I would expect that an updated version of this book will be re-released in the near future. ❖

## **A GUIDE TO LATEX 2E: DOCUMENT PREPARATION FOR BEGINNERS AND ADVANCED USERS**

by Helmut Kopka and Patrick W Daly,  
Addison-Wesley  
1995, 554 pages, \$49.95  
ISBN 0-201-42777-x

*Reviewed by*  
*Jagoda Crawford*  
*Australian Nuclear Science and Technology Organization*  
*<jc@ansto.gov.au>*

This guide is based on Helmut Kopka's German book on LaTeX, and according to the preface was inspired by the number of requests for an English translation. This second edition presents both the classical version (designated 2.09) and the now official standard, named LaTeX 2e.

For those who are not familiar with TeX, it is a text formatting package (similar in concept to troff) designed by Donald E Knuth for the formatting of scientific and technical documents/books. LaTeX is a macro package designed for use with TeX. It has been widely accepted in the scientific community, with many scientific journals and conferences now

requesting that contributions be submitted in LaTeX format.

The book is purely aimed at the users of LaTeX, and requires little experience with computers. It does not cover in any depth the installation and configuration. For those interested in installation the O'Reilly book, *Making TeX Work*, by Norman Walsh, is a good reference. Kopka and Daly explain the basic elements of the standard distribution of LaTeX, giving examples and exercises.

The authors start by giving an overview of text formatting and TeX, then on to LaTeX and finally leading to LaTeX2e. After presenting such things as environments and special characters, document layout is presented. It describes how to set up the page style and the various parts of the document e.g. title page, abstract, various sections, appendices, table of contents etc. This, I found a very useful section as it sets the scene for document formatting.

The introductory section is then followed by a chapter on the different ways of displaying text, covering such topics as changing fonts and font sizes, underlining, centering, indenting, lists, tables, boxes etc. A chapter on each of the following is also provided:

- formatting of mathematical formulas,
- pictures, building blocks from which pictures are constructed, text, straight lines of various inclinations, arrows, circles and ovals,
- defining user commands,
- advanced features - subjects included here are the splitting of a document into several files, selective processing of parts of a document, cross-references to sections, figures and equations, automated production of bibliographies, indices and glossaries, handling different sets of fonts and preparing presentation materials (slides).
- basic structure of error messages, some sample errors and a list of error messages with a description of possible causes and solutions.

A number of appendices are also included covering such subjects as the formatting of correspondence, creating bibliographic databases and using them in documents, programming LaTeX extensions and a list of commands.

The material covered by the book is well presented and I believe that this book is a must for newcomers to LaTeX as well as for use by more experienced users. It provides a thorough listing of all the basic concepts and reference for key ideas. ❖

## ZEN AND THE ART OF THE INTERNET (4TH ED).

by Brendan P. Kehoe  
Prentice Hall  
1996, 255 pages  
ISBN 0-13-452914-6

*Reviewed by*  
Jon Wright  
Guru Software Services  
<job@UNS.com.au>

*Zen and the Art of the Internet* is a relatively well known book. It is often referenced in on-line conversations, particularly in Usenet news groups. Having heard so often about it's wonderful qualities and also being somewhat interested in the strange concept of combining Zen and the Internet, made the chance to review this book almost irresistible. Unfortunately, as often happens in life, the actual book was initially a big disappointment. Apart from the mention of the fact that the author was inspired by two books: *Zen and the art of Motorcycle Maintenance* & *Zen and the Art of Archery*, and a brief definition of Zen on page 229, there appears to be no particularly good reason for even having the word Zen in the title. To make things worse, trying to use the index for cross-reference purposes was almost impossible (some of the page numbers are wrong).

At this stage, the book was almost returned unreviewed until the idea of fairness began to surface. The book had been disappointing because of expectations built up over a long period of time. It would be more appropriate to try and view the book as if it was totally unknown. From this perspective, *Zen and the Art of the Internet* is yet another internet introduction. The difference probably comes from the easy flowing style and succinct coverage of the major topics. The book quickly introduces the major subsections of the net, (mail, ftp, news, www) and then covers the various tools and commercial providers before moving on to the most interesting chapter which provides background information for newcomers to the net (e.g. the internet coke machine, the worm, etc.). The book is then completed with a series of specific indexes, including one on creating home pages. Naturally the commercial provider section is US-

centric like most books published in the US, to replace this section try another book like *OzInternet* (Goodheart & Crawford).

After this section read of the book, the reason for Zen in the title began to appear. Zen Buddhists believe that enlightenment can arise from intuition rather than from the study of scripture or history. In the same way, this book is trying to provide make the internet more intuitive for newcomers.

The final question is how this book stacks up against the competition? Basically the only other comprehensive quality introduction that covers similar ground is probably the O'Reilly *Whole Internet Guide*. Zen is probably an easier introduction and it is also a lot easier to carry around. That means it is probably the best background internet book for newcomers. ❖

## COMPUTER NETWORKS: A SYSTEMS APPROACH

by Larry L. Peterson and Bruce S. Davie  
Morgan Kaufmann  
1996, 552 pages, US\$69.95  
ISBN 1-55860-368-9

*Reviewed by*  
Danny Yee  
<danny@cs.su.oz.au>

In many ways *Computer Networks: A Systems Approach* contains just what one would expect to find in a serious introduction to networking. Peterson and Davie begin with a quick introduction to basic networking concepts, then look at abstract protocol implementation in the context of the *x*-kernel system (fragments of code from which are used throughout to illustrate implementation issues). They very broadly follow the standard network layers upwards, with chapters on host and link issues (ethernets and token-rings, encoding, framing, and error detection); on packet switching and routing; on bridges, internetworking, IP and IPv6, DNS, and multicast; on end-to-end protocols (UDP, TCP, RPC, and performance issues); and on end-to-end data (presentation, encryption, compression). Chapters on congestion control (especially in TCP implementations) and high-speed networking (including real-time services and quality of service guarantees) complete the volume.

