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Press Release:

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Editorial

Günther Feuereisen
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It's conference time! You should all be reading this during, or just after the Winter Conference. A special thanks to all of our sponsors for their support of AUUG and our yearly conference.

It's been a busy couple of months: the Microsoft Trial, the ever increasing momentum in the use of Open Source and the rise and rise of the popularity of free OSes.

Linux seems to be soaring. For those of you who are new to Linux and live in Adelaide, LinuxSA and AUUG are hosting the LinuxSA Installfest in mid-July. Check out pp10-11 or the website `www.linuxsa.org.au/meetings/installfest2000` for more details.

The popularity of UNIX-like Operating Systems just seems to grow and grow. I remember reading an article in 1993 when NT 3.1 was released, the cover of the magazine proclaimed that "UNIX is dead!"

Look around you. It's Y2K; UNIX is everywhere! Between the established vendors (Sun, SCO, Compaq, HP, IBM, SGI etc.), the free BSDs, the Linuxes .. and Microsoft facing an anti-trust ruling which will divide them into two, you'd have to wonder – for an OS that is supposed to be dead, UNIX is making a lot of noise.

Maybe Ken and Dennis knew something the world didn't? ;-)

See you next time.

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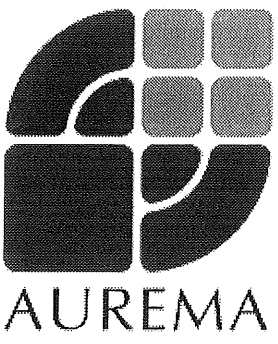

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Volume 21 • Number 4 – November 2000:	**October 17th, 2000**
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President's Column

David Purdue
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growing pains *n.pl.* 1 early difficulties in the development of a project etc. 2 neuralgic pain in children's legs due to fatigue etc.
- *The Pocket Oxford Dictionary*

It would appear that Linux has hit the big time. As we are all aware, it is being deployed ever more widely and on a greater variety of systems. Hands up if you have a Linux box of some kind in your work place!

In the press the stories we are seeing are less hype and more real solutions to business problems and technical challenges. Several large hardware vendors seem to have bet the farm on Linux's long-term success, and how many Linux-based company floats have we seen in the last year?

One thing this success has lead to is a plethora of Linux "distributions" – different packaging of the Linux kernel with utility and other software. A quick (and I mean quick) search of the net showed up at least 50 different Linux distributions.

Each of these distributions is a little different. They have to be to justify their existence in a particular niche. Some exist to provide commercial grade support. Some have a wider set of applications bundled with the kernel. Some aim to be the easiest to install and administrate. Some aim to be the smallest operational set. Some address particular hardware platforms. Some exist just so that the developers can reap some reward for the work they are putting in to Linux development.

Is this a bad thing? Not at all. The abundance of distributions means there are people who are working on different areas of the O/S technology, experimenting with different ways to take Linux forward. And since the GNU Public Licence covers pretty much all the distributions, a good idea developed in one distribution can rapidly be adopted by the others. Specialist needs are catered for, but innovation for the whole of Linux is encouraged.

Not that this is without problems. It should be noted that in today's commercial world, computers exist because of the applications run on them and not the other way around. As noted above, all the Linux distributions differ from each other to a greater or lesser extent – if they did not there would be no point to their existence. And although all the distributions are based on the same Linux kernel, these differences can affect applications, since they affect how applications are installed, file systems layouts, what operating system facilities can be assumed to exist, and even the API's available. This creates difficulties for software vendors (ISV's), who do not have a single target to port to.

I should hope that a number of AUUG members should be experiencing déjà vu at this point. Surely this is the same difficulty faced by UNIX programmers and the multiple, subtly different environments offered by different vendors and their versions of UNIX.

I think history has shown that there are two approaches to this problem.

One is the monopoly – this is the Windows NT model. When all the world is running one operating system from one vendor then it is really easy for ISV's to choose a target to port to. However, as has been found by Judge Thomas Jackson, this stifles innovation, and the consumer suffers.

The other approach is to adopt standards, so that an application can rely on certain operating systems features, installation procedures and API's to be present. Standards should be well understood, widely available and easily obtained. Does this not also stifle innovation? Maybe to some extent, but there is still room to come up with better implementations that adhere to the standard, and for niche operating systems that cater to particular needs. Effectively there is just a single platform to port to, as far as ISV's are concerned.

I hope the Linux community will learn a lesson from UNIX history and embrace open standards.

Linux standards efforts are just one topic that is to be discussed at the up coming AUUG2K conference, "Enterprise Security, Enterprise Linux," being held in Canberra in June. Check out `http://www.auug.org.au` for more details.

BLOAT, PART DEUX

I was going to leave this where it lay after the last issue, but I just can't help it...

I recently attended the launch of Microsoft Windows 2000.

I think other media have dwelled enough on the main anomaly of this presentation: Two months ago Windows NT was a stable and reliable operating system capable of supporting all your mission critical applications. Now that Windows 2000 is on the market, Microsoft has revealed that in their labs Windows NT crashes after 5.2 days of operation.

In any case, I saw many other curiosities in this presentation.

I think they got me offside straight away when Bill Gates appeared on the large screen and said, "Hello Australia and New Zealand!" What's the matter, Bill? Are you so busy you could not spend an extra 10 seconds to do another take?

"Hello Australia!" "Hello New Zealand!" How long was that?

I was also annoyed by the folks interviewed from Australian companies that have already deployed Windows 2000. Most of them had American accents, and of the others a lot had British accents. Are Australians not suitable for senior technology jobs? Or are we just too sensible to deploy Windows 2000 before its release?

In any case the main message of this launch, as seems to be always the way with Microsoft, is that bigger is better. And to prove that Windows 2000 is bigger some amazing numbers were flashed on to the big screen.

For starters, it was revealed that 5000 programmers worked on the project. If that impresses you, then you have not read that seminal work on software engineering "The Mythical Man-Month" by Frederick P. Brooks. He shows that for tasks with complex interrelationships, a point is reached where adding more people will actually lengthen the time required or detract from quality of the final product.

But the statistic that nearly made me fall off my chair was that the Windows 2000 developers sent themselves 90,000 emails a day. Why do I need to know this? I fail to see how this information tells me anything about the quality of the end product. Let's see – that is 18 email's per programmer per day, and lets assume an email takes 5 minutes to compose and 5 minutes to read, then each programmer was spending 3 hours a day on email! Could this time have been spent more productively, say, on testing and debugging?

