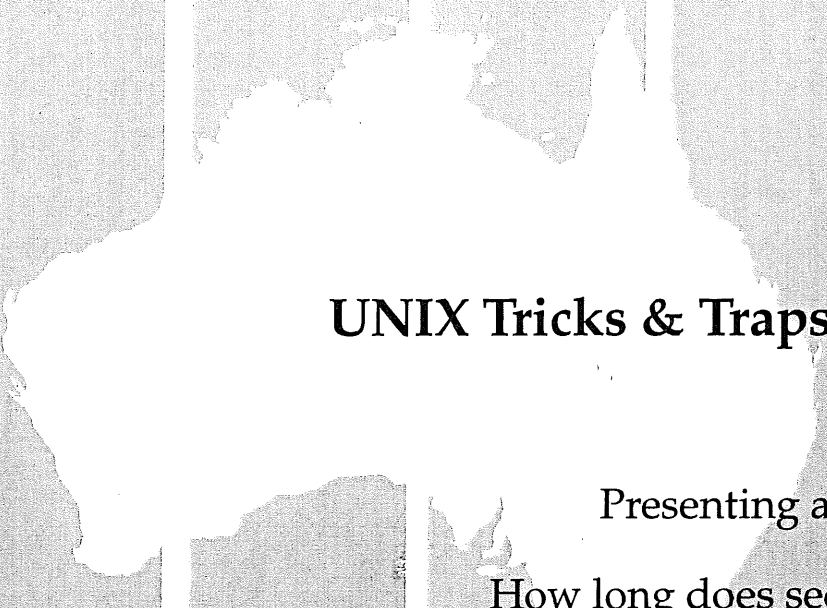


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The Journal of AUUG Inc.

Volume 17, Number 3
June 1996



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AUUGN

Volume 17, Number 3
June, 1996

AUUG Membership & General Correspondence

The AUUG Secretary
PO Box 366
Kensington NSW 2033

Tel: (02) 361 5994
Fax: (02) 332 4066
Freephone: 1-800-625-655
E-mail: auug@auug.org.au

AUUG Executive

President: Michael Paddon
mwp@aba.net.au
Kodak
173 Elizabeth St.
Coburg VIC 3058

Vice President: Glenn Huxtable
glenn@fs.com.au
Functional Software
PO Box 192
Leederville WA 6903

Secretary: Peter Wishart
pjw@auug.org.au
EASAMS/GEC Marconi
Systems
PO Box 4806
Unit 7, 10 Kennedy St.
Kingston ACT 2604

Treasurer: Stephen Boucher
stephen@mtiame.mtia.oz.au
MTIA
509 St. Kilda Road
Melbourne VIC 3004

Committee Members:

Phil McCrea (Past President)
pmc@syd.dit.csiro.au
Division of Information
Technology
CSIRO
Building E6B
Macquarie University NSW
2113

Frank Crawford
frank@atom.ansto.gov.au
ANSTO
Private Mail Bag 1
Menai NSW 2234

Lucy Chubb
lucyc@sw.oz.au
Softway Pty. Ltd.
PO Box 305
Strawberry Hills NSW 2021

Chris Maltby
chris@sw.oz.au
Softway Pty. Ltd.
PO Box 305
Strawberry Hills NSW 2021

David Purdue
David.Purdue@aus.sun.com
SunSoft
119 Willoughby Rd.
Crows Nest NSW 2065

AUUGN Business Manager

Elizabeth Egan
auug@auug.org.au

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PO Box 366
Kensington NSW 2033

AUUGN Correspondence

Please send all correspondence regarding AUUGN to:

AUUGN Editor
PO Box 366
Kensington NSW 2033

E-mail: auugn@auug.org.au

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Editorial

Phil Anderson

Well gang, it's been fun, but I'm sorry to tell you that I'm stepping down as editor of AUUGN. It's been a bit of a roller coaster ride since the beginning of the year, and a number of personal and professional project opportunities have arisen that leave me with a lot less time to give to the newsletter. I'd hoped to see it through to the end of the year, but it ain't to be.

The experience of assembling AUUGN continually reminds me of my brief stint on the old Monash Uni. Astronautical Society's newsletter, CAPCOM. That was back in '79, and the whole thing was assembled with volunteer labour, using typewriters, layout boards, and all the other trappings of the pre-desktop publishing era. It drove us nuts sometimes, but it was a lot of fun too. There was always the bittersweet sense of achievement on seeing the finished product; bittersweet because no matter how careful you'd been, there'd always be some glitch that'd sneak through, and it'd be the first thing you'd see on opening the issue! Seventeen years later, it's a very different game on the surface, but the feelings are the same, and those dang bugs have kept pace with technology all along the way.

Putting together any publication, especially one driven by volunteer labour, draws on the enthusiasm and goodwill of all sorts of people. They commit the time they can (sometimes *more* than they can) and so often it's only that dedicated core that keep the publication from an untimely end. AUUGN is no exception; you keep seeing the same names popping up in the contents page issue after issue, because they believe in the value of the journal, and are willing to make that extra effort to follow through. I thank them all most sincerely for their work—as should you—and hope that many more of you join their ranks in the issues to come.

One such new chum is Gunther Feuereisen, from the University of NSW. He's valiantly offered to step into Janet's shoes for the nonce, to bring you more UNIX Tricks and Traps. So sharpen those points on your heads, give the ol' propeller a spin, and send him your wizardly UNIX tweaks! His first offering can be found in this issue.

So farewell! Support your society! Keep the UNIX flame alight! Remember who your superuser is, and don't forget your password! ☺

President's report

Michael Paddon

In the physics of the open systems universe, the C programming language has served as a fundamental force ever since that continuum's equivalent of the big bang. Just like our own universe, it is hard to pinpoint the exact birth moment of "open systems", however it is common practice to date the epoch from the creation of UNIX (circa 1969-1970).

This is a little inaccurate to say the least, given that UNIX was written in assembler (and hence not particularly portable) and that it sported a very limited functionality. It was, however, a timesharing system from the first, which compares quite amusingly against the recent history of mainstream PC operating systems.

In fact it wasn't until First Edition (1971) that UNIX was written in a portable, albeit limited, systems language called "B". By Fourth Edition (1973), UNIX was written in C, and it was beginning to exhibit the portability that we consider its natural domain. Fifth Edition (1974) was made freely available to educational institutions and the era of open systems had clearly begun. Here ends the history lesson!

The point of all this was not to bore you to death with a dry history, but rather to illustrate that this thing we call "openness" (is that a real word?) is tied far more closely to the C language than it is to any operating system. This was true at the genesis, and remains true today with standards such as POSIX loosening our shackles to any one operating system.

Even within the UNIX world there is wild variation, yet this diversity does not inhibit the porting of code that was written to be portable.

This extends to the non-UNIX system as well, assuming that the vendor approaches portability with an honest effort, and not just a "tick the box" mentality. Regular readers of AUUGN will recall last year's fuss over the Windows/NT POSIX subsystem as a case in point.

Which brings us full circle to my original metaphor. The C programming language is the gravity of the open systems universe, a constant force that binds all things open together. Just about every important piece of open software is written in C, or a derivative (like C++), or in a language whose compiler/interpreter is written in C.

Not bad for a flawed language. Remember what a truly dangerous tool C was before ANSI got to it? Even today, there are still warts left over from when

President's report

it used to be a high level assembler, as well as more fundamental problems: for example consider issues as diverse as scoping, exception mechanisms and multilingual support.

Even when compared with its contemporaries, Algol and Pascal, C looks somewhat anaemic. But the strength of C does not lie in theory, it lies in practicality.

What you can effectively achieve with a language is far more important than any other measure. Make note of this fact, for we will return to it.

Today there is a new game in town: Java. Cutting through all the marketing hype and propaganda (both positive and negative), Java is a relatively simple new object oriented programming language that assists in the construction of network downloadable applications.

That's just about all there is to it, despite all those millions of words written about it by people who think that the Internet was invented in 1992, that HTML is a programming language, and that the phrase "paradigm shift" is a cool and edgy thing to say.

Let's explode a few myths and make a few observations.

There is nothing special about Java as a language. Sure, it does garbage collection, it's got references instead of pointers and it has a security model enforced by its virtual machine. None of these are ground breaking (though some of the security stuff is pretty interesting).

Similarly, C is not special as a language. If Dennis Ritchie had decided that an extended Algol was a great systems language we'd all be compiling with a GNU Algol compiler today (gal?).

Java, like C, is highly versatile and portable. In fact Java probably has an edge here, given the virtual machine technology it is layered over. Java also has a highly functional and stable set of libraries, which allows it to be an immediately useful tool for building applications and interfaces without every programmer needing to reinvent the wheel.

There's nothing special about Java's libraries, though, and countless examples of similar bodies of software are available for just about every modern language.

Java does create the opportunity for a completely novel class of application: the ubiquitous, downloadable applet. This is more of a function of the virtual machine however, and many other high level languages could be targeted at the same execution environment.

We could have been really unlucky and have had Gosling decide that Lisp was a spiffy high level language to base an applet language on. Hardly bears thinking about, does it?

Where does this leave us? Java is obviously a good, but far from perfect, language that is Internet portable and allows us to construct new kinds of programmes. Not unlike C, Java is a pragmatic technology, in the right place at the right time.

As we have already seen, it is languages that drive a new technology, and it is likely that Java (or something like it) will be the powerhouse of the next wave of open systems; one based on downloadable applets and distributed computing services. Java may yet falter as the vehicle of this change, but it is clearly the prime contender. Somehow, Sun have convinced just about everyone to run the Java virtual machine, which just goes to show the benefit of being first in a marketplace.

In any case, I am dead sure that it is a *language* and not a browser or a web server or an operating system or even a database that will be the keystone of future global computing. I'm backing Java. What do you think?

Which brings me to a shameless plug. As you are all aware by this stage, AUUG is presenting a roadshow, from June 21 through July, entitled "Java in a Demitasse". David Flanagan, author of "Java in a Nutshell" (which I highly recommend) is giving a one day tutorial to five different chapters over this period.

This roadshow model is something we've tried before on an ad hoc basis, but we are now getting organised to run two a year on a regular schedule. We did consider three, however the logistics are challenging and we feel that fewer high quality events are preferable.

One of the most difficult things in organising a roadshow is that it is patently impossible to get a presenter around to all of the chapters on the continent in 10 to 14 days (at least if we want them alive at the end of the tour). This always leads to a lot of heartache where we must construct a schedule that excludes a chapter or two.

We are currently working on the principle that, first and foremost, every chapter must get one roadshow a year. We also attempt to accommodate the wishes of the presenter in terms of itinerary (they almost always start or end near the Great Barrier Reef for some reason).

In any case, if the Java tutorial doesn't come to you, rest assured that the next one will (we are planning for November). If you think these roadshows are a

good idea, please support us and attend. In the final analysis it is your interest that makes these events a success.

All this is a natural extension of the AUUG chapter programme and signals an accelerated change of focus from one large centralised event per year to an ongoing fixture of local happenings.

The winter conference will certainly continue to be a world class conference, however your committee

feels that you shouldn't have to visit Sydney or Melbourne once a year to benefit from your membership.

We also feel that the conference format is self-limiting in terms of the scope of material that can be presented.