Each chapter begins by describing one central problem that motivates it, and ends with a discussion of an "open question" -- the relationship between IP and ATM, for example, or the balance



between handling congestion control inside and outside networks. The effect is to convey a feel for networking as a dynamic and evolving field. Side boxes contain digressions, a device which works quite well here.

It's hard to put my finger on exactly what sets Peterson and Davie's offering apart from the many other introductions to networking available. The depth of their coverage, certainly, and also their good coverage of implementation and architecture issues. But the key to their success is what they call a "systems approach", a concentration on first principles and basic building blocks and concepts. So there are no lengthy descriptions of protocols for their own sake -- they are used instead to illustrate fundamental ideas. (Protocols are, after all, merely solutions to problems.) If the focus is very much on the Internet and internet protocols, that is because they are the only systems which address some problems.

*A Systems Approach* really does manage to highlight the most important ideas. It is also an attractive and clearly laid out volume and, despite the price, one which is good value for money. It is easily the best general networking textbook I have seen. Though it may daunt weaker students, it would be suitable as a text for higher undergraduate courses; it is the first book I would recommend to computing professionals approaching networking for the first time or seeking to refresh their knowledge of the field. ♦

## INTERNET FIREWALLS AND NETWORK SECURITY

by Karanjit Siyan and Chris Hare  
New Riders Publishing  
1995, 410 pages.  
ISBN 1-56205-437-6

*Reviewed by*  
*Craig Macbride*  
*<craig@rmit.edu.au>*

I'm glad to say that this was one of the most readable technical books I've encountered in quite some time. Many books on highly technical matters fall into several traps, particularly of not providing background information or of not providing good examples. Too often, reference works provide examples for only one Unix variant, leaving users of other variants wondering. *Internet Firewalls and Network Security* provides copious background material and the examples are aimed broadly at Sys V or BSD machines with specific

notes on SunOS and SCO Unix at various points. From there, it should be possible for network administrators to make sense of this book in most Unix environments.

The book starts with a detailed section on TCP/IP, particularly the parts relevant to low-level setup and security, subnets, .rhosts files, the daemons and so on. Next it goes into the Unix security side as it related to networking, the meanings of the US "Orange Book" levels, password controls, NFS, encryption and Kerberos. The background section ends with an in-depth discussion of network security planning and policies and includes reference to worthwhile news groups and mailing lists on Usenet.

The second part is where it gets interesting, starting by covering screening routers and packet filtering. The authors cover in some detail how to work out packet filtering rules for your security requirements, the problems involved with packet filtering with FTP, and some case-study examples for different filter setups. Cisco routers are covered in particular, as regards the syntax for setting up filter rules.

They go on to cover firewall architecture and implementation, using TCP Wrapper, FireWall-1 for Suns, ANS Interlock for Suns and IBM AIX machines, TIS Gauntlet which runs on a specially modified BSD Unix kernel on an Intel box, and finally the free TIS Firewall Toolkit.

One thing that did surprise me was that the figures referring to packet dumps use LANalyzer for Windows, rather than using a familiar Unix tool, such as tcpdump. Given that the whole of the rest of the book is devoted to Unix variants, except where PC packet filter software is covered, the use of an MSDOS machine sitting on the network to monitor traffic is a little surprising.

It also surprised me that some typos had crept into diagrams, but the reader who doesn't spot those probably shouldn't be trying to set up a firewall anyhow.

If you are looking for information on TCP/IP networking and how to make it secure when connecting to the outside world, this seems like a good reference source. It takes a methodical approach to the whole problem, from working out your security requirements to implementing them with a router doing packet-filtering and/or a bastion host.

# LIONS' COMMENTARY ON UNIX 6TH EDITION WITH SOURCE CODE

by John Lions

*Reviewed by  
Lucy Chubb*

My acquaintance with the original orange and red (well, it fades to pink) covered books that were the version 6 source code and commentary began in 1981 when I did John Lion's operating systems course. I both loved it and had a mild dislike of it -- a dislike arose because it drove me to work (OK, I'm lazy), and love because it opened the world of operating systems to me, one that has delighted me ever since. Later, while doing a port of version 7 UNIX (what else!?) and rewriting its memory management for a masters degree, I tutored from those same books and even had the privilege of giving some lectures for John while he was away for a number of weeks. During those years my copy has suffered from having naive undergraduate notes written into it, rubbed out and repeatedly replaced by other penciled notes as my understanding grew.

This book contains the two original "Lions' books" (the first being a source code listing of UNIX level 6, complete with the original warning against disclosure, and a separate commentary), various notes, forwards, and appreciations by Dennis Ritchie, Ken Thompson, Micheal Tilson, Peter Salus, Mike O'Dell, Greg Rose, Berny Goodheart, Peter Collinson, and Peter Reintjes.

The line numbered source code listing contains the kernel routines with the exception of device drivers, where only a few example ones are given. The commentary includes information about the PDP11, which is necessary for understanding some parts of the code, and an explanation of the different subsystems such as process management which which gives an overview but goes down to a line by line commentary where appropriate. The last chapter gives exercises for those who want to think further about the code.