Bigger is not better, but even after the tidal wave of Linux and the number of NT file and print servers that have been replaced with Linux/Samba file and print servers Microsoft just does not get it.

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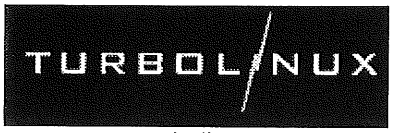

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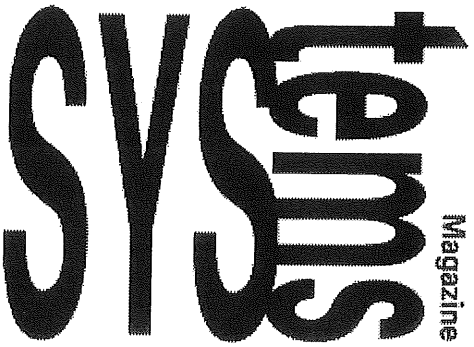

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Review:

IETF Seminars

David Newall
davidn@rebel.net.au

The IETF -- The Internet Engineering Task Force, who are the people who design the internet protocols -- are meeting here in Adelaide this week. This is a rare occurrence, and Glen Turner, who is one of Adelaide's network gurus, has organised a real treat for us to enjoy. He has asked some of the IETF members -- who are experts in their fields --- to present a series of lunchtime seminars.

INTERNET 2

Presented by E. Paul Love,
Chair, Internet2 Topology Working Group.

Monday, 27 March 2000, 1pm - 2pm
Horace Lamb lecture theatre
Horace Lamb Building
The University of Adelaide

The first seminar, on the topic of Internet 2, was presented by E. Paul Love, who is chair of the Internet2 Topology Working Group.

I gained the understanding that Internet2 is a high speed, IPv6 based network. The primary users are USA academic institution, although both private companies and international organisations are also connected. The purpose of the network is to research high speed networks and applications that can benefit from them.

The network is a series of "gigapops" usually connected by high speed links. Some isolated areas have been (or still are) limited by relatively low links; although since apparently "low speed" is measured in multi-megabits per second I have little sympathy for them!

Internet 2 exists through the generosity of various commercial and governmental gifts, for example equipment vendors donate equipment, and long distance carriers donate bandwidth. It seems that a very few carriers provide most of the physical links. [I wonder if it's a good thing to have important research infrastructure at the mercy of a telco's good will?]

Latency (the time it takes for data to cross the network) is an important issue. In one application a tunnelling microscope (I think) cannot be controlled from further away than 900 miles: beyond that distance the commands to control it take so long to traverse the network that the device can slam into the sample. An analogy was made to remote-medicine, with a surgeon "holding" a remote scalple!

Another application that takes advantage of Internet 2 is remote control of radio telescope. Scientists traditionally have to book time on large telescopes, and fly there when their time is scheduled. Now they can avoid the expense of travel and control the telescope over Internet 2.

The only negative comment I would make is that too much time was spent on the physical infrastructure of Internet 2. Never the less we were presented with some good insight into future directions of the Internet.

TELEPHONY OVER IP

Presented by Stephen Kingham, CSIRO

Tuesday, 28 March 2000, 12pm - 1pm
Flentje lecture theatre
Plaza Building
The University of Adelaide

The second seminar, on the topic of Telephony over IP, was presented by Stephen Kingham from CSIRO (apparently, although I thought I saw Don Robertson written on the blackboard so my humble apologies if I got it wrong!)

The good news is it's all surprisingly easy!

Normally your telephone is connected to your company PBX, which places the call using the public telephone network (PSTN). With VoIP you PABX is connected to a "Voice over IP" gateway, which looks almost like another PABX or like a telephone line. On the PABX side the gateway looks like ISDN; on the internet side it uses H.323 (the standard for voice over IP.) When you wish to make a call the PABX passes your call to the VoIP gateway which connects to a gateway "at the other end", which makes a (presumably) local call to complete the circuit (or delivers it to a local extension.) Calls can also be placed to "IP telephones", for example Microsoft Netmeeting.

If the gateway cannot place the call the PABX falls back to the usual (expensive) PSTN.

Software called "Gatekeeper" translates a telephone number into an IP address. This is analogous to the DNS which translates a domain name into an IP address, but unlike the DNS, which must be manually configured, you can connect to your local Gatekeeper and it knows that's where you are. I gathered that Gatekeeper is not quite "production ready", and that static routes are also used.

Each voice call is sampled at 64Kbps and compressed using G.some number, which standard describes the compression of speech. This compresses speech to a bit rate of 8Kbps. Allowing for system overheads, each call actually consumes 26Kbps! I think the protocol sends 60 bytes of data per packet, and when you add

UDP headers, and IP frames, the overheads greatly exceed the amount of data! [It's ironic that the argument against IP on ATM is the penalty of splitting IP datagrams into lots of little ATM cells.] On slow links (less than 2Mbps) further compression is used which brings the bandwidth down to 13Kbps. I remember the number 5Kbps being bandied around, too, but I don't recall how.

VoIP requires data to be delivered quickly and reliably. If the packets are delivered in less than 200ms the quality is about the same as for the normal telephone network. Delays up to 600ms (I wish I wrote these numbers down) are like talking over a satellite link; you need to talk, then pause to let the other person talk. When you add up how long it takes to convert speech to data, and to so and so forth, until it gets to the other end, the total time is about 90ms plus trip time, which just about makes VoIP to USA workable.

If the packets cannot be delivered quickly, there's no point delivering them at all. VoIP uses the IP Type of Service field to identify the voice data so that routers can give them high priority. Only authorised hosts are permitted to set the TOS and the gateways strip these bits from IP headers from unauthorised hosts.

There are issues relating to network performance, and if the network is too busy to handle the call it should be rejected (and the PABX should fall back to the expensive PSTN line.) This is apparently another "work in progress" issue, the final solution to which is still being worked out.

AARNet is using this service now. It supports voice and fax. Fax works by using DSP (digital signal processors) to decode the fax signal and turn it back to data; the data is sent through the network and turned back into "fax" at the other end. Modem calls are not support (although there is no reason why they couldn't be handled the same way fax is) and neither is ISDN video. [Pooh!]