As always, AUUG is in a state of continual change. Your comments and ideas are always welcome, so please don't hesitate to drop me a line. ♦

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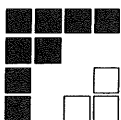
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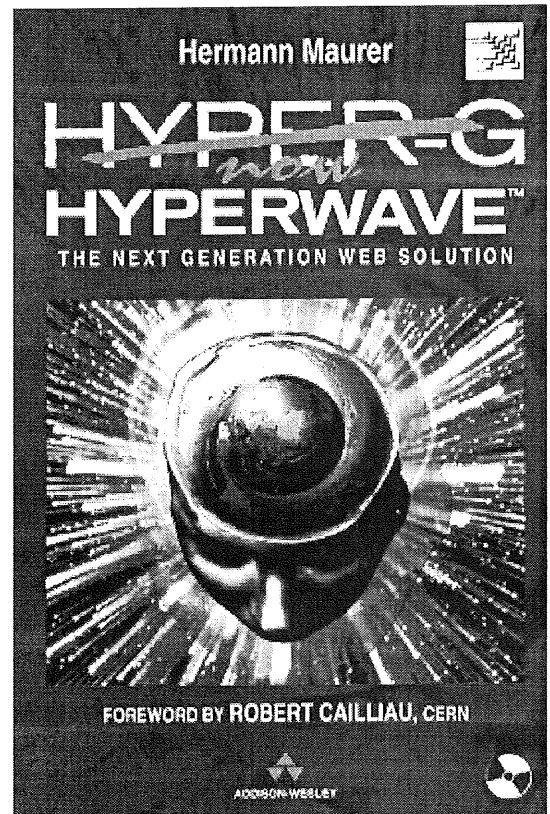
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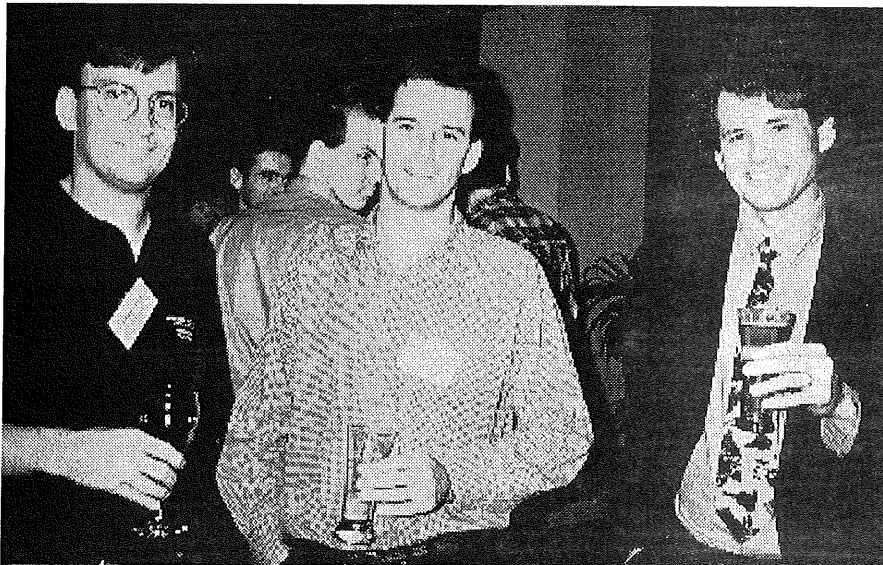
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Wither Go HPC?

Frank Crawford <frank@ansto.gov.au>

Australia keeps making claims to being a country that rapidly adopts new technology, wants to be innovative, and at the forefront of developments. However, in truth, while at an individual level this may be true, at a corporate level, this is far from the truth.

Possibly one reason for this is that Australian's are notoriously lazy, and will take advantage of anything to make their lives easier, but within business, they subscribe to the philosophy that it is better if it is done overseas.

Nowhere is this more obvious than in the area of High Performance Computing, or more commonly known as Supercomputing. Most people have heard of Cray Research and Cray supercomputers, many have even heard of Silicon Graphics and their graphics performance.

But the use of such systems within Australia, is very different to that found overseas. For example, the US government set up a number of supercomputer centres, with the aim of fostering collaboration between industry and science. This proved to be a huge success, and they have now moved on to the next stage, where they are no longer funding these centres for such collaboration, but are expecting them to be self funding.

Aside from this US companies themselves, have picked up on the benefits of HPC, sometimes initiated by such collaborations, sometime just from the obvious economic advantages to competitors. You will find HPC systems in many industries, ranging from aircraft design, to economic forecasting, drug design to weather forecasting. In fact any industry where mathematical and computer models can be constructed and manipulated.

This trend is not just confined to the USA, Japan are probably one of the largest users of supercomputing within the world, and new industrial giants, such as Korea, also have made extensive use of HPC. Europe, as well, have a large number of HPC facilities, although the largest of these are related to either government or academic environments.

When you look at the situation in Australia, it is difficult to believe that any of the people in power, be it government or business, are aware of these events. Within Australia, there have been a number of attempts to setup HPC centres, almost always to no avail.

One of the problems with the setup of these centres, is that they are expected to be money making propositions almost from the start, and yet they have been constrained by tight budgets, and lack of funds to meet client needs.

In almost all cases the initial cost of the hardware has dominated thinking and yet, without software, such a system may as well be a pile of junk. Unfortunately, the cost of software for such systems is high, and the variety needed is relatively large. Without such a range it is very difficult to demonstrate to unsure businessmen how they can make best use of the facilities.

So what use can Australian business make of HPC facilities? Firstly, these systems are not designed to replace what is currently calculated on the Pentiums that now seem to be the main work-horse of industry. Rather they allow a whole new dimension of calculation to be undertaken, either literally, for example by calculating in three dimensions rather than two dimensions, or in much more detail.

The other side of HPC is the issue of visualisation. As the calculations become more extensive, the volume of results become too large for simple examination, and it becomes essential to process the data in some fashion to make it more comprehensible. This can be as simple as plotting the data in a number of different fashions, to overlaying it on an understandable background, e.g. a map, to a fully computerised graphics display such as seen in computer animations.

Like anywhere else in the computer industry, the use of such facilities takes considerable experience and knowledge, much of which is very specialised. These skills can only be learnt in a HPC facility, but the lack of these facilities means it is generally unlikely.

This is one of the major problems with the current policy within Australia, and why some form of support is required in the early stages. Without such support, the basic skills are never developed, and the impression develops that we are not in the same league as elsewhere.

Within Australia there are few real HPC centres, and one is at the Australian National University (ANU), within their Supercomputer Facility. This is not a teaching faculty, but rather a unit setup especially to develop and utilise the benefits of supercomputers. It is primarily used by researchers, but it does develop skills in the use of HPC which can then be utilised elsewhere.

Another facility is VisLab, located at Sydney University, which is a centre established to make use

of many of the modern techniques and skills necessary for visualisation, i.e., to handle the volumes of data generated by modern systems.

These are not the only facilities within Australia, although they are probably the premier ones. They, together with the other smaller centres, are developing the skills necessary for HPC, but we still need to work on the transfer of these skills to use by businesses. This is an area that will take money, and a long term view, things not commonly seen either in Australian business or in the public sector funding. ♦

Presenting at AUUG96 Conference

Frank Crawford

Anyone involved in AUUG, either as a member or just as an observer would be aware that the next winter conference will be held at the World Congress Centre in Melbourne, between 18th and 20th September. Again, this year, the conference will be held in collaboration with Charles Sturt University. As usual this will be preceded by a number of tutorials, probably as during AUUG95 covering two days, the 16th and 17th.

However, while this event is the biggest open systems event in Australia, attended by well over 500 people (over 800 at AUUG95!), it is a constant battle to obtain high quality papers and tutorials, despite work being carried out in this area. By now you should have seen the "Call for Papers" for AUUG96, outlining the relevant dates for submission of abstracts, final papers, etc.

What I would like to do here is to encourage you to submit either a paper or a tutorial for this exciting event. While AUUG conferences traditionally have a theme that they work towards, the program committee is willing to consider proposals falling into the open systems area, networking or the Internet.

In fact the conference has three different categories of presentation, technical, management and tutorials. The technical stream is designed to appeal to those who want either detailed knowledge of how the technology works, be it a detailed presentation of a new protocol, code or product. On the other hand, the management stream is designed to give an

indication of how the technology can be used, without going into too much detail about how it works. Presentations within the two streams are designed to fit into a 30 min. slot, allowing some time for questions.

Finally, the tutorials, which in fact can be either technically or management oriented, are a much more in-depth presentation, running either a half or a full day, and giving those attending useful knowledge that they can use in their current field.

While many people attend in order to obtain new information, knowledge is only valuable if it is shared. Without such sharing, it is impossible to verify that it is correct or even useful. By presenting either an outline or details of current projects or research interests it is possible to find others who are either working in the same field and can assist you, or who are interested in your results and willing to support you.

So, if you have anything that you feel is valuable to the computing community within Australia, whether it is in a technical area or a management area, you should consider presenting at AUUG96. It will certainly be aired before one of the biggest and most diverse cross-section of local computer people and is very likely to attract interest.

Rather than sitting back, you should submit an abstract to the program committee, outlining your presentation and see if you can join those others who are trying to influence the direction of computing in Australia. ♦

Is a Standard UNIX a Good Idea?

Frank Crawford

If you read any sales pitch by an NT salesman, you will always see a line about NT being standard across their entire hardware range "unlike the many variants of UNIX". While this makes good copy for advertising NT, is it really true, and is it really a good idea to have a single standard version?

For a start, UNIX is far more standard than it appears from the advertising. For most of its life the system calls and standard libraries have been just that, standard. This is obvious from the volume of public domain software that has been ported across virtually all UNIX platforms. This has been written by the average programmer, who then found that it was simple to port it to some other system.

For more official standards, X/Open has the Spec1170 standard which specifies 1170 APIs that are required on UNIX systems to be certified. While the X/Open standard is more complicated than just a list of APIs, it does show the commonality across the range.

As well as this, a number of Application Binary Interfaces (ABI) have been defined on many hardware platforms, allowing shrink-wrapped software across different UNIX versions, including Intel x86 and Motorola 68000 CPUs.

However, even more importantly, a single standard is not what is required. Architectural differences, marketing differences or even technological changes mean that there needs to be freedom for improvements, driven by user needs. For example, do you require the same batch facilities on a PC print server running Linux as is needed on a Cray supercomputer? The fact that different vendors add extensions to the UNIX standard allows them to both adapt to their requirements or try new features to gain market share.

This also brings in the issue by many software vendors that "there are too many versions to port to". However, the major difficulty in porting is related to the use of these extensions, for higher performance. If there were no use of the extensions, then a simple recompilation would be all that was required.

On the other hand, the inclusion of new features is always a possibility, for example, who could disagree with the inclusion of TCP/IP in the original versions of BSD UNIX? Today these facilities are in every version of UNIX, and even a standard for

Window's PC (WinSock). This process is continuing with new standards being defined for multiprocessor support, distributed computing and other advances that are only theory at present.

Differences in UNIX are not only caused by additional features in the versions of UNIX, but also simply the long life of UNIX. Just because a vendor upgrades to the current standard, doesn't mean that all customers will instantly, or even eventually, upgrade to that version.

The number of UNIX vendors itself causes some variation in the versions of UNIX, as some will be more proactive in fixing problems. For example, when you look at recent security problems, some vendors will have patches out within days to correct them. This in itself is a sales point, as for some applications the speed of fixing problems may be an issue, for others it may not be as critical.

Having a single version of UNIX, would mean that any changes would have to be coordinated through a single bureaucracy, with delays both in reporting, correction and then distribution. As well, it is obvious that the total number of people employed to review and correct problems with UNIX today, is far more than if the work was only done by a single group.

As a final point, the claim that there is a single version of NT is itself a fallacy. For a start, there have been a small number of different versions of NT released, with more in the future. As well, at the lower levels, there are significant differences, many hidden but still there. For example, it has been reported that the hardware abstraction layer for Compaq systems is sufficiently different that you cannot use the version distributed with the standard NT distribution.

Even more importantly, if the performance features of the hardware are not being appropriately used, be it an Intel Pentium or a Digital Alpha, then the customer is being disadvantaged, as they are expected to over configure the system for the software vendors' benefits.