Ken Thompson and Dennis Ritchie published a paper "The Unix Time-Sharing System" in May 1974 in the Communications of the ACM. After fellow lecturer Ken Robinson wrote away to get the new operating system, John Lions decided to base his Operating Systems course around reading the source code. In 1977 he completed his commentary to accompany it.

The UNIX source code turned out to be a good choice for study; it was both small and elegant and the Lions commentary made an excellent companion. Michael Tilson writes in his prefatory notes "The UNIX operating system kernel code was itself an elegant work, and even today it remains worthy of study. John added a line-by-line analysis that was equally elegant." ... "It is part of our technical history, and we can still learn from it today." It was so much appreciated by the growing UNIX community that they were often photocopied in spite of restrictions on their distribution. As Ken Thompson says in the forward, "finally -- one of the most widely distributed underground computer science documents is freely available." And Dennis Ritchie, "The document reproduced here educated a generation. It's notoriously one of the most-copied manuscripts of computerdom, and it's good to have it in the open record".

While UNIX has grown massively in size and complexity in the intervening years, reading the version 6 source code gave me a foundation that is still firm. One of the things that I really appreciated is that the version 6 source code is small enough to be understood as a whole (although that takes some work) but at the same time is a real operating system that could (and was) used for real applications. As chapter one of the Commentary says "it is accessible in a way that most other systems are not: the amount of material which must be mastered in order to gain a reasonably deep understanding of the system is not impossibly large. By way of comparison, OS/360 and its successors are far too complex to be completely understood by any one individual."

Whether it's to replace your many generationed photocopy or just to find out what it's all about, have a look at this book. The operating systems concepts are still valid today, and even the skeleton of UNIX version 6 still bears some relationship with modern versions. If you wish to go further than this, Warren Toomey recently posted that SCO has issued free binary licenses for this version (in which case this book would be a great companion to the binary). Details of how to get it and several simulators which can run it can be found at <http://minnie.cs.adfa.oz.au/PUPS/> (where PUPS stands for "PDP Unix Preservation Society"). ❖

# Lions' Commentary on UNIX® 6th Edition, with Source Code

John Lions

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ISBN 1-57398-013-7



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reproduced without modification, is really two works in one:

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- ⊕ a brilliant commentary on that code by John Lions.

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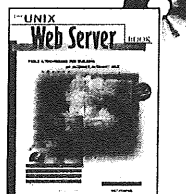


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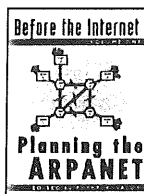
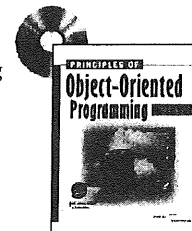


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## AUUG News: Canberra

### CALL FOR PRESENTATIONS AND WORKSHOPS

John Wright  
johnw@canb.auug.org.au  
Canberra AUUG Summer Conference Programme Chair

AUUG in Canberra is holding its 8th annual conference and workshops on the 12th, 13th and 14th of February 1997. There will be two days of workshops, followed by the one day conference. The venue will again be the Australian National University.

As well as national speakers, we are looking for presentations from local individuals and organisations in any area of UNIX, Open Systems or Networking. Presenters for half or full day workshops on any subject are also welcome (workshop presenters receive a modest honorarium).

Any organisations interested in sponsoring the conference and/or workshop are most welcome. The conference and workshops always attract a good attendance, with over 100 people from throughout the Canberra region attending the 1996 conference and workshops.

We look forward to hearing from you with your ideas for the 1997 conference and workshops.

For further details, please contact:

Programme Chair:

John Wright  
jwright@nla.gov.au

Workshop Organiser:

David Baldwin  
David.Baldwin@anu.edu.au

Some additional notes for AUUG Chapter contacts (hopefully to persuade at least one or two of you to present a paper and/or workshop) ...

- Workshop presenters receive an ex gratia payment of \$200 for each half-day workshop they present.

- Those presenting a paper at the conference will receive free conference registration (so what's new :-)?).

- We will pay for your return airfare to Canberra. You'll be billeted with a local AUUG member during your stay.

So what are you waiting for? We're open to ideas, so if you have any favourite topic you'd like to talk about, or if you have a burning desire to hear a paper or workshop presented on a particular Unix/Open Systems/Networking issue, get in touch with the Canberra AUUG Committee at [cauug.committee@canb.auug.org.au](mailto:cauug.committee@canb.auug.org.au).

All suggestions and contributions greatly appreciated. ❖

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## AUUG News: Darwin

Malcolm Caldwell

The Darwin Chapter of AUUG hosted a one-on-one debate on the theme *A variation of the gun debate: "Computers don't kill people, people kill people."*

The protagonists were Dr. Perry Morrison, Consultant and former lecturer, and Mr Phil Maker, Lecturer in IT at NTU, and a former pacemaker software developer for Telectronics.

Phil lead off with the "yes" case, after a short interval of confusion in which moderator, and local AUUG president, Alan Cowie assisted all parties to work out who was "yes" and who was "no" (tricky things debate titles!).

Phil ran a "straw man" line, first articulating the likely opposition logic then demolishing it. STRAW MAN: "Software is unreliable... Unreliable things kill people... Killing people is bad... Therefore never use software in life critical situations." MAKER: This is the wrong kind of logic. Probability is the correct approach. Phil gave an example from his own experience in designing software for use in heart defibrillators. If the chances of dying without the defibrillator are 50% then even a 5% improvement using risk prone software is worth it.

Perry, unkindly, took a different, rather whimsical, tack...relying for the "no" case on examples of what he termed Folk Sense.