One lovely benefit is end-to-end Q.sig, which the government has been unsuccessfully trying to get carriers to support for years. Suppose you try to call somebody and they are on a call. Q.sig allows you to dial a code and hang up, and when their call completes your telephone rings. When you pick it up their telephone rings and you are thus connected to them. This feature is available on PABXs, but it's not available over the PSTN. VoIP gives you this ability end to end.

Billing is really easy. A billing system was written in Perth, and I we were told the URL, http://timtam.aarnet.edu.au. The system currently handles thousands of calls per day. Long distance calls using VoIP cost around 1/10th of a cent per minute; much cheaper than the PSTN.

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Welcome to LinuxSA's and AUUG's installfest!

What is an installfest? Well, an installfest is where members of the local Linux community come together and offer their time and expertise to help you install and configure Linux on your computer.

In addition to helping you install Linux we'll also be helping those of you who already have Linux installed, but need help configuring something - whether that be peer-to-peer networking, dialup internet access, Linux-to-Windows connectivity, or just getting Quake III running well!

Perhaps you don't know what the fuss about Linux is all about. Feel free to come along and have a look (why not bring your machine - you might change your mind and want Linux for yourself! :-) You can check out some of the following on-line resources to find out what Linux actually is and to learn more about what makes it great!

So come along, bring your computer, join us for a slice of pizza and get Linux installed and running smoothly on your computer. Join the growing crowd of people who won't accept software that sucks.

When, Where and What?

The installfest will be held on **Saturday July 15th** at 31 York Street, Adelaide. We'll be opening the doors to the public at 10am and we won't start any new installations after 4pm.

Where is 31 York Street? Well, going down Rundle Street, you'll find Bent Street (just between Ngapartji and the Austral Hotel). Half-way down Bent Street you'll find a laneway called York Street. There is an Anima Gallery sign clearly visible, under which is a door into a room which contains a lift. Taking the lift to the second floor, you'll find us there on the left! Think you'll get lost? Then have a look at some photos [`http://slash.dotat.org/~newton/installfest/`] with directions showing you how to get there.

There's plenty of parking available in either the Hungry Jacks Car Park or the Target carpark across the road, and there will be volunteers in York Street directing traffic and helping people unload their machines. **There may be an announcement concerning parking - so watch this space for further details.**

What will we be installing? As our very generous sponsors Red Hat and TurboLinux are donating CDs, we will preferably be installing these Linux distributions. If you want something else, we certainly will have other Linux distributions available (as well as FreeBSD, another open-source operating system), but if you are new to Linux, we recommend either of these two distributions since they are easy to use, very stable and able to be supported by the LinuxSA community.

Requirements

Before the day you'll need to do the following:

- Make sure you have at least 400Mb of disk space free for Linux. If you want to keep your pre-existing Windows installation, that's ok, we can set up your computer so you can dual-boot between the two

OSes, but you should defragment your hard drive under Windows before you come to save some time.
- Backup your data - particularly if you can't afford to lose it.
- Register [http://www.linuxsa.org.au/meetings/installfest2000/register.php3]. You should let us know that you're coming.
- Label everything that you're going to bring with you - that way there's no confusion about what belongs to who.

You need to bring the following with you:

- Your PC - only 486s and later please :-) We can install on Sun SPARCstations, DEC Alphas and Apple Macintoshes as well - but you'll need to forewarn us if you intend bringing any of these.
- Your monitor & modem - afterall, if you want everything to work at home, let's make sure it works here before you leave.
- Other devices - mice, keyboards, scanners, printers, anything you want working under Linux.
- Cables - we can't possibly provide all possible cables and connections, so bring your own. Perhaps put them all in a box with your name on the side and bring that. Bringing your own powerboard is a good thing to do.

Cost

Zip. Zero. Squat. Absolutely nothing. We'll be installing only open source software that is freely re-distributable, so there's no cost to you for the software.

We'll also have refreshments on offer (including pizza :-) for a reasonable cost. There will also be merchandise such as non-free software, books, Linux merchandise etc. for sale on the day by various retailers.

Sponsors

Even though the software we'll be installing is itself free, there are costs associated with running an event like this.

LinuxSA gratefully acknowledges the generous assistance given by the following organisations, without which this event could not take place:

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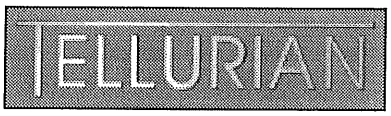

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Want more information?

Check out the LinuxSA Installfest website:

www.linuxsa.org.au/meetings/installfest2000

Review:

Probes, Logs and Things That Go Bump in the Night

Daniel Baldoni
dbaldoni@iinet.net.au

[Editor's Note: our thanks to Daniel for giving us permission to publish his review in AUUGN.]

This month the WA chapters of AUUG and SAGE-AU got together with PLUG (the Perth Linux Users' Group) to hold a special meeting. We were fortunate enough to have David Conran from AusCERT (the Australian Computer Emergency Response Team) give us a talk entitled "Probes, Logs and Things That Go Bump in the Night".

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The first question David covered was:

What is a probe?

He described it as:
- a "knock on the door" or "rattling of the windows" of your firewall;
- a precursor to being hacked;
- a good indication that the source site (of the probe) has been compromised

and
- costing you bandwidth.

How often do they happen?

Apparently, this can depend on:
- how big your site is;
- how large your DNS is (check who you allow zone transfers to);
- how visible your site is; and
- whether or not you're unlucky enough to be the default settings in some program.

David then told us that only about 1 in 1,000,000 IPs scanned are ever reported.

[Author's note: Having a particular interest in computer and network security, I've seen this type of behaviour before but I was still surprised at the scale of the failure to report.]

How often are the probes successful?

David said that if you're checking your logs, then you're probably okay. Back to statistics ... about 8% of compromises are reported.

At this point, David was asked how they (AusCERT) "knew" these numbers were accurate. His response was "from the logs of compromised sites". When other (either "upstream" or "downstream") sites were contacted, note is taken of who had been compromised and whether or not they had reported the fact. He then went on to emphasise that these statistics are only for Australia and that AusCERT considers them to be very optimistic.

Okay, so who's doing the probing?