In conclusion, while UNIX may have a number of varieties, the differences are minor compared to the similarities. While these differences go to make UNIX stronger in the long run, allow rapid adaption to changes, fast correction of problems and optimum utilisation of the hardware. The cost for this is some extra work by software vendors, however, this is only required if they want to take advantage of the extensions, rather than staying with the defined standards. ♦

Comments on the Future of the Internet

Frank Crawford

For some time AUUG has been seen as one of the major technical organisations involved in the Internet in Australia, and so at the recent AUUG NSW Summer Conference we took the opportunity to hold a discussion on what those actively involved in the industry thought the future would be.

Those present included technical staff from Internet Service Providers (ISPs), TCP/IP system developers and researchers, net users from within Sydney and elsewhere within NSW and novices looking at joining the net.

The first issue covered was that of bandwidth, both within Australia and overseas. With the change of the responsibility within Australia from the AVCC through AARNet to Telstra through TIS and the rapid increase in bandwidth, it was an obvious issue. In general the audience agree that this change was inevitable, and in general seemed to be working. There were a few concerns with both unmet performance targets and the fear that Telstra would try and be both a bandwidth provider and a service provider.

There was a belief that some areas of network engineering needed to be looked at, such as having two separate links to the US (which is now being merged to a single link by TIS). One major concern here was that when TIS took over the AARNet there were promises that archive and other proxy servers would be introduced, but this had not eventuated. There was some uncertainty whether these servers would be better located within each regional network organisation (e.g., Sydney, Canberra, etc.) or as a single much larger national server.

Discussion then continued on the changes occurring within ISPs, who have been springing up in all sorts of areas. One statement that was made was that ISPs today were the business equivalent of video shops in the 1980s. There will be lots of shuffling, merging and failures over time.

The ISPs that will survive will be those that provide service and assistance to their customers. The type of service will vary from ISP to ISP, for example some of the larger ones are aimed at corporate customers, while others may be aimed at special market niches. Such niches may be a particular occupation (e.g., Jewelers with the Australian Jewelry Network), ethnic groups or locality.

A discussion of ISPs outside Sydney indicated that they do seem to be appearing, although, generally there is only one for a particular area. For those considering starting up as an ISP, an important comment by those ISPs present was that there is no profit in simply being an ISP. The best setup was to establish it as a means of covering the costs of your own network connection. Any profit is only made from add on or other services, such as training, software development or other services not directly related to the business of being an ISP.

A mention was made of the cost of network connections, and while they have gone down, no one felt that it was cheap, and in fact some services, such as MSN were thought to be very expensive.

On the actual usage front, the major reason for joining the net has changed from simply getting e-mail, to wanting to establish a presence on the "Web", and thus from primarily technical users to commercial users. Everyone today "needs" to set up a home page, display their product, put images for customers, and generally set up a virtual marketplace. The issue of payment within these virtual shops is an unsatisfied issue, but that is coming rapidly. While most long-term users of the net weren't thrilled by this development, they did accept that it was the way of the future.

Security was a concern, although wasn't considered a major problem for the small user. In fact when the question came up of whether people would be willing to send their credit card details by e-mail, most agreed that while this wasn't safe, it was far safer than using a credit card in some less reputable shops or restaurants.

On the issue of the future, no one was really willing to look more than a year ahead, and that was only a continuation of today's activities. There is the belief that major changes will occur, but the direction is not easy to predict. The major growth in the near future is certainly seen to be the World Wide Web and related activities.

On the final question of basic changes to the infrastructure of the network, with the introduction of IPv6, no one was particularly concerned with this. This was believed to be even less of a problem as IPv6 includes compatibility with the current generation of networks.

So in all the session was valuable to those present, as it gave them both a chance to air their views, and also to ask questions that may have been worrying them. All participants were sure that the Internet in Australia was here to stay, and in fact, will grow to become an essential service, but what it will look like then is hard to identify. ♦

Can existing security solutions scale cost effectively?

Marcus J. Ranum

Lots and lots of people are trying to figure out how to make money over the Internet. The problem is that all the currently thought-of ways to make money involve large volumes of transactions.

Large volumes of transactions are a nasty problem because they have to be FAST and CHEAP and if they involve security then you are up against the universal law:

"Cheap, Fast, Good—pick any two"

It's simply not going to work if every E-cash transaction costs \$.001 for processing, but the processing bureau needs a warehouse full of CRAYs.

We security experts have our work cut out for us!! If all the commercial firms that are eyeing the 'net as their future playground, they have to find a model that is profitable, and if it's security significant that means that we security experts need security that violates the universal law and is simultaneously cheap, fast, and good. I don't have the reference but one analyst group (Yankee, I think it was) has even published conclusions that indicate that nobody actually cares a fig for security for Internet transactions; they only care because the New York Times said it was a problem. The interesting conclusion Yankee made was something to the effect that if all the Internet's security problems were fixed tomorrow, it would not be noticeably better as an environment for doing the kind of commerce that is currently being done.

What I wonder, though, is if anyone *KNOWS* that is currently being done! In my wanderings this last year, I have seen things being sent across the 'net, with no security, that absolutely terrify me. Patient medical records, military logistics(!), bank transactions, stock trades -- all manner of completely, mind-bogglingly scary stuff. But it's OK because it hasn't made the New York Times. Yet.

Perhaps the security model of the future is the "school of fish" technology. Assume that if all the fish "just do it" a few will get snapped up and eaten but the vast majority will continue to cheerfully swim and spawn and be happy. Come to think of it, that's the "security model" for credit cards. I'm getting cynical in my old age, aren't I?

Marcus Ranum is the Chief Scientist for V-ONE Corporation, and a well respected figure in the Security community. This article was based on an idea Marcus originally posted to the Firewalls mailing list. ♦

How Long Does Security Last

Frank Crawford

So your site is now secure. You've spent lots of time and/or money on putting in the latest in security software, firewalls, auditing and related systems, and now you can sit back and let your staff get on with their "normal" functions knowing that they will be safe from external attack.

Unfortunately, you are wrong, and if you do sit back, you are likely to find your site easily penetrated in a year or so. Securing a computer site is more like securing your car from theft, than securing your house, because of the rapid changing environment. The design of houses has not changed in centuries, and while some of the materials used may have changed, this change is measured in decades not weeks.

On the other hand, as new model of cars come out every year, they open up new problems with every redesign. Even more importantly, only recently have car manufacturers started considering security during the design stage. So, while the latest models may be more secure, there are plenty of models still around which are easy targets.

When you move on to look at computer security, the seen becomes even more frightening. For a start, the industry is changing at an ever increasing pace. Where something was just a concept yesterday, it is today being sold as what you need to keep up, and is finally deployed everywhere within a year.

At a more basic level, the underlying structure was never designed with security in mind and, no matter how much work is put into security of the higher level layers, it is all being built on a shaky foundation.

These problems don't mean that security is impossible to achieve in the computing environment, but it does mean that it takes continual work.

Looking a more concrete examples, prior to about 1992, passwords were generally considered sufficient protection on most account, as the time

taken to crack the average password was thought to be excessive. Today, most sites have access to systems that can crack password of up to six characters, though simple brute force methods, in just a few days. To make matters even worse, methods more efficient than simple brute force such as dictionary lookups, are becoming common. Today, for secure access, one-time passwords and other authentication tokens are recommended.

When looking at the network level, spoofing of addresses, i.e., where addresses within your network are forged by hackers outside your network, have been a theoretically possibility since the late 1980s. However, no one considered it when designing firewalls and other network protection, until hackers started using these mechanisms in scripts and programs to break into sites. Today, setting up access lists to block address spoofing is one of the first items considered for packet filters.

Looking to the future, encryption is now being sold as the way to ensure security of data transmissions and related activities. While this may be true today, next year or the year after, the current methods will be broken by some "unexpected" method. This may be brute force or it may be through detailed analysis.

Even just looking at the history of encryption over the past few years, it has been a continuing battle between cryptographic designers and cryptographic crackers. When Rivest, Shamir and Adleman published a challenge in Scientific American in August 1977 to anyone who could decrypt a message using the, then new, public-key encryption system, they claimed that it would take 40 quadrillion years running time to break the message.

The message was broken in April 1994, after a period of only eight months using 1600 systems throughout the world!

The reason for the "rapid" breaking of the code was the increase in computing power and the use of different algorithms and methods than originally envisaged by the designers.

The most widely used public-domain encryption program, PGP, has itself been affected by these changes. When it was originally released, it supported a key size of 384-bits. Today it is recommended that the minimum size used is 1024-bits, and the latest version supports key sizes up to 2048-bits.

And now, by analyse of timing delays in network encryption systems, it is theoretically possible to crack network messages. While this is unlikely to be a problem in the short-term, it does show that

unexpected techniques may affect currently "unbreakable" schemes.

All this doesn't mean that security is not possible, but it does mean that continual monitoring and upgrading of any security system is a necessity. Whatever is in place today will certainly not be secure within a year, but which areas will be vulnerable cannot be predicted in advance. These holes will have to be closed as they become known. ♦

Summary of IDC Industry Briefing

Phil McCrea

I attended the annual IDC industry briefing recently. This is an event when IDC, the market research company that specialises in IT, lets us know what happened last year, and projects what is likely to happen in the next few years. Whilst a lot of the material is fairly dry, and it's a bit hard to concentrate in the afternoon after a generous lunch, it is a good opportunity to get a feel for trends in the industry, and of course to meet people.

This article summarises the areas where UNIX was mentioned.

Firstly it's reassuring to know that IDC believes UNIX is alive and well, particularly in the mid-range, or multi-user area, also called the 'server' market. Philippe de Marcillac, the visiting IDC Vice-president, reported that NT was starting to make inroads into this area, but that "UNIX will not be displaced easily". UNIX in fact is moving up-market and dominates the high end of the server market, where high availability and mission critical systems are important. Those of us who have been involved with UNIX for some time will chuckle a little over this—several years ago UNIX was considered to be too boffinish to be in any way trustworthy!

The two other operating systems in the high end of the server market are OS/400 and VMS. Whilst there is still a strong installed base of these two operating systems, there is very little growth—only around 5% last year, compared to UNIX's whopping growth of 31%!

These good UNIX figures are tempered somewhat, however, by poor performance in the UNIX workstation area, which actually shrunk last year in dollar terms, although shipments were up. This is due mainly to the ever improving

price/performance of PCs, which are threatening the UNIX workstation 'space'.

In terms of vendors, HP dominates the UNIX midrange area by a fair margin, with almost 30% of revenue in this area last year. However, Both IBM and DEC exceeded HP's revenue in the midrange area, thanks to their proprietary operating systems, although with the huge anticipated growth rate for UNIX, this situation will not last more than another year or so.

In the UNIX workstation area, Sun is dominant by a country mile, with 40% of units shipped, and about 30% of revenue. The big improver in this area is SGI, who almost doubled their shipments last year, although with very little revenue increase.

There were a couple of interesting gems from some other speakers. Tony Langman compared the current IT industry with the car industry from the 1930s. He showed an advertisement for a 1935 Chrysler Plymouth from York Motors, Sydney. The advertisement concentrated on technical features of the vehicle in some detail, such as the cooling system, brakes, and suspension. By comparison, contemporary advertisements for cars concentrate on areas such as driver comforts—i.e., on the 'user'. He then showed a recent advertisement for a PC, replete with jargon such as 16Meg memory, 1 Gbyte disk, 100Mhz processor, PCMCIA, etc. It's clear that the IT industry still has an obsession with itself—it's users who buy computers now, not boffins! As it matures, advertising will begin to focus on the user.

One final point was worth noting. Peter Hind summarised a recent comprehensive survey of MIS managers that he had carried out. Lots of interesting figures, but the most interesting statistic to emerge was the response to a question on whether they used the Internet today for electronic trading. 10% of respondents indicated they were—but a whopping 60% said they would be by the end of 97!!