He put forward three separate "lifelike" hypotheticals involving bulldozers, video remote controls, lawnmowers, and strawberry jam (or was it raspberry?) which illustrated the common sense impulse to blame the machines themselves for shortcomings.

The formal debate served its purpose of stimulating a floor discussion on his central theme, system complexity and the limits it places upon our capacity to control system behaviour. This a major issue with digital systems because complex systems with "an untestable number of system states" can be easily built.

A number of reasonably well known cases were briefly discussed; the Airbus and X31 incidents; Space Shuttle reliability (It was not Challenger's computers which failed, but an O-ring failure). Perry raised the issue of possible software errors in Blackhawk fly-by-wire helicopters, a logical line of discussion after the recent Queensland disaster. It was only after the debate whilst researching some of his old material that I discovered he has been raising concerns about Blackhawks since the late 1980's..... Very interesting.

The discussion continued apace at the post debate pizza session. Our thanks to the two debaters for a spirited and thought provoking evening.

Phil Maker has placed a special Web page on the debate at:  
<http://www.cs.ntu.edu.au/staff/pjm/auug-debate/homepage.html>

In addition to his own thoughts he has included links to other places. Having followed some of these links I would recommend the following articles on Perry Morrison's work:

<http://catless.ncl.ac.uk/Risks/9.15.html#subj4>  
You will find here a synopsis of a paper co-authored by Perry Morrison and Tom Forester entitled "Computer Ethics: Cautionary Tales and Ethical Dilemmas in Computing". Its publication seems to have been something of 'cause celebre' at the time.

<http://catless.ncl.ac.uk/Risks/10.40.html>  
Included here is a reflection by Perry Morrison on the discussion raised by the publication of the above paper (and some follow through in the popular press). The views of one Phil Maker of the NTU are singled out for particular comment; in fact

they seem to have caused Dr Morrison to modify his original tough views. ❖

---

## AUUG News: NSW Chapter

*Wayne Bell*  
[wayneb@sydney.dialix](mailto:wayneb@sydney.dialix)

NSW Chapter has monthly meetings on the third thursday of each month upstairs at the Occidental Hotel, York St, Wynyard

The October meeting featured a talk on Unix to non-Unix connectivity by Frank Crawford and Ian Crackenthorp. The discussion covered a wide range of connectivity tools, especially SAMBA and netatalk. Frank and Ian talked about their experiences with connectivity tools and invited comments and discussion from the floor on our experiences.

The November meeting Dr Bruce Howarth, a senior lecturer at the University of Technology, Sydney, gave an entertaining and informative talk about SGML - the Standardised General Markup Language.

The talk was prompted by a comment one company manager made to Bruce, "I don't employ computer science graduates because they know nothing about text." It transpired that by text he meant SGML and related ISO standards for document presentation.

Bruce gave an overview of the history of SGML, and a feel for the flavour of the tagged text syntax used in SGML. He stressed its importance in current computing, mainly because of HTML, which is an SGML DTD (Document Type Description).

Bruce concluded with the question, "Should a course on SGML be included in the UTS computer science degree?" This sparked a lively debate among the attendees (approximately 30 AUUG and SAGE-AU members attended). One overriding conclusion was that computer science students needed to learn to write, but that learning about the structure of documents (which is reflected in SGML) could turn them in to better writers.

## SUMMER CONFERENCE

AUUG NSW will be holding our Summer Technical Conference on the 20th and 21st of February, at Charles Sturt University, Bathurst.

We will have a day of tutorials on the 20th, and the conference proper on Friday the 21st. We hope to have an international speaker for the conference. AUUG NSW have arranged 32 student rooms, for accomodation on a first come first served basis. These rooms are cheaper than motel/hotel accomodation so book early.

More information including registration forms will be coming to you shortly.

## CONTACTS

Wayne Bell  
Chair  
wayneb@sydney.dialix.oz.au

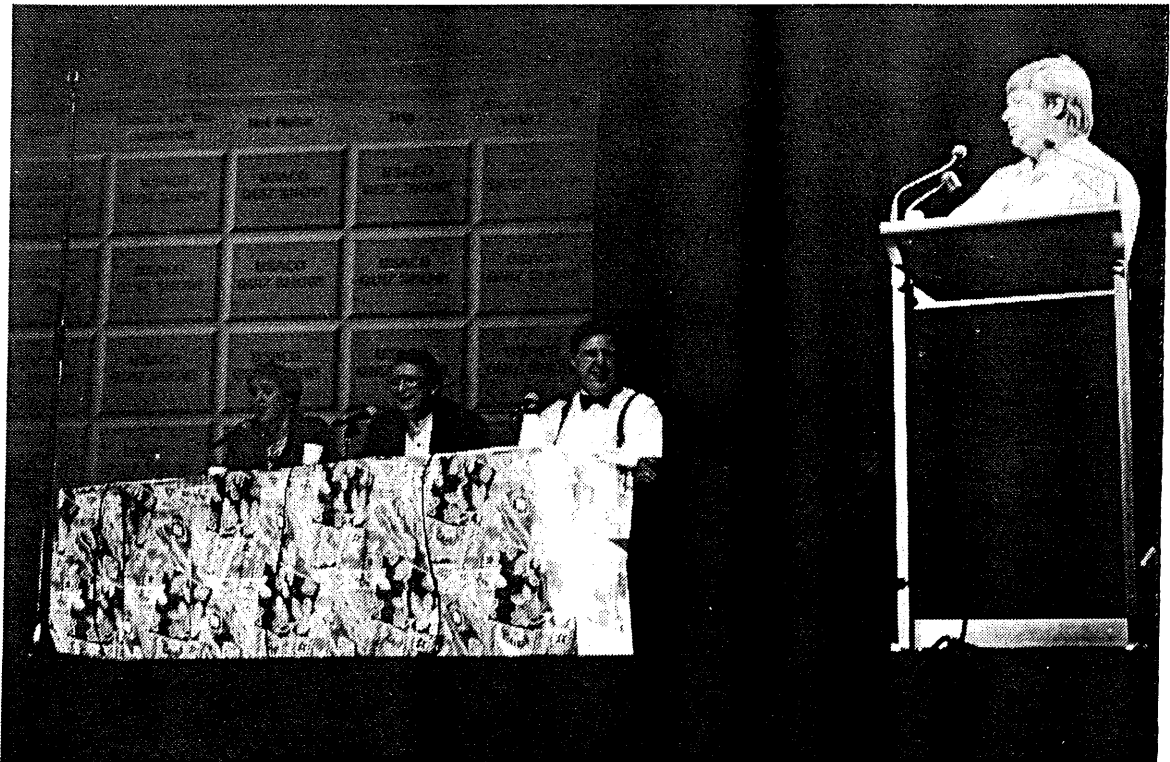
David Purdue  
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Images from AUUG '96:

It's JEOPARDY!! With your host Rob Kalstad,  
and contestants Joan McGilliard, Rolf Jester (Digital)  
and our own David Purdue (AUUG Secretary).

❖



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# Images from the Chapter Council Meeting

The Chapter Council Meeting was held in Sydney, on Saturday December 6th, 1996. A successful meeting, with many ideas and views exchanged between the representatives.

[ Of course, the real story is they were all there receiving counselling .. ;-) - Ed. ]



(L to R) Someone's knee, Someone else's knee, the back of a chair, Malcolm Caldwell (NT), Stephen Boucher (AUUG Treasurer), Lucy Chubb (AUUG Vice President), Wayne Bell (NSW), Mark White (Qld), Patrick Ko (WA), John Terpstra (NSW)

(L to R) David Purdue (AUUG Exec + NSW), Michael Paddon (AUUG President), Alan Cowie (NT), James Patterson (Tas), Enno Davids (Vic)



---

# UNIX Tricks & Traps

*Sub-editor: Günther Feuereisen <gunther@ibm.net>*

It's been a busy month, having taken over the helm of AUUGN, I haven't had a chance to write any Tricks & Traps this time around. Fortunately Peter Turnbull dropped me a note with some more ideas about the tar(1) command.

As it is that time again, and as this is the Christmas issue, I thought we might get into the holiday spirit by looking at some UNIX Christmas humour.

To all those who dropped me a note - thank you! It's nice to know someone's checking up on me :-). Keep those contributions coming in!

Happy Holidays! ❖

[ Last issue we looked at the tar(1) command and useful ways in which it could be used. Here, Peter Turnbull highlights some other ways of using the tar(1) command. - Ed ]

## TAR - THE STORY CONTINUES

*Peter Turnbull <petert@daedalus.com.au>*

Using 'rsh', 'rcp' and 'tar' to copy files and directories to remote systems can be an easy one liner. But when those remote systems are on a slow WAN (ie: <10MB), the time it takes to copy the files can become more critical. Here in order from slowest to fastest are the commands to copy files to a remote system. (Note, that order assumes you are transferring a reasonable large amount of data)

### Method 1

```
$ tar cvf /tmp/files.tar /var/somefiles
$ rcp -p /tmp/files.tar otherside:/tmp/files.tar
$ rsh otherside "tar xvf /tmp/files.tar"
```

### Method 2

```
$ tar cf - /var/somefiles|rsh otherside "tar xvf -"
```

### Method 3

```
$ tar cvf /tmp/files.tar /var/somefiles
$ gzip /tmp/files.tar
$ rcp -p /tmp/files.tar.gz otherside:/tmp/files.tar.gz
$ rsh otherside "gzip -d /tmp/files.tar.gz"
$ rsh otherside "tar xvf /tmp/files.tar"
```



#### Method 4

```
$ tar cvf /tmp/files.tar /var/somefiles
$ gzip /tmp/files.tar
$ rcp -p /tmp/files.tar.gz otherside:/tmp/files.tar.gz
$ rsh otherside "gzip -dc /tmp/files.tar.gz|tar xvf -"
```

#### Method 5

```
$ tar cf - /var/somefiles|gzip -c|rsh otherside "gzip -dc|tar xvf -"
```

❖

## **SANTA CLAUS IS COMING TO TOWN** in C-shell

*Author Unknown*

[sing]

```
better !pout !cry
better watchout
telnet why
santa claus <north pole >town

cat/etc/passwd >list
ncheck list
ncheck list
cat list | grep naughty > no_gift_list
cat list | grep nice > gift_list
santa claus <north pole >town

who | grep sleeping
who | awake
who | egrep 'bad|good'
for ( goodness sake) {
    be good
}
```