David listed a number of groups:
- "script kiddies" : Children (as young as pre-teens) who have a point-and-click program and they get a '#' prompt at the end of the process. They have no idea what it is they've done or what they now have access to.
- "chat room groupies": People who use ICQ or IRC (or whatever) and like to wage war over something said in a chat-room.
- "suits": Those who are deliberately (and professionally) engaged in this type of action (can you say "corporate espionage"?).
- Broken devices and programs, or devices and programs with bad default settings. As David indicated, we've all seen print servers or SNMP agents which like to "discover" the entire Internet address space.
- Governments attacking other governments. All that was said on this point was, "yes, we've seen it happen".

So, why don't people report these probes when they happen?

The reasons given were:
- too much effort
- so many
- don't know what to do about them
- we don't look at the logs
- what's the point?
- somebody else will

Okay, given all those "perfectly valid" reasons, why should network probes be reported?

- It lets other sites know; they may have been compromised as nobody is going to try breaking into a site from their own. This may be how you discover you've been compromised!
- No-one else will (just read the previous list!).
- Was it just your site? You don't know if it was part of a larger scan. If the source site gets 20 reports from 20 different sites, they're far more likely to take it seriously than if they only get one.
- It may be something new, meaning you may be the first to have detected it.
- Tracing back allows cleanup of other affected sites.

- It may help in a legal case. A large number of reports destroys the "I did it by accident" defense.
- It may help agencies get funding or other resources to deal with this type of crime.

How can these probes be detected?

Obviously, through firewall and system logs.

Also, check logs for things like "TCP wrappers" (e.g. `tcpd`, `tcp_wrapper`). David then stressed the need to keep your logs synchronised and your various sytems' times accurate. Then, combining some of your logs when analysing them may highlight attacks you weren't aware of. The example David gave was combining your firewall logs with your `sendmail` logs ... if you suddenly see mail failures one minute after noting a probe in your firewall logs, some kind of attack was made. He also pointed out that automated checking can be very useful, particularly if you have large logs.

So you've decided to report a probe; how do you go about it?

The first thing David stressed was to contact the right person. Also, be polite when dealing with them. Remember that they may be madly running around trying to clean up a compromised system (consider how you'd be feeling if you were in their situation). Provide them with clear and concise data, complete with your time zone and the date of the probe (as they may not get around to handling your query for a couple of days). Also, provide them with contact information so that they can check this isn't just a hoax "call". Finally, you could partially automate the process by using a pre-generated form letter. Or, you could go for a fully automated system which examines your logs, and automatically fires off an appropriate message to the site(s) concerned.

As mentioned above, it's important to contact the right person at the source site. But, who is that? You could try the "standard" addresses of root, postmaster (required by RFC 822) or abuse (required for ISPs) at the appropriate domain. You could also scan the relevant organisation's website as they may have a designated security contact. The whois database contains Technical and Administrative Contacts for every domain. These may be out of date but the indicated people should know who the currently relevant person is (and how to contact them). Next, check the SOA field in the site's DNS as it should provide a contact email address for network-related issues. Finally, report it to the CERT team in the area of the source site; they may even be able to translate for you if necessary.

Why report it to CERT?

- People take notice if an external organisation is making an investigation.
- CERT sees other reports and can let a site know that this is not an isolated incident (again, this is more likely to induce action).
- They have experience in this and know how to take it further.
- They can provide more evidence and "clout" in follow-up action.
- CERT have a larger scope of activities; they can see the "overall picture" and allows them the benefit of strategic planning.
- They produce alerts and advisories to the "general populace".
- It reduces your workload as they do the work of investigating (or "chasing down") the incident - but only if you're a member.
- It makes you feel good as you're helping out.

At this point, one of the attendees asked why the advisories were so late (in comparison to information avenues like "bugtraq"). David then described AusCERT's need to thoroughly verify any reports made to them. As they're a trusted source of information, they must be seen to produce accurate synopses of and, where possible, "cures" for the problems reported to them. This often requires them to deal with hardware or software vendors (for patches, upgrade information, etc.) and this can lead to delays.

Fine, so you've decided to report a probe; how do you report it to AusCERT?

The e-mail address you should use is `probe@auscert.org.au`. When reporting probes, David requested that you:

- use the source's IP address rather than FQDN as it avoids the "it wasn't us - it's probably a spoof" response;
- provide a separate report for each source IP address;
- don't send your entire firewall logs in a single message, but break them up based on source IP address;
- `CC:` the message to the offending site;
- use a good `Subject:` line (e.g. avoid things like "FYI");
- send logs in plain text (screen dumps of logs aren't too useful) and in English;
- keep messages short and the most useful information at the start of each message (so readers don't have to wade through logs to find a synopsis of the situation); and
- provide updated information if and when it becomes available.

He also asked that you indicate whether or not any of the information you have provided can be passed on or must be kept confidential. By default, everything sent to AusCERT is considered confidential and won't be passed on. However, it may prove helpful if some parts of the information (e.g. logs with IP addresses masked out). can be passed along to other authorities.

Now that AusCERT has your reports, what do they do with them?

The reports are tracked and correlated (which helps in locating patterns of attack and in the development of that strategic planning mentioned earlier). They can then take it further with police and other organisations both in Australia and overseas.

If you have a situation which is more serious than "just a probe", you can e-mail the details to auscert@auscert.org.au. If the problem is "really serious", you should PGP encrypt the message (AusCERT's key is available from their website).

Now, back to the statistics.

In March 2000, almost 700 incidents were reported. 580 of these were network probes and about 50% of those indicated that sites had been compromised. Approximately 337 sites in Australia were compromised during that month (or, about 11 were compromised each day). Extrapolating from our earlier statistics (these are only reported numbers), 580,000,000 sites were probed during the month of March. David pointed out that this equates to every IP address being scanned every 4 days.

Finally, how can you protect yourself from these probes?

David gave a list of AusCERT's "top 10" targets for March. These were, in order:

1. portmapper
2. WWW - php, phf, etc.
3. telnet
4. NetBIOS
5. 8080 and other proxies
6. IMAP
7. POP3
8. POP2
9. TCP 3128 (Squid)
10. DNS

You should also follow these general rules:

1. Keep your systems and filters up-to-date.
2. Install a firewall and use egress filtering (to keep information inside your own network and to prevent you from becoming a "default-based prober").
3. Implement host-based security to provide an additional layer of protection between you and the attacker.
4. Monitor your logs and report on them.
5. Keep yourself up-to-date with security related issues.
6. Don't become complacent.

Lastly, David introduced his "rule of 9s".