A second interesting result of the survey is the intention of most organisations to install Intranets.

In summary, the briefing indicated that UNIX people need have no fears about job security—UNIX is alive and well, and growing at a healthy rate. But when you add the Internet, which after all is a creature of UNIX, into the equation, the situation is looking very rosy indeed! ♦

Internet Censorship

Robin Whittle

The debate about Internet censorship encompasses some diametrically opposed views, including the proposal of the NSW Government to impose harsh criminal penalties for any networked communications, including e-mail, which would be classed as "Mature Adult" or beyond in the film classification scheme.

This article highlights some of the problems in the current debate and points to the solution for protecting children. More detailed information is available from

<http://www.ozemail.com.au/~firstpr/contreg>.

Internet communications will soon provide adults with an unprecedented level of control over access to resources by the children in their care. The sophistication of control offered by the Platform for Internet Content Selection (PICS - <http://www.w3.org/pub/WWW/PICS>) far exceeds that which is possible with current Internet filter software such as "Net-Nanny" or with the V-Chip proposal for television.

Those who support Internet censorship and those who oppose it agree on at least one human value: that adults must provide children with a safe and supportive environment in which to play and learn.

Differing human values are significant in the dispute about censorship of communications between consenting adults. One view is that community standards must be protected. Another is that free speech is of paramount importance. A third is that no single set of standards is appropriate to all citizens of multicultural Australia, so adults should not be constrained by one official "community standard".

The child protection and adult censorship debates are often confused. There is insufficient understanding of the value of the new PICS protocol and how impractical and unnecessary it is to attempt to censor Internet communications. Much of this confusion arises from poor understanding of the Internet and from the belief that it is a broadcast medium.

The Internet most closely resembles the postal network and the telephone system. It is not a broadcast or mass media at all. It is a bidirectional, point-to-point, global communications network—three of the many factors which distinguish it from the unidirectional, one-to-many,

nationally confined distributive model of broadcasting.

Some Internet high level protocols support publishing, based on user driven requests of material from millions of sources—including from domestic users. Broadcasting involves a relatively small number of source controlled streams of material which viewers simply switch between.

With cryptography and the inherent flexibility of the Internet, it is impossible to reliably block or monitor communications between motivated individuals—just as it is impossible to censor the postal service or the telephone network.

The clearly desirable goal of thwarting criminal communication—including paedophiles transferring image files—is unfortunately impossible to achieve. With or without Internet communications, for better and for worse, we are now in an era of extreme information fluidity in which every barrier to information flow can be bypassed in several ways.

How then are we to protect children from unsuitable material?

Three of the four proposals for protecting children from unsuitable material are unworkable. The fourth, based on the PICS protocol, is very promising.

The first proposal is to censor "Internet content" at its source. While this might be achieved, at tremendous social cost, within a single country, it is obviously impossible on a global scale.

The second proposal is to install simple software in the user's PC to detect "banned" words. Thus an incoming text file which includes the word "breast" could be blocked entirely. This cannot work with image files and is such a blunt and poorly directed approach as to be unworkable.

The third approach is to block information packets being sent to or from particular IP addresses. This can be accomplished in the home PC or, with much greater difficulty, in the ISP's router. The immediate effect is to block all communication with specific computers—for instance a single computer which provides e-mail, FTP, WWW and many other services for an entire university.

This "IP address blocking" is a coarse and disruptive method of blocking access to Internet resources. It is also completely ineffective, since even a child can configure their WWW browser to use one of the many publicly accessible HTTP proxy servers anywhere in the world. This enables them to access any site via the proxy -completely bypassing local barriers to particular IP addresses.

The fourth approach is software to control access according to PICS ratings labels. Netscape, Microsoft and other companies plan to integrate this into their browser products by late 1996. This software uses external sources of ratings about Internet resources, enabling adults to fine tune the access criteria for each child in their care.

Before the browser software accesses each file or Internet resource, it first requests labels regarding that resource from one or more PICS label servers—which could be anywhere in the world. These labels contain ratings according to any number of value systems—for instance several different aspects of child suitability. Within a few seconds the access control software receives these labels and uses their ratings to decide whether to request and display each file or image, according to thresholds set by the adult.

PICS based filtering can only be done within the user's PC. It cannot be achieved or imposed by the ISP or government. It does not censor adult use of the Internet. PICS enables a sophistication of control far beyond what most participants in this debate have so far imagined—while attempts to block access to "sites" or censor material at its source offer little or no protection at all.

Robin Whittle's consultancy, First Principles, specialises in telecommunications, privacy and music marketing firstpr@ozemail.com.au Ph. 03 9459 2889 ♦

Paying on the Net

Phil McCrea

Currently the Internet is being used mainly for advertising. Most organisations have created a home page of sorts, even if it's only for the purposes of sticking their toe in the water. Simple Web pages can be put together quite easily, using authoring tools like PageMill or Microsoft's new FrontPage.

The business model with Web advertising is much like any other form of advertising—organisations or business wishing to promote themselves pay the company hosting the material on the Web. There is no cost to the person looking at the advertising.

A few companies have moved from the advertising model to a purchasing model, where catalogues are displayed on the Web and users make purchases using a credit card. In this respect Web purchasing is like mail-order shopping. Web shopping is more popular in the US than it is here, not because

Americans are more adventurous necessarily, but because mail-order shopping is much more part of everyday life in the US than it is here.

The only method of payment at present on the Web is credit, and the main credit card companies are positioning themselves for a major increase in business due to Web shopping. The business model here is transaction based- the credit card companies take a certain percentage of all transactions that take place.

The main impediment to credit card use on the Web is the question of security: people feel uncomfortable about placing their credit card details in 'cyberspace', knowing that it is comparatively easy for someone to snoop somewhere along the line. The situation is looking much better now, with the two main players—Microsoft and Visa—having agreed on a common security protocol, SET. Most of the others credit card companies will fall into line. It will be only a matter of time before the standard browsers will incorporate software to implement SET in future releases of their software. We will then have the option of a pulldown menu which says 'send the next e-mail message encrypted'. There will then be some dialogue as you enter encryption key details.

One of the problems with credit card use is its cost—typically several percentage points, up to as high as 10% for use in a taxi. This mark-up covers the cost of credit card processing, which is a manual process, as well as covering the cost of fraud. Transactions from Web credit card purchasing enter the current paper system, and therefore are subject to the same costs as manual use of the cards. As a result credit cards cannot be used for small Web purchases, such as, say, a daily newspaper.

Electronic cash, or ecash, is a new Internet based payment method which is entirely electronic—there is no human intervention in the settlement process, and as a result it can be used for very small purchases, in the order of cents, and lower. Here's how it works: your bank is 'ecash enabled', and you make a 'withdrawal' of a certain amount of 'coins' from your bank. This money sits on your disk until you use it—much in the same way as money in your wallet. You then go Net shopping and decide to make a purchase from a merchant who accepts ecash. You e-mail the ecash to the merchant, and it automatically increments the merchant's bank account.

At the same time, your bank and the merchant's confer to make sure that the coins you have tendered have not been used before.

This is a functional description, and the details are actually a bit more involved. One interesting feature of electronic cash is that the issuing bank need not know where the money is used, so purchasing can be anonymous, like paper cash.

There are several companies vying for electronic cash market share at present, notably the Dutch company, Digicash, and Cybercash from the US. Digicash has recently established an office in Australia.

Payment on the internet will be a hot area in the next 12 months. Watch this space... ♦

UniForum NZ'96

Frank Crawford

AUUG is not alone in the UNIX world or even in this region, and while most members know of USENIX and UniForum in the USA, they are less aware of many of the other organisations throughout the world. In particular, there are many UNIX groups affiliated with UniForum (as is AUUG), and recently I attended the annual conference of one of them, UniForum NZ, the New Zealand UNIX user's group.

This conference was held in Rotorua from the 21st to the 25th of May, consisting of two days of tutorials and three days for the conference. While the conference was not as big as an AUUG conference, it attracted over 140 people from various regions and sectors throughout New Zealand. As well, it also attracted a large number of overseas attendees, with over a dozen people from the USA and Australia.

The theme of the conference was "UNIX++" and was intended to cover much more than just the traditional UNIX operating system. The intent was to look at the evolution of UNIX, where it is going, to how individuals and organisations can exploit information to gain business advantage.

The structure of the conference was a keynote session, followed by a number of streams, titled "Mainly Management", "Technically Tilted" and "Workshop Wonders", and closing with a plenary session bringing all the streams back together again. The sessions in the "Mainly Management" and "Technically Tilted" streams were generally 40mins, while the "Workshop Wonders" ran for 90mins, and were aimed at a much more in depth coverage of a particular topic.

The topics covered at the conference ranged from the traditional UNIX utilities and enhancements, to technical presentations by vendors and onto such

topics as data mining and case studies of open systems and IT in industry and government. In all, the topics had something for all the attendees, from highly technical presentations to industry overviews.

The attendees at the conference reflected the range of topics, and unlike AUUG's Winter conferences, there were a large number of students and academics discussing their work in the UNIX and Open Systems area. From the management side, there were probably fewer senior managers, but there were representatives from all areas of IT in New Zealand. These people tended to be those closer to the "coal-face", often having a role in both management and technical support.

One interesting point about the conference was the number of overseas visitors who had been to previous UniForum NZ conferences. They found the conference to be both of a high quality, and more importantly, fun. And this was one of the big highlights of the conference, it was an enjoyable conference, for a number of reasons.

The first was the program, it was interesting, but not too slanted in any particular direction. First time UNIX users were catered for just as much as UNIX experts. The size of the conference also contributed to the quality, it was neither too big nor too small. Many of the people knew each other, sometimes from previous conferences, but they were friendly, making first time attenders welcome.

Another element to the enjoyment was the social program, there were activities on most nights, and generally, these catered for partners and even children, so it was possible to bring the entire family without feeling that they would be bored. As an example in the different emphases between AUUG conferences and UniForum NZ, there were two engagements announced at UniForum NZ, demonstrating the fellowship most people felt there.

All in all, UniForum NZ'96 was a successful conference, achieving the goals set by the organisers, including making it an enjoyable event. At the same time, they had a good technical content making it worthwhile for organisations to send their people. ♦



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UNIX Tricks & Traps

Subeditor: Gunther Feuereisen <gunther@agsm.unsw.edu.au>
Tel: 02 9931 9314 Fax: 02 313 7279

Hi Everyone! I'll be helping out with the "Tricks & Traps" column while Janet is away. However we still need contributions from all of you out there! It's your ingenuity and approach to problem solving which makes this column tick.

To start the ball rolling, I thought I'd jump in first with a simple look at how you can use ports to debug errant daemons—something I seem to do a lot of, without thinking much of!

As always, contributions are very welcome.

See you next time! ♦

DEBUGGING PORTS: A DAEMON OF A PROBLEM

Ever tried telnetting to port 25? Sure you have. We all have. A lot of people don't realise how wonderful this feature of UNIX's design is.

The other day I was upgrading our popserver to a new release, and found that it didn't work when trying to pop off mail. The fix? Talk to the pop daemon directly and find out what it's complaining about.

The popper I was installing was the Qualcomm daemon, qpopper2.1.4 on an RS/6000 running AIX 4.1.4. It had a nice AIX makefile, and everything looked okay.

I ran the makefile, installed, updated /etc/services and inetd.conf, and then did a `kill -1` on inetd.

I tried connecting to the popserver via Eudora and got an error.

At this point, rather reading through copious amounts of source code, I decided to talk to the popper directly:

```
coral: [/home/gunther] $ telnet coral 110
Trying...
Connected to coral.agsm.unsw.edu.au.
Escape character is '^]'.
+OK QUALCOMM Pop server derived from UCB (version 2.1.4-R3) at coral.agsm.unsw..
user gunther
+OK Password required for gunther.
pass *****
-ERR System error, can't create temporary file.
+OK Pop server at coral.agsm.unsw.edu.au signing off.
Connection closed.
```

Ok, obviously one of two things is occurring. File permissions are wrong somewhere, or it's trying to create files somewhere it is not supposed to.