❖

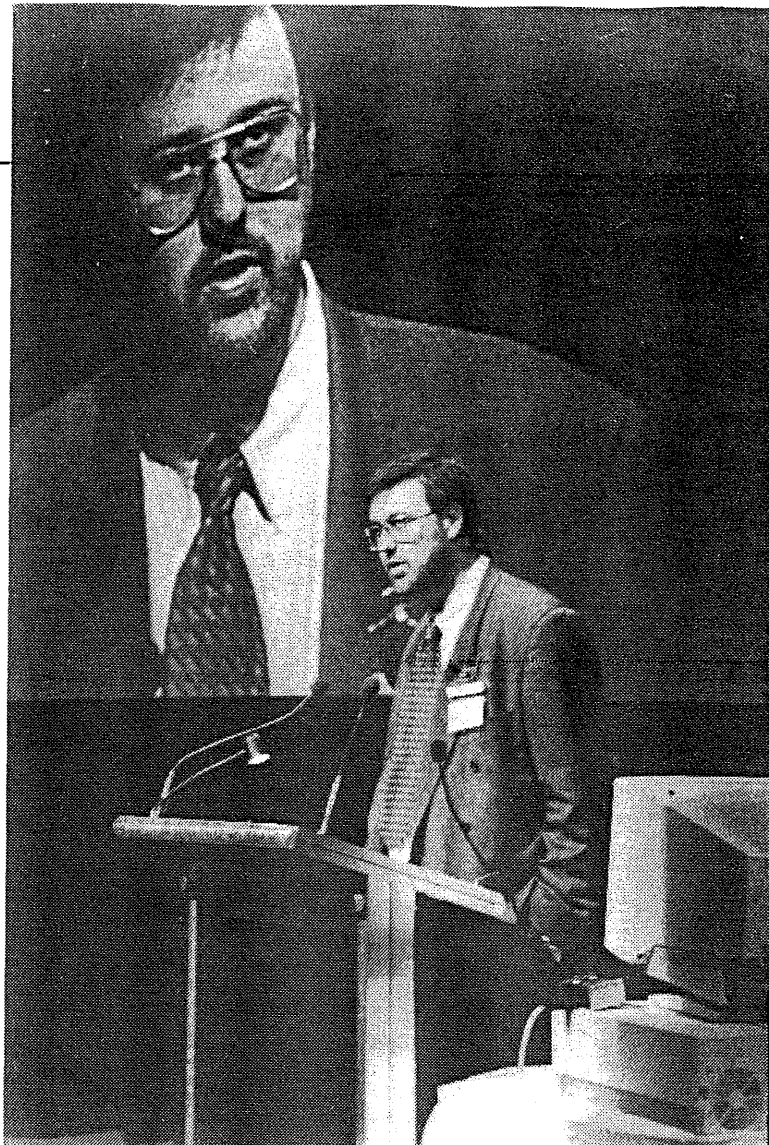
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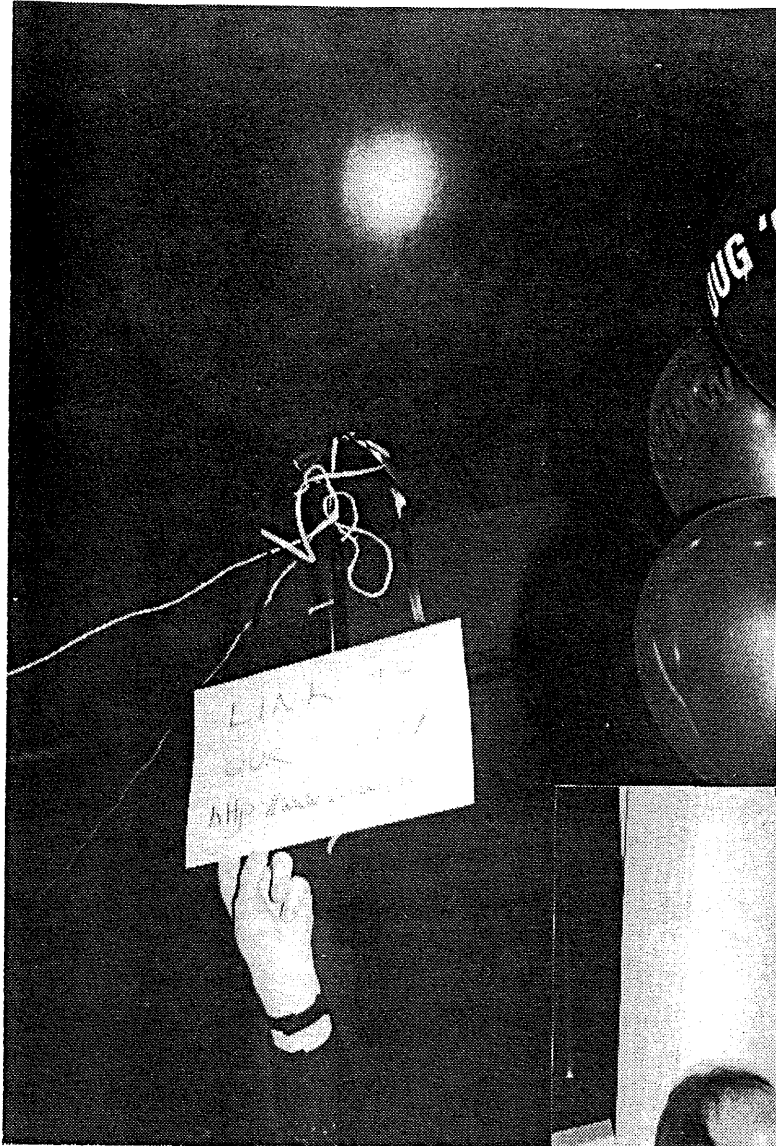
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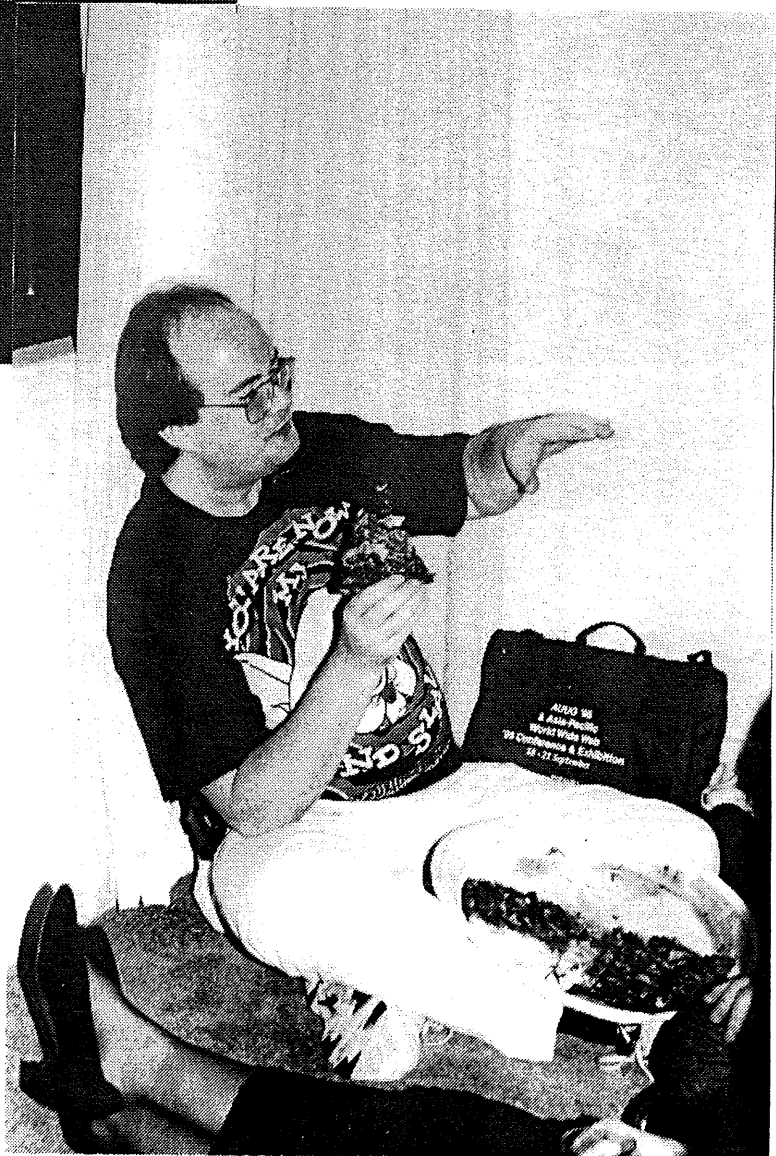
El Presidenté (Michael Paddon)