If you have a firewall, you're probably 90% secure. If you also have host-based security, you're probably 99% secure. If you have also been applying system and software patches, then you're probably 99.9% secure. At 99.9% secure, and approximately 600 incidents per month, you will probably have a security incident every two months.

This evening was the first in what the various WA chapter committees hope will be a series of such seminars. To those of you who couldn't make it to this one, we hope to see you at a future event.

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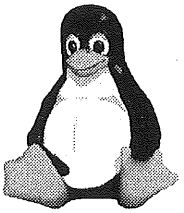

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The 2000 annual John Lions' student award for work in the area of open systems.

The John Lions award has been instituted to recognise the leading role that John Lions played in bringing UNIX to Australia, the formation of AUUG, and the promotion of the values held by the open systems community.

After Ken Thompson and Dennis Ritchie published a paper "The Unix Time-Sharing System" in May 1974, John Lions decided to base his Operating Systems course around understanding the source code. In addition to that, he founded AUUG as a group of computer scientists who had a common interest in the UNIX Operating System.

Today AUUG has members throughout Australia from industry, commerce, and education and works to promote the benefits of open architectures and standards compliance in languages, operating systems, networks, and applications. AUUG focuses on the latest developments in open systems by the exchange of ideas and solutions through local chapters, the annual conference, local chapter conferences, and its journal.

Requirements:

- The award is for a full time student at an Australian University.
- The award is for an in-progress or recently completed honours or postgraduate thesis in the area of UNIX and open systems. The judges will be looking for things like interesting uses of open systems technology, contribution to understanding of open systems, programs, tools or knowledge about UNIX and open systems.
- The award is judged on the basis of an approximately one page or 500-word description of the work. The evaluation committee may wish to interview students on the short list for the prize and possibly see a demonstration of the work so far completed.
- The evaluation committee will consist of at least 3 AUUG members, at least one of whom belongs to the AUUG national executive, and optionally a representative from another organisation.
- The decision of the evaluation committee is final and the committee reserves the right to not award the prize if a suitable entry has not been submitted.

Final date for receipt of entries is 5pm Friday 28th July 2000

The prize consists of:

- A cash prize of $1000
- One year's membership of AUUG
- Announcement of the prize at the main AUUG conference and in AUUGN (the AUUG Journal)
- A certificate
- The winner's name inscribed on a permanent awards board, displayed in the AUUG office and at the main conference

What sort of work might qualify?

The work will be focussed on software which relates to computer communications, networks, operating systems, or similar. If you are not sure whether your work may qualify, mail:

Lions_Award@auug.org.au

Entries may be submitted by email to **Lions_Award@auug.org.au** or by post to:

John Lions Student Award
AUUG
PO Box 366
KENSINGTON NSW 2033

My Home Network

Frank Crawford
frank@crawford.emu.id.au

I have a confession to make, not everything I plan for this column is yet in my home network. For example, last issue I wrote that I would be talking about security and securing your network at home. My plan was to install a number of security items in my home network before I wrote the column and then describe them. Unfortunately, I haven't had any time over the last few months to do so.

On the other hand it is fortunate I didn't, because one of the key components I was to describe is Linux IPChains, which I have set up in a very basic fashion. However, this is about to be replaced by NetFilter, an all round better package, when Linux 2.4 is released. While Linux 2.4 may not be out by AUUG2K, Paul "Rusty" Russell the Linux Kernel IP Firewall Maintainer and developer of NetFilter, will be running a tutorial. As well, Darren Reed, the author of IPFilter, used on most other free Unixes is also a Keynote speaker.

Anyway, on to what this column is about, and the real reason my home network exists, is the applications my family are running. Like users in any environment, they expect every application they have seen to work without any idea of what is behind it, and like any network anywhere, the major application is email.

My children have e-pals, and regularly communicate with them. But since we have a number of machines within the house, they need to be able access their mail from any one of these machines.

This means that the central server, bits, is also the mail server for my home. As I've described in a previous column, all mail is delivered to it, and mail headers are rewritten to appear to come from this machine. Once the mail is delivered to the family's separate mail boxes (yes, everyone has their own mail box) it is necessary for them to be able to read it from any other machine. Every user needs an account on the mail server.

The traditional way to do this was using a client (or MUA - Mail User Agent) that supported the POP or Post Office Protocol to download each item to the users computer. A better mechanism now available is to use IMAP or the Internet Message Access Protocol, which allows the mail to stay on the remote server and only downloads a temporary copy. IMAP also allows the creation and manipulation of multiple folders on the mail server as well as the deletion of mail items no longer required.

To support this, the mail server needs to run a daemon that supports IMAP (currently IMAP4 or IMAP version 4) and optionally POP. While this is in most modern mail systems, on Unix and Linux, for small environments it is most commonly supported by `imapd` and `popd`. These were developed at the University of Washington (along with pine) and are available in the `imap` RPM for RedHat. You do need to make sure that you have the latest version, and keep up to date, as numerous security problems have been found within `imapd` and have subsequently been fixed.

The installation of `imapd` and related items is simple, as they run out of `inetd`, the main network services daemon. All you need is to add a line to `/etc/inetd.conf` of the form:

```
imap    stream  tcp     nowait  root \
        /usr/sbin/tcpd  imapd
```

which is usually in the standard `inetd.conf`, but commented out anyway. (Note this also includes the use of TCP Wrappers, a security feature.) You then need to restart `inetd` either with a `killall -HUP inetd` or by rebooting the system.

Just as an aside, while IMAP defines access to a mail box, most MUAs use normal SMTP for sending out mail. This is then handled by `sendmail`, again running on the mail server to send a mail item off to its destination. This means that there is no additional configuration needed to send mail out.

Once the mail server is configured, the next thing needed is to configure the client side or MUA. Unix has a number of different mail clients that can handle IMAP, including `pine`, `mutt` and Netscape Mail. However, in my case, the preference is for that tool of the evil empire (:-)) Outlook Express. It runs fine on both the Windows 98 and Macintosh systems in the house and provides a simple, convenient interface for everyone to use.

Of course Outlook Express doesn't always suit me, so at times I run `mutt` or even standard Linux `mail`. While `mail` can't understand IMAP, it does understand NFS (or at least the systems do), so I have exported `/var/spool/mail` from my mail server to the other Linux systems in the house. It works fine for a small network, although for a much bigger installation, I wouldn't suggest it (even if it is widely used).