Looking at the source code, and not feeling like reading it, I used `grep` to find me what file contained that error message:

```
coral: [/sysadm/src/qpopper2.1.4] # grep 'System error' *.c
pop_dropcopy.c:      "System error, can't create temporary file.");
pop_dropcopy.c:      "System error, can't open temporary file, do you own it;
```

Well, as a primitive guess, if it were a permission problem, we would have got the second line as an error, so obviously it cannot create the file, which means the directory it wishes to use isn't there.

Looking at `pop_dropcopy.c` and using a regex to find that error:

```
/* First create a unique file.  Would prefer mkstemp, but Ultrix...*/
strcpy(template, POP_TMPDROP);
if (((tfn=mkstemp(template)) == -1) ||
    ((tf=fdopen(tfn, "w+")) == NULL)) {      /* failure, bail out */
```

UNIX Tricks & Traps

```
    pop_log(p, POP_PRIORITY,
           "Unable to create temporary temporary maildrop '%s': %s", template,
           (errno < sys_nerr) ? sys_errlist[errno] : "");
    return pop_msg(p, POP_FAILURE,
                  "System error, can't create temporary file.");
}
```

So, the error happens when template cannot be opened, which is POP_TMPDROP.

Using grep again:

```
coral:[/sysadm/src/qpopper2.1.4] # grep POP_TMPDROP *
INSTALL:          may want to change the value of POP_DROP, POP_TMPDROP, and
pop_dropcopy.c:   strcpy(template, POP_TMPDROP);
popper.h:# define POP_TMPDROP      POP_MAILDIR "/tmpXXXXXX"
popper.h:# define POP_TMPDROP      "/usr/mail/tmpXXXXXX"
popper.h:# define POP_TMPDROP      "/var/mail/tmpXXXXXX"
popper.h:# define POP_TMPDROP      "/usr/spool/mail/tmpXXXXXX"
popper.h: * defined by POP_TMPDROP.  POP_DROP and POP_TMPDROP
```

Well, surprise surprise, it was defined in popper.h. Looking at popper.h, the various entries are for specific OS types. For AIX we find:

```
#if defined(SYSV) && !defined(POPSCO) && !defined(LINUX)
# define POP_MAILDIR      "/usr/mail"
# define POP_DROP        "/usr/mail/.%s.pop"
# define POP_TMPDROP     "/usr/mail/tmpXXXXXX"
# if defined(AUX) || defined(AIX)
# define POP_TMPXMIT     "/tmp/xmitXXXXXX"
# else
# define POP_TMPXMIT     "/usr/mail/xmitXXXXXX"
# endif
# define MAIL_COMMAND    "/usr/lib/sendmail"
# define OSDONE
#endif
```

Hello. POP_TMPDROP points to /usr/mail/tmpXXXXXX. Now, for those of you who don't realise the significance, in AIX 3.2.5 /usr/mail -> /usr/spool/mail (well, /var/spool/mail actually, but /usr/spool/mail points there also), but in AIX 4.1.* there is no /usr/mail, only /usr/spool/mail.

The fix, change the directory:

```
#if defined(SYSV) && !defined(POPSCO) && !defined(LINUX)
# define POP_MAILDIR      "/usr/spool/mail"
# define POP_DROP        "/usr/spool/mail/.%s.pop"
# define POP_TMPDROP     "/usr/spool/mail/tmpXXXXXX"
# if defined(AUX) || defined(AIX)
# define POP_TMPXMIT     "/tmp/xmitXXXXXX"
# else
# define POP_TMPXMIT     "/usr/spool/mail/xmitXXXXXX"
# endif
# define MAIL_COMMAND    "/usr/lib/sendmail"
# define OSDONE
#endif
```

Recompile and reinstall. Let's test it again:

```
coral:[/home/gunther] $ telnet coral 110
Trying...
Connected to coral.agsm.unsw.edu.au.
Escape character is '^]'.
+OK QUALCOMM Pop server derived from UCB (version 2.1.4-R3) at coral.agsm.unsw..
user gunther
+OK Password required for gunther.
pass *****
+OK gunther has 0 message(s) (0 octets).
quit
+OK Pop server at coral.agsm.unsw.edu.au signing off.
```

Connection closed.

Problem solved..

What I hope I've shown is that by direct interaction with a daemon, by telnetting to the port it operates on, and then sending command requests, it is possible to detect, diagnose and solve any problems related to the running of an errant daemon.

A pop daemon is only one example. Some of your other common ones include:

SMTP port 25

Great for diagnosing problems with e-mail and finding out exactly where someone's e-mail is going to, or should be going to.

NNTP port 113

If you get really adventurous, write your own newsreader. Otherwise read articles straight off your newsserver. A silly way to do it—but it does amaze onlookers ; -)

HTTPD port 80

Wonder why that pesky web server isn't doing what you told it to do? Talk to it directly and find out what it thinks is the way of the world. Suddenly everything will be made clear.

Check out your RFCs for the protocols and their corresponding commands, and get chatting one-to-one with your friendly daemon. ♦

- ✓ TCP/IP Network Services.
- ✓ Unix Systems Administration Services.
- ✓ Unix-MS Windows Integration.
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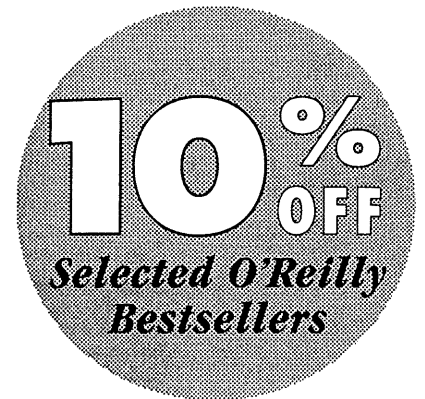
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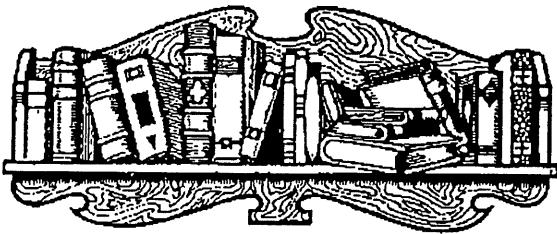
Book Reviews

Sub-editor: Frank Crawford

Another issue rolls around and we have books, books and more books reviewed by members of AUUG. In fact there are so many good books coming out that we can almost fill an edition of AUUGN by just with them. This time we have books on IPv6, AIX performance tuning, Standard C, the X protocol, databases and best of all UNIX internals. These books are all relevant to many members of AUUG and should give you some thought about what to buy.

Along with those being reviewed, 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 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) 717 9273, with your contact details and preferences. ♦



IPv6: THE NEW INTERNET PROTOCOL

by Christian Huitema
Prentice-Hall
1996, 188 pages
ISBN 0-13-241936-X

Reviewed by Mark Delany <markd@mira.net.au>

Have you ever looked at the header of an IP packet and wondered "why on earth did they put that field there?" or "why did they squeeze all that functionality into so few bits?". Well, in the years to come people will ask the same sort of questions about IPv6.

Christian Huitema in "IPv6 The new Internet protocol" provides an excellent explanation as to why various design decisions were made, what the trade-offs were and which contentious issues remain. And, as a former Chair of the Internet

Architecture Board (IAB) Christian speaks with justifiable authority.

In part, Christian provides a potted history of the development of IPv6, even dipping into the politics on occasions (I recall the workout that the IETF mailing list got at that time and Christian sensibly avoids re-opening old wounds).

If that was all this book offered, it would still be of some merit to those interested in the intricacies of a new protocol. But IPv6 is far more than an exercise in protocol design; when deployed it will affect all of us in some way.

While the looming address space crunch of IPv4 is the driving force behind IPv6, Christian makes it abundantly clear that address space is only one area affected by IPv6 when he discusses the impact on:

- LAN administration
- WAN administration
- Router management
- Security
- Real/time capabilities
- Network programming
- Transition management
- IP over ATM

The impressive part about all this is that in 188 pages, this book does address all those topics and more. In the area of security, one gets the feeling that Christian is offering little more than a transcription of the Internet drafts, but in all other cases he demonstrates a competent understanding of the subject.

Of course the detail isn't sufficient to write a protocol stack, nor does it provide enough information to re-design the network layout of a large ISP, but it does create a solid framework along with plenty of links to more information.

This is not to say the book is without faults. As seems inevitable these days, the editors have let through an irritatingly large number of typographical errors. Christian is French and I suspect that the editors could have spent a little more time polishing his English style to suit the target audience, (do we really "suppress fields" or "officialise" TTL behaviour?) I also find the staccato style of sentences. Rather hard to read. Especially to start with.

In the end though this book is of significant value. It's audacious in its coverage, it assumes an intelligent reader, it clearly raises the awareness that

Book Reviews

IPv6 is far more than an address space solution and it provides a valuable insight into why the protocol is the way it is. ♦

AIX PERFORMANCE TUNING

by Frank Waters
Prentice Hall
1995, 316 pages
ISBN 0-13-386707-2

Reviewed by Matthew See <see.matthew.me@bhp.com.au>

Read this book if you are interested in UNIX performance tuning.

APT is a glossy version of the IBM manual SC23-2365-03 "AIX Versions 3.2 and 4.1 Performance Tuning Guide", commonly referred to as "The Bible" of AIX performance tuning. This first edition of APT is essentially the same document as the Fourth Edition of the internal manual, except re-badged under the name of Frank Waters.

The preface suggests that the enclosed material would be of use to programmers, system managers and end users, preferably with some AIX experience. Given that most end users would rather watch a snail race than know the workings of UNIX, this book would be more suited to programmers and administrators. At this level, APT works well, and would be a useful read for those of us into UNIX performance tuning or programming.

The basic process of analysis, benchmarking and system tuning is covered in the opening section of the book. No rocket science, but good practical advice for the novice.

Later sections contain detailed technical discussions based on each critical resource: the CPU, memory, disk and network subsystems. This forms the best part of APT, and successfully combines material from a range of technical and literary articles. Topics covered include system and application performance tuning, AIX performance tools, and of course, RS/6000 and AIX (3.2.5 through 4.1) performance issues. Included throughout are useful scripts, and plenty of hints on effective program design and programming techniques—very handy. ♦

CLIENT/SERVER DATABASES: ENTERPRISE COMPUTING

by James Martin and Joe Leben
Prentice-Hall
1995, 352 Pages
ISBN 0-13-305160-9

*Reviewed by Greg Black
Greg Black & Associates <qjb@gba.oz.au>*

My technical bookshelves have more volumes from Prentice-Hall than any other publisher and most of them are pretty good books. This one, covering the important topic of database software in the major modern computing environment, struck me as likely to be of interest to AUUGN readers—at least its title gave that impression. Sadly, although it probably won't do anybody serious harm, it's not likely to contribute much of value to most readers.

I like technical books to identify their target audience clearly, as this allows people to avoid wasting time on material of little use to them. However, any book that lists so many groups of people and with such a spectacular range of competencies, is aiming so broadly that its coverage is probably going to be rather thin. In fact, with the exception of the final category (students), anybody from the list who needs this book has probably got their job under false pretenses and won't be able to escape detection after wading through it.

First-year students who need an introduction to database software might find some value here, although even they are more likely to find it useful as a cure for insomnia than a source of hard information.

The book is divided into five parts plus some appendices, a glossary and index. Part 1, "Information and Data", gives a very vague and general introduction. The few items of real information are all repeated several times, often in almost the same words. This practice of repetition becomes extremely tedious as you work your way through the book, as it's a real chore to force yourself to re-read the same stuff constantly just on the off-chance that there's something new buried inside it.