The Secretariat's Wael Foda, and a subtle  
reminder as to who is providing the \$\$.

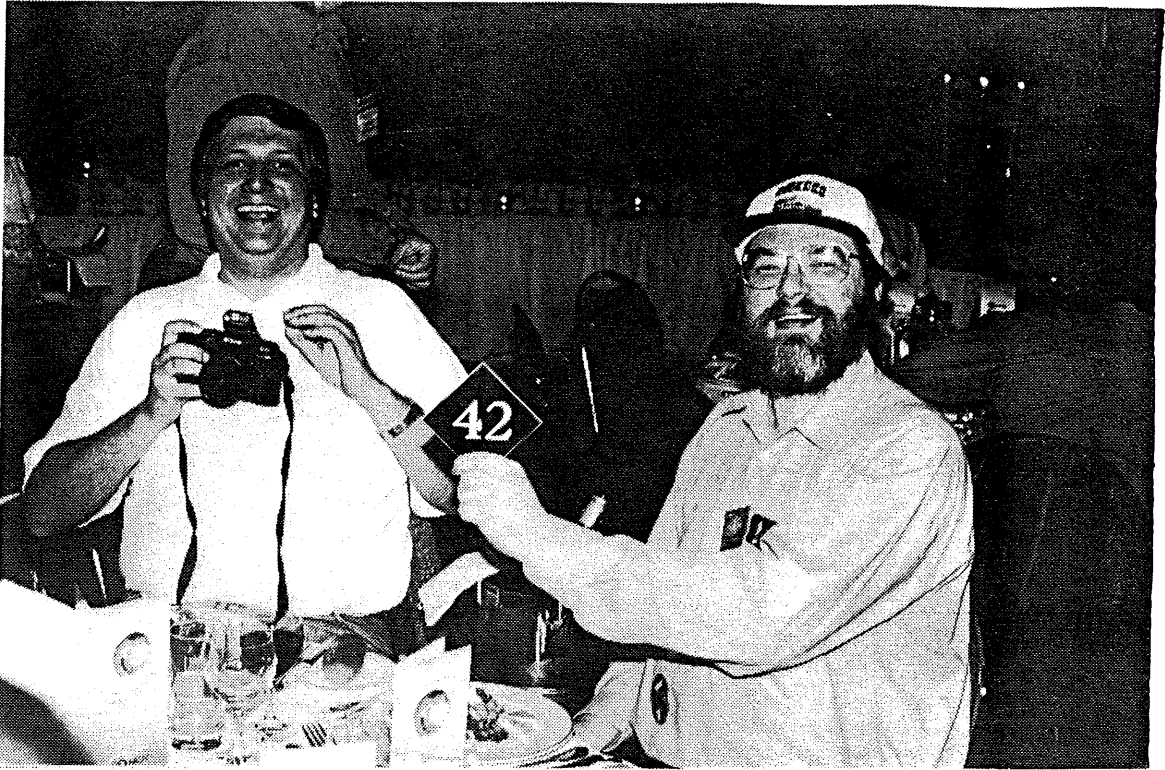




The new high-tech method for advertising web pages.