The configuration you need to setup your mail client is as follows (translate it to relevant MUA):

```
Protocol:     IMAP (or IMAP4) (port 143)
IMAP Host:    mailhost.your.domain
SMTP Host:    mailhost.your.domain
Login id:     youracct
Email addr:   youracct@your.domain
Mailbox:      INBOX (i.e your default
system mailbox)
```

One other item that may come up is that IMAP can be run over SSL and even has its own port (`tcp/993`), however, `imapd` doesn't support this in any native fashion. You may be able to hack it in, but in a home network environment it is probably an overkill. The only case I can see for its use is if you intend to dial into your home network from

elsewhere. I hope to offer a better solution in a later column (This involves the use of IPSec connection such as FreeSWan with Road Warrior support).

A couple of other tips I can offer in setting up mail clients for home. You need to be fairly liberal with the use of aliases. In my case, while most of the family have logins that come from their initials, I have added aliases in the system for their first name as well. There is even one for the dog (although one of the children read that one). The use of these aliases, make it much simpler for their friends to remember and gets around the Unix limit of a maximum of 8 characters in a user name.

Finally, one other important point, especially with the spread of things like the LoveLetter Worm, you need to ensure that you keep your virus software up to date, and teach all your family to be careful of strange mail items. If we start teaching children to do it now, maybe things will be much safer in the future.

Anyway, that is all for this column, let me know of any great ideas you have for your home network, or need anything clarified for this or any previous column and I'll see you at AUUG2K.

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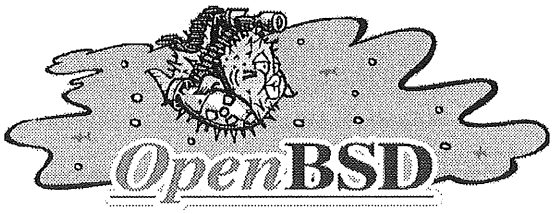

Press Release

Open BSD 2.7

Source: OpenBSD `http://www.OpenBSD.org/`

June 15, 2000

Calgary, Canada -- OpenBSD announces release 2.7 of the "Secure by Default" operating system for Internet servers and workstations. OpenBSD 2.7 significantly enhances the built-in strong cryptography with the OpenSSH suite to support the SSH 1 and 2 secure communication protocols and drivers for hardware accelerators for IPSec VPNs.

"OpenBSD's principal goal of security and stability is NETSEC's basis for using it as foundation of our managed security solution," stated Todd Waskelis, NETSEC Vice President. "We've even funded the development efforts of the hardware crypto support in OpenBSD 2.7, which allows us to deliver high bandwidth VPN connections cost-effectively to our clients, and as a bonus, anyone can do it themselves since the code is free".

OpenBSD's cryptography has been further enhanced by encrypting virtual memory swap space, and by more flexible ISAKMPD key exchange and operating modes for IP Security networking. OpenBSD completely avoids the US export controls on cryptography because it is published in Canada with cryptographic software developed entirely outside the USA. Support for SSH1 and HTTPS secure protocols depends on the RSA public key algorithm patented in the USA. Users worldwide may use the OpenSSL free library while those in the USA must use the non-commercial RSAREF library to abide by the patent.

"This is the last release where we have to worry about the RSA patent since it expires on September 21", says project leader Theo de Raadt. "RSA is the premier key exchange algorithm and this patent has held a greater stranglehold on cryptographic operations than any government policy".

OpenBSD's SSH support is done with the free OpenSSH suite also developed by OpenBSD team members. The suite has been ported to other systems and is rapidly gaining in popularity.

OpenBSD 2.7 improves support for high end system boards, SCSI controllers, ethernet interfaces, and adds gigabit ethernet drivers and IPv6 networking. There are over 500 pre-compiled application packages ready to install, and most Linux binaries run without recompiling thanks to the emulation system.

OpenBSD is free software, released under a Berkeley-style open source license. It is developed by a team of Internet volunteers, based on UC Berkeley's 4.4BSD-Lite. OpenBSD runs on PCs, SPARC, Mac68K and other hardware. All development is funded by donations and the sale of CD-ROMs and T-shirts. Commercial support is available from third party contractors and companies.

OpenBSD on the Web:
`http://www.OpenBSD.org/`

What's new in OpenBSD 2.7:
`http://www.OpenBSD.org/27.html`

About OpenSSH:
`http://www.OpenSSH.com/`

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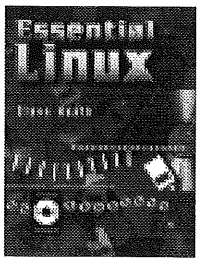


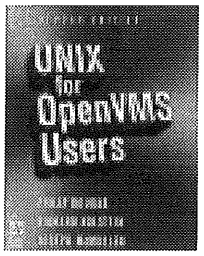
ESSENTIAL LINUX *with CD Rom included* Steve Heath

Essential Linux addresses and provides the essential information for getting a Linux system up and running, looking after it, and using it. It includes many screen shots and examples of essential commands and utilities. This book focuses on practical installations, such as converting IBM PCs, transferring data from Windows and MS-DOS and running Linux in conjunction with Windows. CD Rom included.

Contents: Inside Linux * Installing Linux * Linux commands * bash shell scripts * tcsh shell scripts * Editors * System Administration * Linux Networking * Installing XFree86 * If the command does not work..

ISBN 1 55558 177 3 : 250pp : PB : 1997 : ARRP ~~$80.00~~ : *MEMBER PRICE $64.00*

UNIX FOR OPEN VMS USERS 2ed Richard Holstein, Joseph McMullen & Philip Bourne



This book is for users who are making the transition from OpenVMS to UNIX and provides a comprehensive comparison of commands and utilities. Working into practical examples, the book shows simple daily tasks that map one-for-one from OpenVMS to UNIX.

Contents include: Introductory File Management * Editing * Communicating with Other Readers * Monitoring & Utilizing System Resources * Devices, Queues, & Background Processing * Processor-to-Processor Communications

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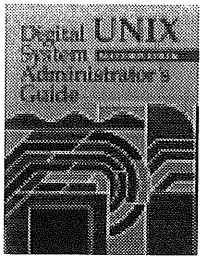

DIGITAL UNIX SYSTEM ADMINISTRATOR'S GUIDE Matthew Cheek

Digital UNIX System Administrator's Guide is the first book to address Digital UNIX system administration from an experienced administrator's point of view. Every topic covered is specific to Digital UNIX, serving as a valuable reference guide for experienced UNIX system administrators who are new to Digital UNIX.