Part 2, "Database Software", is mainly a historical coverage of the topic. Part 3, "The Client/Server Environment", discusses the theory of distributed computing in a very abstract fashion. Part 4, "The Relational Data Model", attempts to describe the basic theory behind this topic but throws more repetition than light on it.

By far the longest, Part 5 goes into SQL in surprising detail and even provides a useful introduction to the topic for neophytes. However, even this is far from complete as a tutorial and is not likely to be a major reason for purchasing the book. And, since all the examples of embedded SQL are done in COBOL, all those funny people who want to use any of the half dozen other programming languages that are mentioned will be left in the dark.

The Appendices cover QBE, "Codd's Relational Rules" and "Object-Oriented Databases" without adding much of substance. The Glossary includes terms that are not used in the book, while the Index misses important terms that are used (although some things that only appear in the Glossary are indexed).

The front and rear end-papers both have a graphic display of "the James Martin books" which at first sight seems to include even more titles than the list on page ii, under a wide range of themes. However, closer inspection reveals that several titles get a run under two or three separate categories. And there lies a hint about the nature of this book—it seems that James Martin is in the business of producing books.

The style of this book gives the impression that it was created more by cutting and pasting paragraphs from some general reservoir of words than by sitting down with a clear goal and writing original thoughts. Most of the text is abstract and wordy waffle. Most of the information is stated as fact without any kind of supporting explanation. And, from the point of view of AUUGN readers, the choice of Microsoft Access for illustrative purposes will be of limited usefulness.

In the final analysis, here is a book that is written like one of those hastily cobbled-up newspaper stories—full of general statements that rarely convey the real truth, and with no hard information. At the end of the book, a reader would not be able to do anything new of any significance—not even evaluate client/server database software. I recommend leaving it on the shelves next time you are browsing in your favourite bookshop. ♦

VOLUME 0: X PROTOCOL REFERENCE MANUAL

Edited by Adrian Nye
O'Reilly and Associates
1995, 435 pages, Soft cover, high recycled content
ISBN 1-56592-083-X

Reviewed by John Chalk
DSI Pty Ltd
<john.chalk@datacraft.com.au>

This book is volume 0 in the well known O'Reilly series devoted to the X Window System, updated for X11 Version 4, Release 6.

Its aim is to provide a complete reference to the X Network Protocol. This refers to the underlying protocol, and not interface implementations or applications. If feel compelled to ask "why volume 0?", then this book is probably not for you.

The intended audience is server implementors, client-library programmers, and application programmers who want to increase their knowledge of the underlying principles and protocol.

My own experience includes administration of X terminals and supporting hosts, porting and support of X releases, and development of Motif applications, but not development of a server or of a client library.

The three major parts of the book are:

- conceptual introduction
- reference section with an entry for each protocol request and event
- 11 appendixes in a section describing various aspects in more detail

The first section, the introduction, provides an excellent comprehensive overview of the X architecture which would be of value to anyone working at any level with X. It goes on to describe a sample session, and implementation issues in more detail which will be of value

to implementors. The narrative style is not what one would normally expect of a reference manual, but the content is essential to an understanding of the X protocol and would not logically fit in any of the other library manuals in the series.

The second section is strictly a reference section with an entry for every request and event in alphabetic order. This section would only be of interest to an implementor of servers or library code, or possibly, someone debugging a session with a trace tool, or the simply curious.

The appendixes section provides more information on implementation details such as key symbols, errors, atoms, xlib to protocol mappings, bitmap distribution format, and so on.

Generally the book has been produced to the usual high O'Reilly standard. I believe that this book would be most useful, and indeed essential, to implementors of X servers, and writers of low level client libraries.

If you are an application developer, occasionally delving into Xt and Xlib, then your interface reference, combined with the Xt and Xlib references should meet most of your needs. If the budget is tight, then this book is not an essential. Having said that however, if your budget stretches to it, I could recommend the book solely for the introduction which provides an excellent overview which will be of value to anyone working with X. Some more specialised applications may require access to the references to BDF, interpretation of errors, or compound text encoding, for example. And of course in some quarters it is said that every comprehensive library should start with volume 0. ♦

STANDARD C: A REFERENCE

by P.J.Plauger and Jim Brodie
Prentice Hall,
1996, 248 pages + Diskette
ISBN 0-13-436411-2

Reviewed by Jamie Honan <jhonan@mpx.com.au>

This book does an excellent job of describing and explaining the C standard. It is particularly useful in explaining the newer aspects—the so called amendment 1—support for large character sets.

This is a reference book, you really have to know C to start with. Examples are only one or two lines to explain a point, they don't build into complete working programs.

The detail in this book is excellent, subtle points are brought out.

For example, did you know that if you write binary file, it may have a number of null bytes appended to the end? (Not under UNIX, of course!)

The syntax is explained with the help of "railroad diagrams", an excellent method of "finger tracing" correctness.

The book also has detailed descriptions of header files and standard library calls. These are arranged by header file name, not by individual function name. To find an individual function you must

consult the list at the end of the book for the relevant header file, then chase down that chapter.

This approach takes a little getting used to if you are used to manuals that list functions alphabetically, but means that like functions are grouped with relevant manifest constants (#defines to you and me) and with an overall explanation as a chapter introduction.

This is a very worthwhile book to have in your library if you program in C. The authors had a major role in the formation of the standard, they could hardly be more authoritative.

This book is particularly pertinent to "older" C programmers who may have an older K&R (Kernigan and Ritchie's "White Book") reference lying around but never updated. Particularly important is the wide character information, indispensable for writing a standard C program that will be used in Asian language environments.

The book comes with a diskette with the full book text in HTML (actually, the file names end in .HTM, you have to do a quick substitution:
`find . -name *htm -exec mv {} {}1 \;`
worked for me. Presumably the assumption is that UNIX people like working this sort of thing out for themselves).

While the diskette may be interesting, the handiness of the reference book can't be beaten. ♦

Digression: Book production values

When reviewing "Standard C—A Reference" I was unimpressed by the physical state of the book.

The first irritation is the (almost obligatory nowadays) diskette included. This little beast is glued to the inside back cover in a plastic sleeve. Presumably to deter thieves, the sleeve is stuck on in such a manner as to make removal almost impossible without wrecking the back cover.

The covers are almost paper thin, in humid air they curl badly.

Extracting the diskette, I put it aside for a while, inadvertently laying the diskette on the gluey plastic sleeve.

The pair, diskette and sleeve, then attached themselves to the next surface. My fault, I suppose, but then prying apart sleeve and diskette forced the metal slider off the diskette. Fortunately it was still readable.

The other "production value" quality which is lacking is editorial and layout control.

Whilst typography and layout are matters of individual aesthetic preference, the heavy use of bold font jarred on me.

Worse is the index. A good index is not simply the cleaned up output from a "grep". Many entries could have been culled as irrelevant, or at least, a "defined" tag would point the reader to the most pertinent reference.

One specific example of an indexing problem was the "precedence table".

This would be one of the most heavily consulted pages in a C reference manual. (let an old Kernigan and Ritchie "White Book" fall open and see what page is displayed).

The index? "Precedence of operator, see Operator, precedence of". Okay, that leads to page 92, a section on the meaning of operator precedence. Reasonable enough, but no "table" entry in the index. The table happens to be on page 96, so it's not too hard to find.

Books are expensive, and kept for some time. The modern trend in including poorly packaged diskettes and low production quality is annoying. ♦

UNIX INTERNALS: THE NEW FRONTIERS

by Uresh Vahalia
Prentice-Hall
1996, 601 pages
ISBN 0-13-101908-2

Reviewed by Warren Toomey <wkt@cs.adfa.oz.au>

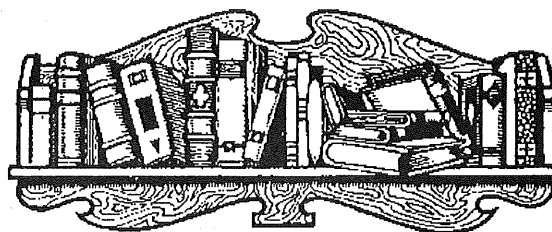
I've got most of the book on the design of the UNIX kernels: Lions' commentary on 6th Edition UNIX, Bach's book on System V, the black book on 4.3BSD and Goodheart & Cox's book on System V R4. Except for the last, all of these books cover historical systems, and all cover only a single UNIX system. It was a pleasant surprise to stumble across a reference to Vahalia's new book "UNIX Internals: The New Frontiers" on the 'net, and to get a copy of it.

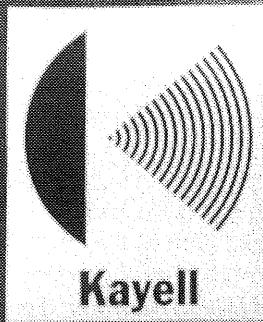
Unlike the previous UNIX kernel books, this one covers several systems which are currently in use: System V R4, Solaris 2.x, 4.4BSD, Mach 3.0, and Digital UNIX. Vahalia introduces each topic of kernel design clearly and logically, and describes the design and implementation of each of the systems without any bias. Each implementation's advantages and disadvantages are explained, which serves to remind us that any large software design involves compromises between such factors as speed, efficiency and resource usage.

The book is 600 pages long and the list of topics covered is enormous. Here are the top-level sections: Introduction and History, Processes and the Kernel, Threads and Lightweight Processes, Signals and Session Management, Process Scheduling, Interprocess Communications, Synchronisation and Multiprocessing, File System Interface and Framework, File System Implementations, Distributed File Systems, Advanced File Systems, Kernel Memory Allocation, Virtual Memory, The SVR4 VM Architecture, More Memory Management Topics, Device Drivers and I/O, Streams. If Prentice-Hall don't change their web server soon, the full table of contents can be found at <http://www.prenhall.com/013/101907/10190-7t.html>

This book is already slightly dated, with no reference to the latest version of 4.4BSD-Lite, the free BSDs which have enhanced 4.4BSD-Lite, nor Linux. Some of these systems, I admit, are moving targets. Although Linux is not descended from AT&T UNIX, its comparison with the other systems covered would make a useful addition. One large omission is any treatment of sockets and the network stack in BSD. This is probably due to the complexity of this subsystem and the fact that there are already several books which cover the design and implementation of this subsystem.