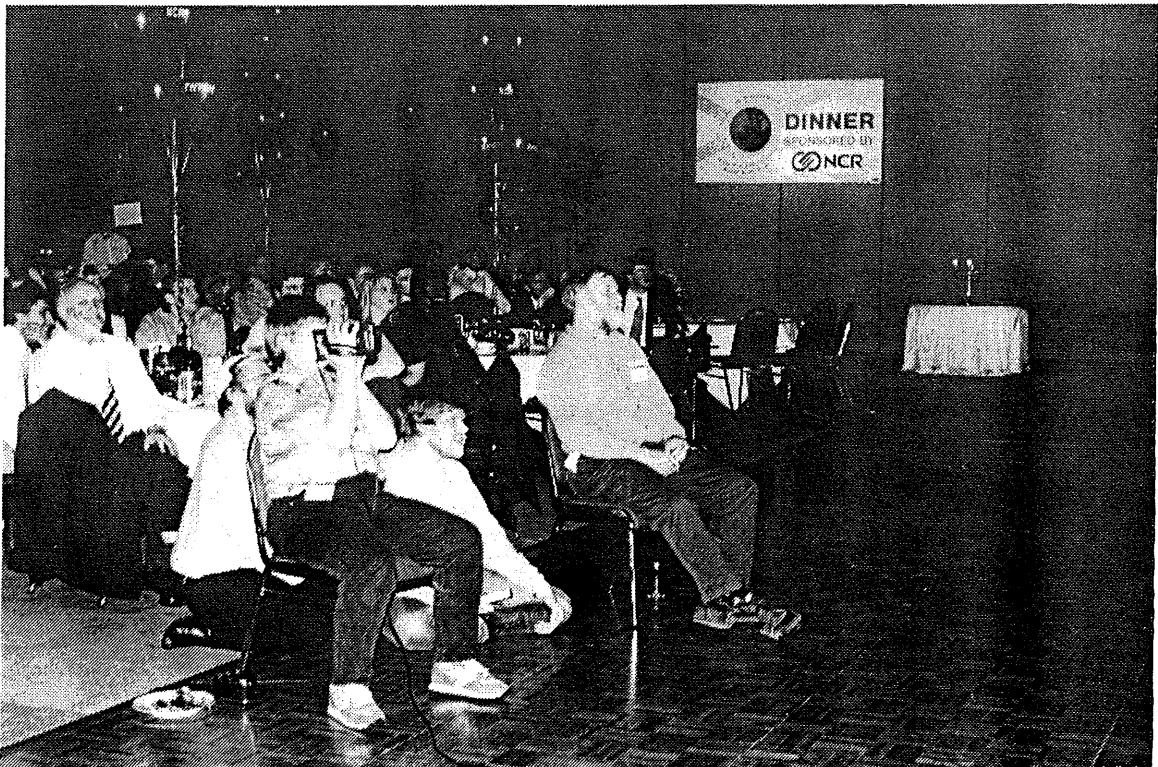


After a hard dat at AUUG, Stephen Boucher (AUUG Treasurer) goes for the OSF approved food of choice.



Enno Davids, Neil Murray, a camera and some guys orange shirt.

Lucy (Stephen Spielberg) Chubb behind the camera, with  
Greg (God of USENIX) Rose in the chair of honour.



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(Company Name)

do hereby apply for:

Renewal/New\* Inst. membership of AUUG  \$350.00  
 International air mail  \$120.00

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 joining/general 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 Secretariat Use**

Chq: bank \_\_\_\_\_ bsb \_\_\_\_\_  
 a/c \_\_\_\_\_ # \_\_\_\_\_  
 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.

# Notification of Change

You can help us! If you have changed your mailing address, phone, title, or any other contact information, please keep us updated. Complete the following information and either fax it to the AUUG Membership Secretary on (02) 9332-4066 or post it to:

AUUG Membership Secretary  
 P.O. Box 366  
 Kensington, NSW 2033  
 Australia



UNIX® AND OPEN SYSTEMS USERS

(Please allow at least 4 weeks for the change of address to take effect..)

- The following changes are for my personal details, member #: \_\_\_\_\_
- The following changes are for our Institutional Member, primary contact.
- The following changes are for our Institutional Member, representative 1.
- The following changes are for our Institutional Member, representative 2.

**PLEASE PRINT YOUR OLD CONTACT INFORMATION (OR ATTACH A MAILING LABEL):**

Name/Contact: \_\_\_\_\_  
 Position/Title: \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 \_\_\_\_\_ Postcode \_\_\_\_\_  
 Tel: BH \_\_\_\_\_ AH \_\_\_\_\_  
 Fax: BH \_\_\_\_\_ AH \_\_\_\_\_  
 email address: \_\_\_\_\_

**PLEASE PRINT YOUR NEW CONTACT INFORMATION:**

Name/Contact: \_\_\_\_\_  
 Position/Title: \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 \_\_\_\_\_ Postcode \_\_\_\_\_  
 Tel: BH \_\_\_\_\_ AH \_\_\_\_\_  
 Fax: BH \_\_\_\_\_ AH \_\_\_\_\_  
 email address: \_\_\_\_\_

**AUUG Secretariat Use**

Date: \_\_\_\_\_  
 Initial: \_\_\_\_\_  
 Date processed: \_\_\_\_\_  
 Membership # \_\_\_\_\_