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TRU64 UNIX FILE SYSTEMS ADMINISTRATION HANDBOOK Steve Hancock

"Tru64 UNIX" is the new name Compaq has given the Digital UNIX operating system. This unique and authoritative book helps systems administrators and other technical professionals understand and master perhaps the most critical part of Tru64 UNIX - the file system by which the operating system stores and manipulates all of the information that enables both it and other applications to function. *Tru64 UNIX File Systems Administration Handbook* covers all of the newest and most advanced Tru64 UNIX features, including Compaq's TruCluster technology, which enables organizations to grow their systems by integrating many individual computers.

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The Open Source Lucky Dip

Con Zymaris
conz@cyber.com.au

Welcome back.

Doubtless you are reading this on your way to (or from) AUUG2k. Hope it was a blast for you and your colleagues.

Let's dive straight into this editions tools and news items, fresh from the open source mosh-pit.

✧ ✧ ✧

"Customer: "Can you copy the Internet for me on this diskette?""

✧ ✧ ✧

PHP 4.0 Released!

PHP, a personal favorite amongst web-scripting technologies, has just hit version 4.0 Developed several years ago by Rasmus Lerdorf, PHP can now boast usage in over 1 million web-domains. It is easy to use, powerful, multiplatform, fast and of course, open source. PHP 4.0 brings several nifty front-end features to the user community, but most of the goodies are in its new Zend back-end engine. The PHP developer mailing lists have boasted of anything upto a 10-fold performance increase with this new version. For download binaries for *BSD, Linux et al, visit:

`http://www.php.net/`

✧ ✧ ✧

InterBase 6.0 Open Source Release Imminient.

InterBase, the fully-featured SQL engine from Inprise/Borland, is set to be released in open source format. Interbase sports all the capabilities a web-database developer will likely need, and has a solid reputation and following. People who have been using databases like MySQL and PostgreSQL in particular will want to check InterBase out. InterBase is available at:

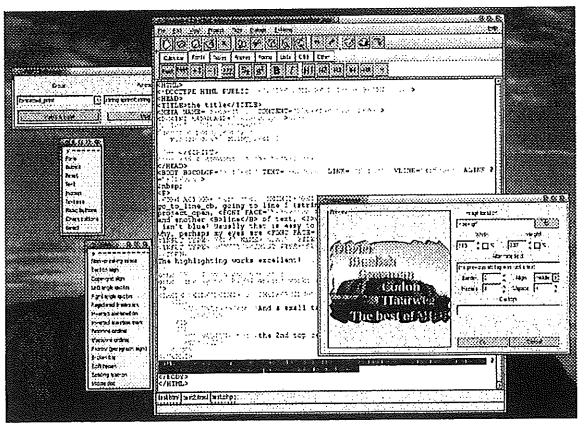
`http://www.interbase.com/`

✧ ✧ ✧

Bluefish: GUI HTML Editor

Bluefish is a HTML editor for Linux which is designed to give programmers and experienced webmasters power and flexibility, but still provide an intuitive graphical interface. Features include: multi-file editing, multiple toolbars, custom menus, image and thumbnail dialogs, open content directly from the web, CSS dialogs, PHP, SSI and RXML support, HTML validation and heap of wizards. This new version allows for much faster highlighting, a new, very powerful search-and-replace engine (allowing regular expressions), more logical menus, more HTML features, more translations into your local language, and a lot of bugfixes. Bluefish is released under the GPL and can be downloaded at:

`http://bluefish.openoffice.nl/`



Make HTML coding easier with Bluefish

✧ ✧ ✧

Bill Gates (Chief Bloatware Architect): How the hell did you get into my mansion? I spent three million dollars on barbed wire fences, guard dogs, crocodile-filled moats, automatic machine guns, and highly-trained body guards to keep you Linux freaks off my property!

-- Humorix's take on posing the 'break-up' question to Bill Gates

✧ ✧ ✧

Wine 1.0: Windows apps running on Linux

After what appears to have been an extremely long gestation period, Wine 1.0 is rumoured to be nearing release. Launched as a project to create a free re-implementation of the core Win16 and Win32 API under platforms such as Linux and FreeBSD, Wine has seen rapid improvement in recent months. Wine allows users to run their favourite Windows apps under Linux. Wine also allows developers to compile their Windows apps from source, into Linux apps. This, in effect, is what Corel has done with their recent release of Wordperfect Office 2000 for Linux. By using (and contributing to) to Wine development, they have been able to recompile their whole Windows-based Wordperfect Office applications suite under Linux

with minimal re-coding. This allows developers a single source base. More information on Wine 1.0 can be found at:

http://www.winehq.com/

BASTILLE LINUX: BATTON DOWN THE HATCHES.

Security and functionality should be the basis of operations on the Internet. Too many people eschew security, which is the reason for the large number of cracker breakins which occur. One way to bolster security at your site, is to use a hardened OS, such as Bastille Linux. According to its creators, Bastille aims to be the most comprehensive, flexible, and educational Security Hardening Program for Red Hat Linux 6.0/6.1. Virtually every task it performs is optional, providing immense flexibility. This new version has the ability to be installed on non-virgin systems, can be run multiple times, is undoable, and includes a log-only mode.

Check out the homepage at:

http://bastille-linux.sourceforge.net/

"There are two major products that come out of Berkeley: LSD and UNIX. We don't believe this to be a coincidence."

STOP VBSCRIPT/MS-OUTLOOK VIRII WITH VBS

The recent spate of damaging, widespread and infamous virii (Lovebug et. al.) are not 'Internet virii', but 'MS-Outlook virii'. These virii will not damage Linux, Unix or MacOS based systems, just Win32-based systems running MS-Outlook as the mail user agent (MUA). The Internet should not be blamed for a single vendor's poor default security settings, nor should end-users be in constant fear of receiving email with damaging content. Vbs is here to help. Developed by Theo Nolte and released as GPL open source, Vbs is a mail-filter to make attachments un-executable. It works by replacing the dot in the filename extension of critical attachments with a tilde, so that MUAs won't recognize those attachments anymore as executable. It is implemented as a wrapper for the delivery agent. Get Vbs from:

http://ads1-nolte1.rz.rwth-aachen.de/progs/vbs/

GINI 1.0

If you want to get your hands on some working Jini code for distributed computing applications, have a look at this GPL project. Developed at UC Berkeley, Gini is a light-weight Jini clone. Gini has its own remote method invocation framework. According the author, Gini has the ability to generate bytecode for remote object proxies on the fly, so there's no need to use RMIC. Network service discovery is simple, using UDP broadcasts. Check out the homepage at:

http://www.xcf.berkeley.edu/~yaroslav/gini

If you have any experiences using Linux that you would like to share with other AUUGN readers, drop us a line at:

auugn@auug.org.au

We'd love to hear from you!