Vahalia's book isn't cheap either; my hardcover edition cost AUS\$85 from the Co-op Bookshop. However, it is lucidly written and very readable, and impartially compares the design and implementation of the flavours of UNIX currently in use. Therefore I would highly recommend "UNIX Internals: The New Frontiers" to anyone interested in delving into the design and implementation of today's UNIX systems. ♦





Look out

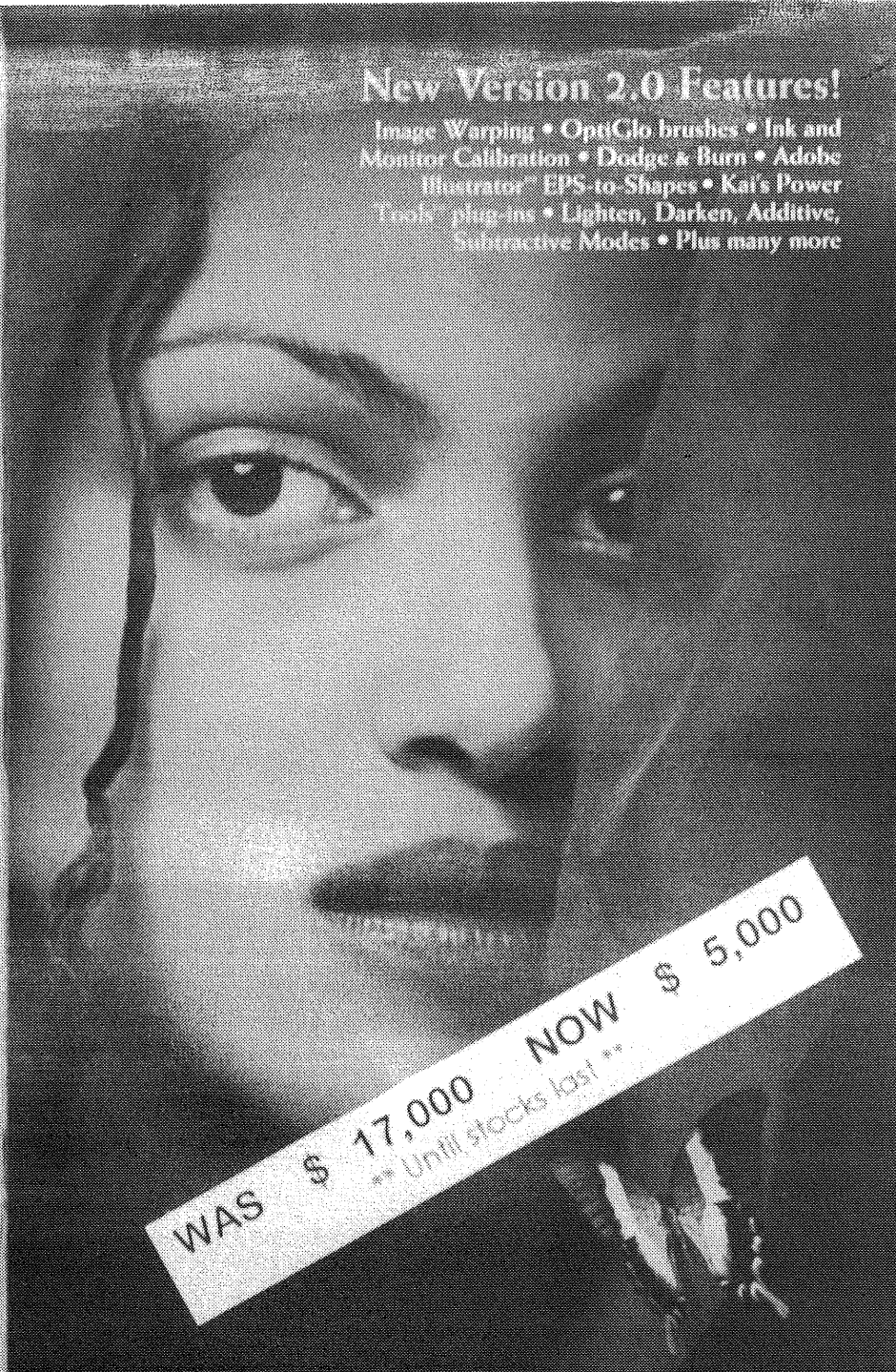
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From the Western Front

Edited by Tom Hallam <thallam@geol.uwa.edu.au>

Well I let things slip a bit over the last few months so I've got a bit of catching up to do.

We've had some excellent talks over the last few months. The meeting reports have been a bit sporadic but that should get better. If your talk has been missed then please accept my apologies, it has nothing to do with the quality of the talk. By the way, *anyone can put in a meeting report*; you do not have to be asked. If you liked (or disliked) a particular meeting then send me a report or just a paragraph saying what you thought about it.

WAUG members have been spawning processes (or should that be processors) left right and center. Congratulations to Janet and Glen for the birth of Samantha Dawn Jackson Huxtable. Samantha was born at 13:07 on Friday March 8th, and was 8lb 8oz and 50cm long. Congratulations also to Don and Ann for the birth of Jaydan Tony Griffiths. Jaydon was born at 09:09 on Saturday the 2nd of March 1996 and was 7 pound 7ounces and 50.8 cm long.

Last month was the AGM so we now have a new committee [see "Committee Contact Details" below]. I'd like to thank the old committee for their hard work over the last year. ♦

MEETING REPORTS

May Meeting

SECURITY GOOF-UPS

Given By: Don Griffiths

Meeting Reporter: Daniel Baldoni

Well, Don Griffiths has presented another entertaining and informative talk and once again the subject dealt with IT security. The title this time was "Security Goof-Ups" and the various anecdotes he used had the audience smirking, reaching for notepads or trying to look insignificant (depending on whether they knew the culprit, had the culprit working for them or were the culprit). Of course, Don didn't name names (so as to protect the guilty). Below are a couple of examples I've selected from Don's talk as being representative of some common security problem types.

We've all had problems with NFS in the past. Wondering why one OS supports NIS netgroups in an export list but another doesn't—that sort of thing.

But, the first story of the night discussed one enterprising SA who was using a UNIX server to provide home directories for PC's via PC-NFS. The upshot was that the single export he did was for the entire hierarchy to the world with write permission. That host was Internet connected. Luckily, it was Don who found it first.

One company had a stated policy that all employee user-ids were to be the same as the employee-id. So, our efficiency-conscious SA decided it would be quicker to blanket create accounts for all the current employees. Unfortunately, his add-user script also set the password for each new account to the same string (namely the employee-id). As if this wasn't bad enough, he then went on to publicise this in a company-wide newsletter. This is an example of how the best intentions can lead to possibly catastrophic breaches in security.

Then, of course, there's the simple typo. Consider the commonly used NIS passwd map entry:

```
+::0:0:::
```

What would happen if that leading '+' was missing?

The talk covered a number of other "types" of goof-ups, too many to discuss here. After Don finished educating us all, he threw the discussion open and several of us related stories of our own—be they computer folklore, or known to have happened where we worked (or worse, were committed by members of the audience). My own guilt precludes me from naming names or discussing deeds. ; -)

Everybody likes to think they can't make the simple mistakes which have serious impacts on service provision; but even the best systems support people are still human (although many of our users will dispute this) and therefore fallible (which many of our users will heartily agree to). When a mistake, poor planning or poor implementation leads to a problem; investigate, correct and document the problem, its causes and the actions taken to correct it. Your colleagues and your customers will later thank you (and it'll make your job easier in the long run).

After we'd all laughed at ourselves, WAUG held its '96 AGM. The various reports were accepted with little comment. We also held our committee elections, the results of which are included below [See Committee Contact Details].

Finally, the incoming committee members [and everyone else] would like to thank the outgoing members (several of whom have been voted back in this year) for their work over the last twelve months.

MEETING INFORMATION

WAUG meets at the Freeway Hotel, 55 Mill Point Road, South Perth. We meet at 6:15pm on the **third Wednesday of each month**.

Our meetings are advertised in the Diary column of the Computers section of Tuesday's *West Australian*.

If you need further information about the next meeting, please contact Mark or one of the committee.

SPEAKERS ARE NEEDED, especially ones who can actually commit to giving a talk on a certain date! So if you can give a talk, or know someone who can, please let us know. Mark (our meeting organiser) cannot produce them out of thin air. SAGE also needs speakers (See Local SAGE-AU below)

WAUG EMAIL ALIASES, NEWSGROUPS AND WEB PAGE

WAUG has the following mail aliases on uniwa.uwa.edu.au:

waug-membership
for membership enquires

waug-chair
our Chairperson

waug-meetings
our meeting organiser

waug-secretary
our Secretary

waug-newsletter
for newsletter contributions or enquires

waug
for general correspondence (will be read by the Secretary, as a paper letter would be).

So, for example, you may send general correspondence to waug@uniwa.uwa.edu.au.

Check us out on the World Wide Web at:
<http://www.auug.org.au/auug/waug/waug.html>
(thanks Canberra AUUG).

Also see the newsgroups wa.waug@aus.org.au for announcements and discussion.

COMMITTEE CONTACT DETAILS

Chair: Don Griffith 351 7691
griffith@cs.curtin.edu.au

Vice-chair: Luigi Cantoni 474 3700
lui@DIALix.oz.au

Secretary: Tom Hallam 380 2665
thallam@geol.uwa.edu.au
(AUUGN Sub-editor)

Treasurer: Patrick Ko 483 8111
pko@DIALix.oz.au

**Meeting
Organiser:** Mark Baker 491 6081
baker@telecomwa.oz.au

**Ordinary
Committee:** Daniel Baldoni
flint@cs.curtin.edu.au
(Meeting Reporter)

David Buck
dbuck@ncc.telecomwa.oz.au

Glenn Huxtable 328 8288
glenn@fs.com.au

Peter Wemm

FOR SYSTEMS ADMINISTRATORS: LOCAL SAGE-AU MEETINGS

The WA Regional Group of the Systems Administrators Guild of Australia (SAGE-AU)

meets on the **First Tuesday of each month at 6pm, in room G3 at the Alexander Library** If you manage computer systems for a living, we'd like to have you along.

SAGE-AU is **NOT** another UNIX group. All systems and network administrators are welcome. We would particularly like to see more PC network administrators attending, so if you know any, send them along. I'd like to see lots of Novell, NT, OS2 and MAC people attending.

For more information, please contact Don Griffiths <griffith@cs.curtin.edu.au>, (09) 351 7691 or myself, Tom Hallam <thallam@geol.uwa.edu.au>, (09) 380 2665. For information about SAGE-AU in general, you may also look at <ftp://ftp.sage-au.org.au/pub/SAGE-AU> and <http://www.sage-au.org.au:8080/>.

Canberra Chapter: June 96 newsletter

JUNE MONTHLY MEETING

When: 7:30 pm for 8:00 pm,
Tuesday, 11th June 1996

Where: Open Solutions Centre
15 Barry drive

What: Annual General Meeting,
Canberra Chapter

We need a quorum, so AUUG members please show up (all others are welcome to attend but note that only AUUG members can vote and only AUUG members can be elected to committee positions).

It looks like quite a few of the committee positions will be vacated at this meeting, so please put serious thought into standing for a position. If several people are keen the workload is not too bad, and we have put on some pretty impressive events (such as our summer conferences, special workshops and tutorials, and the Internet Project). Feel free to call anybody in the current committee to find out what the job involves. ♦

THE INTERNET PROJECT

If you are an AUUG member in the Canberra Chapter you can get e-mail and news access to the Internet, and there is no cost (so long as you remain a financial member). This is provided by a dialup service which has been recently updated and has a direct IP connection to the Internet. Full IP access to the Internet can be obtained at extra cost (\$90 for 300 hours, approximately). If you are interested in this service, please contact John Barlow (mobile: 019 935477) to have a chat about it.

We have a Linux box and a FreeBSD box available via the same dialup service, so if you want to examine these great (free, full source) UNIX implementations, here is a prime opportunity! Existing users who wish to use these boxes need to e-mail linux@canb.auug.org.au or freebsd@canb.auug.org.au to have an account setup.

MEETINGS ORGANISER WANTED:

If you want a specific topic discussed at a future meeting, or want a specific UNIX presentation made, please contact John Barlow (contact details at the end of this message).

COMING EVENTS:

June 11
Annual General Meeting

July 9
General Meeting (perhaps software protection?)

SECRETARY, CANBERRA CHAPTER OF AUUG INC.

John Barlow, 019 935477,
cauug.secretary@auug.org.au

AUUGN

is your journal!

Without you, there is no AUUGN: if you've knowledge to share, share it through AUUG's bimonthly journal.

You'll be reaching over 700 individuals, and more than 300 organisations involved in the UNIX/Open Systems world.

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

AUUG Institutional Members

as at February 1996

- AAIL
 ACAY Network Computing Pty.Ltd.
 Actrol Parts
 Adept Software
 Alcatel Australia
 Amalgamated Television Services
 Amdahl Australia
 Andersen Consulting
 ANI Manufacturing Group
 Ansett Australia
 ANSTO
 Anti-Cancer Council of Victoria
 ANZ McCaughan
 AT & T GIS
 Attorney-General's Department
 Ausnet Services Pty. Ltd.
 AUSOM Inc.
 AUSTA Electric Qld Minerals & Energy
 Centre
 Australian Archives
 Australian Bureau of Statistics
 Australian Centre for Remote Sensing
 (ACRES)
 Australian Customs Service
 Australian Defence Industries Ltd.
 Australian Electoral Commission
 Australian Film Television and Radio
 School
 Australian Information
 Processing Centre Pty. Ltd.
 Australian Medical Enterprise
 Australian Museum
 Australian National Audit Office
 Australian National University
 Australian Submarine Corporation
 Australian Taxation Office
 Australian Technology Resources
 (ACT) Pty. Ltd.
 Australian Technology Resources Pty.
 Ltd.
 AWA Defence Industries
 B & D Australia
 Barwon Water
 Bay Technologies Pty Ltd
 BHP Information Technology
 BHP Information Technology
 BHP Minerals Exploration
 BHP Research - Melbourne
 Laboratories
 BHP Research - Newcastle
 Laboratories
 Burdett Buckenridge & Young Ltd.
 Bureau of Meteorology
 Bytecraft Pty. Ltd.
 Cape Grim B.A.P.S
 Capricorn Coal Management Pty. Ltd.
 CelsiusTech Australia
 Central Queensland University
 Central Sydney Area Health Service
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 Cognos Pty. Ltd.
 Com Net Solutions
 Com Tech Communications
 Comcare Australia
 Commercial Dynamics
 Commercial Industrial
 Computer Services Pty. Ltd.
 Communica Software Consultants
 Composite Buyers Ltd.
 Computech Pty. Ltd.
 Computer Associates
 Compuware Asia-Pacific
 Continuum Australia
 Copper Refineries Pty. Ltd.
 Corinthian Engineering Pty. Ltd.
 CSC Australia Pty. Ltd.
 CSIRO Division of Information
 Technology
 CSIRO Division of Manufacturing
 Technology
 Curtin University of Technology
 Cyberdyne Systems Corporation Pty.
 Ltd.
 Cyberscience Corporation Pty. Ltd.
 Cybersource Pty. Ltd.
 Daedalus Integration Pty. Ltd.
 Data General Australia Pty. Ltd.
 Datacraft Technologies
 Dawn Technologies
 DB Bain Group Services Pty. Ltd.
 Deakin University
 Defence Housing Authority
 Defence Service Homes
 Department of Communications and
 the Arts
 Department of Conservation
 & Natural Resources
 Department of Defence
 Department of Defence (TC Section)
 Department of Education QLD
 Department of Family Services &
 Aboriginal & Islander Affairs
 Department of Gaming & Racing
 Department of Lands Housing & Local
 Government
 Department of the Treasury
 Department of Urban Services
 Dept. of Industrial Relations
 Employment Training & Further
 Education
 DEVETIR
 Dialix Internet Services27
 Digital Equipment Corp. (Australia)
 Pty. Ltd.
 Dominion Systems Pty. Ltd.
 DSTO Lab 73
 EASAMS (Australia) Limited
 Edith Cowan University
 Electricity Trust of South Australia
 Electro Optics Pty. Ltd.
 Engineering Computer Services Pty.
 Ltd.
 Environmental Resources
 Information Network (ERIN)
 Department of Environment Sport and
 Territories
 Equity Systems Pty. Limited
 Ericsson Australia
 ESRI Australia Pty. Ltd.
 Execom Consulting
 Executive Computing Group
 FFE / James Hardie Bldg. Serv.
 FGH Decision Support Systems Pty.
 Ltd.
 Financial Network Services
 First State Computing
 Flinders University
 Fremantle Port Authority
 G.James Australia Pty. Ltd.
 GEC Alstom Information Technology
 Genasys II Pty. Ltd.
 Great Barrier Reef Marine Park
 Authority
 Haltek Pty. Ltd.
 Hamersley Iron Pty. Ltd.
 Hannan Group Computer Services
 Heath Insurance
 Hermes Precisa Australia Pty. Ltd.
 Hitachi Data Systems
 Honeywell Australia Ltd.
 Honeywell Ltd.
 Hong Kong Jockey Club Systems
 (Australia) Pty. Ltd.
 I.P.S Radio & Space Services
 IBM Australia Ltd.
 Ideas International Pty. Ltd.
 Independent Systems Integrators
 Informatel Online
 Information Technology Consultants
 Insurance & Superannuation
 Commission
 Integration Design Pty. Ltd.
 Intelligent Network Development
 James Cook University
 Joint House Department
 JTEC Pty. Ltd.
 Keays Software
 Knowledge Engineering Pty. Ltd.
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Labtam Australia Pty. Ltd.
Land Information Centre
Land Titles Office
Leeds & Northrup Australia Pty. Limited
Logica Pty. Ltd.
Lotus Development
Lyons Computer Pty. Ltd.
Macquarie University
Main Roads Western Australia
Mayne Nickless Courier Systems
Mayne Nickless Information Tech. Services
Medical Benefits Funds of Australia Ltd.
Memtec Limited
Mentor Technologies Pty. Ltd.
Mercedes-Benz (Australia) Pty. Ltd.
Message Handling Systems
Metal Trades Industry Association
Mincom Pty. Ltd.
Minenco Pty. Ltd.
Mitsubishi Motors Australia Ltd.
Mitsui Computer Limited
Moldflow Pty. Ltd.
Motorola Communications Australia
Motorola Computer Systems
Multibase Pty. Ltd.
Multiline BBS
National Library of Australia
National Resource Information Centre
NCOM Services
NEC Australia Pty. Ltd.
Northern Territory Library Service
Novell Pty. Ltd.
NSW Agriculture
NSW Teachers Federation Health Society
Object Design Pty. Ltd.
Object Technology International Pty. Ltd.
Office of the Director of Public Prosecutions
Open Software Associates Ltd.
OPSM
OSIX Pty. Ltd.
Pacific Star Communications
Peter Harding & Associates Pty. Ltd.

Petrosys Pty. Ltd.
Philips PTS
Port of Melbourne Authority
Powerhouse Museum
Primary Industries & Energy
Process Software Solutions Pty. Ltd.
Prospect Electricity
Pyramid Data Centre Systems
Qantek
QLD Department of Transport
Quality By Design Pty. Ltd.
Redland Shire Council
Renison Golffields Consolidated Ltd.
Rinbina Pty. Ltd.
Royal Melbourne Institute of Technology
SCEGGS Redlands Ltd
Sculptor 4GL+SQL
Security Mailing Services
SEQEB Business Systems
Siemens Nixdorf Information Systems Pty. Ltd.
Smallworld Systems (Aust.) Pty. Ltd.
Snowy Mountains Authority
Software Plus (Australia) Pty. Ltd.
South Australian Co-operative Bulk Handling
Specialix Pty. Ltd.
St. Gregory's Armenian School
St. John of God Hospital
St. Vincent's Private Hospital
Stallion Technologies Pty. Ltd.
Standards Australia
Stanilite
State Library of Victoria
State Revenue Office
Steelmark Eagle & Globe
Sterling Software
Storage Technology of Australia
Sydney Electricity
Sydney Ports Corporation
Systemk Corporation Pty. Ltd.
Systems Development Telecom Australia
TAB Queensland
TAFE NSW Information Systems Division
Tandem Computers

Tattersall Sweep Consultation
Technical Software Services
TechNIX Consulting Group International
Telecom Australia
Telecom Payphone Services
Telstra Applied Technologies
Telstra Research Laboratories
The Far North QLD Electricity Board
The Fulcrum Consulting Group
The Roads & Traffic Authority
The Southport School
The University of Western Australia
Thiess Contractors Pty. Ltd.
Thomas Cook Ltd.
TNT Australia Information Technology
Toshiba International Corporation Pty. Ltd.
Tower Technology Pty. Ltd.
Tradelink Plumbing Supplies Centres
Transport Accident Commission
Triad Software Pty. Ltd.
Unidata Australia
University of Adelaide
University of New South Wales
University of Queensland
University of South Australia
University of Sydney
University of Tasmania
University of Technology Sydney
Vanguard Computer Services Pty. Ltd.
Victoria University of Technology
VME Systems Pty. Ltd.
Walter & Eliza Hall Institute
Water Board
WCS Australia Pty. Ltd.
Wesfarmers Limited
Western Mining Corporation
Westrail
Woodside Offshore Petroleum
Workers' Compensation Board of QLD
Workstations Plus
XEDOC Software Development Pty. Ltd.
Zircon Systems Pty. Ltd.

MEMBERSHIP APPLICATION

INDIVIDUAL



UNIX® AND OPEN SYSTEMS USERS

To apply for AUUG membership, complete this form and return it with payment in Australian Dollars to:
**REPLY PAID 66, AUUG MEMBERSHIP SECRETARY,
 P.O. BOX 366, KENSINGTON, NSW 2033, AUSTRALIA**
 Tel: +61 2 361-5994 or 1 800 625 655 • Fax: +61 2 332-4066

Tick this box if you wish your name withheld from mailing lists made available to vendors.

NOTE: Please do not send purchase orders - perhaps your purchasing department will consider this form to be an invoice. Foreign applicants please send a bank draft drawn on an Australian bank.

INDIVIDUAL OR STUDENT MEMBERSHIP:
 I, _____ do hereby apply for:

Renewal/New membership of AUUG \$ 90.00
 Renewal/New Student membership \$ 25.00 (please complete certification portion)
 International air mail \$ 60.00

I 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/renewal until the end of the calendar or financial year.

TOTAL REMITTED: AUD\$ _____ (Cheque, or money order, or credit card)

Signature _____
 Date _____

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

To BETTER SERVE YOU, PLEASE PRINT YOUR CONTACT INFORMATION:

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

STUDENT MEMBER CERTIFICATION: (to be completed by a member of the academic staff)
 I, _____ certify that
 _____ (administrator) is a full time student at
 _____ (name) and is expected to
 _____ (institution) graduate approximately _____ (date).

Signature _____
 Title _____ Date _____

Over for Institutional Membership

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.

MEMBERSHIP APPLICATION

INSTITUTIONAL



UNIX® AND OPEN SYSTEMS USERS

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Tick this box if you wish your name withheld from mailing lists made available to vendors.

NOTE: Please do not send purchase orders - perhaps your purchasing department will consider this form to be an invoice. Foreign applicants please send a bank draft drawn on an Australian bank.

We, _____
(Company Name)

do hereby apply for:

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

TOTAL REMITTED AU\$ _____

(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/renewal until the end of the calendar or financial year.

We understand that we will receive two copies of the AUUG newsletter, and may send two representatives to AUUG sponsored events at member rates, though we will have only one vote in AUUG elections, and other ballots as required.

Signed _____ Date _____

Title _____

INSTITUTIONAL MEMBER DETAILS:

To be completed by institutional members only.

Following are our specified contacts. The primary contact holds the full member voting rights. The two designated reps will also be given membership rates to AUUG activities including chapter activities. By default a regional chapter will be selected for you. If you would rather nominate a chapter, please specify in space provided (indicate NONE for no chapter). (Please print clearly or type)

Primary Contact _____

Position/Title _____

Address _____

Postcode _____

Bus. Tel: _____ Bus. Fax: _____

e-mail address _____

Local Chapter Pref. _____

1st Rep. _____

Position/Title _____

Address _____

Bus. Tel: _____ Bus. Fax: _____

e-mail Address _____

Local Chapter Pref. _____

2nd Rep. _____

Position/Title _____

Address _____

Bus. Tel: _____ Bus. Fax: _____

e-mail address _____

Local Chapter Pref. _____

Please charge \$ _____ to my

Bankcard, Visa, Mastercard

Account number: _____

Expiry date: _____

Name on card: _____

Signature: _____

AUUG 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) 332-4066 or post it to:

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



(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 # _____