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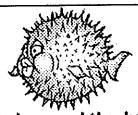 So long, and thanks for all the passwords Blowfish T-shirt (C code on back)	L		$25.00	$
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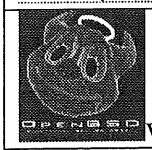 Wire Frame design – black background	L		$25.00	$
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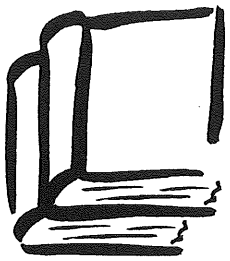

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Unix Traps and Tricks

Jerry Vochteloo
jerry@socs.uts.edu.au

Welcome again to Unix Traps and Tricks. It seems that there are plenty of people out there who don't want to see the demise of this column. Thanks for all of your suggestions and contributions, please keep them coming.

One of the suggestions was that this column cover some of the "basics", hence if anyone would like to write a short tutorial on some tricky facet of UNIX (doesn't that cover everything), that would be greatly appreciated.

Here are contributions from Greg Rose and Graham Jenkins.

Jerry
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XARGS

Greg Rose
ggr@qualcomm.com

I think `xargs` is one of the most under used utilities. It takes a list of filenames and applies a command to them, where the list can be arbitrarily long. (Once upon a time, this was important, because systems limited how many characters of arguments could be passed to one command. `xargs` would take care of that for you, executing multiple commands if necessary. Now, under good systems you don't have a limit, and under bad systems you pretty much have to type them, so it isn't so important.) These days, of course, you can get the same effect by using backquotes in the shell, but I'm showing my age.

Another useful one, in the same style, is the `-l` flag to `grep`. This tells it that all you really want is the filenames where there is a match in the file, so you can subsequently do something with them. Just what you need to use with `xargs`, or for that matter with backquotes! I have a little shell script which I call `vl` for "vi a list":

```
#!/bin/ksh
P="$1"
shift
BASEEXINIT="$BASEEXINIT|set ic|map N :n!^Mn" export BASEEXINIT
vi "+/$P" `grep -i -l "$P" ${@:-*.[chf]}`
```

(Wow. Remind me one day to write about all the custom vi macros I use. My scripts grow over time, as I find new features I want to put in them.)

Here's the two line version:

```
P="$1"; shift
vi `grep -l "$P" "$@"`
```

Basically, it separates out the pattern argument, then edits all files that match that pattern. Wonderful for editing all source files that reference a variable, call a particular function, etc.

Anyway, a minute ago, I needed to find a mobile phone number for a person, and I was sure I had it in email from that person. I archive email using Rand mail, which stores each item in a separate file. So I wanted to search for all files which mentioned the person's name, and then (in *only* those files) look for occurrences of the pattern `mobile|cellular|cellphone`.

This came out quite naturally, as:

```
find Mail -print | xargs grep -li <person> | xargs grep -i "<whatever>"
```

Now, it is possible to do that in POSIX shells without using `xargs`, but I can never remember how to nest

backquotes. (It's $(cmd), in case you were wondering, but I find the pipeline form to be more intuitive, and would use it anyway.)

I never did find the phone number, but it made me write this.

PRINTING WITHOUT SPOOLING

Graham Jenkins
grahjenk@au1.ibm.com

A few weeks back, I had a need to send postscript output to a non-postscript printer. Not a problem - just use the `ghostscript` program is shown in the following System V print filter.

```
#!/bin/ksh
# @(#)netibmgsaGS   Ghostscript interface for postscript/text files.
#                   Graham Jenkins, IBM GSA, February 2000.
#                   Last modified: 05/03/2000

# Typical 'lpadmin' command (where BSD printer 'graham_S' previously defined:
# lpadmin -p graham -v /dev/null -m netibmgsaGS -I any -T PS \
#         -o dest=PJL
#    (or  -o stty=PJL  for Solaris 2.5)
#
# Note:  Omit PJL switch for LaserJet 2d/3d.

# Set up redirection of stderr, set trap for disable/cancel
export PATH=/bin:/usr/bin:/usr/lib:/usr/ucb
export LD_LIBRARY_PATH=/usr/openwin/lib:/usr/lib
Log=/usr/spool/lp/logs/lpsched ; [ -w $Log ] || Log=/dev/null ; exec 2>>$Log
trap "trap 15; kill -15 0; exit 0" 15

# Extract number of copies, etc.
Copies=$4; Options=$5; Du= ; Ra=
shift; shift; shift; shift; shift
for Option in $Options ; do
  case "$Option" in
    dest*|stty* ) Swit="`echo \"$Option\"|nawk -F= '{print $2}'|tr -d \"'\"`";;
    d*|D*       ) Du=Y ;;                          # Duplex
    r*|R*       ) Ra=Y ;;                          # Raw
  esac
done

# Use postscript or text filter for each file, pass output to 'slave' printer;
# ghostscript version is compiled so 'laserjet' device prints duplex-mode.
Count=1
( while [ $Count -le $Copies ] ; do
    for File in $* ; do
      if [ "$Ra" = Y ] ; then
        cat $File
      else
        [ "$Swit" = PJL ] && echo "\033%-12345X@PJL ENTER LANGUAGE=PCL\n\r\c"
        echo "\033E\033&l1X\c"
        if file $File | grep -i postscript >/dev/null 2>&1 ; then
          [ "$Du" = Y ] && De=laserjet || De=ljetplus
          /usr/local/bin/gs \
            -sDEVICE=$De -q -sOutputFile=- -dNOPAUSE $File -c quit
        else
          [ "$Du" = Y ] && echo "\033&l1S\c" || echo "\033&l0S\c"
          echo "\033&l26A\033&k2G\033&l1o5.00c66F\033(s11.80H\c"
          cat $File
        fi
        [ "$Swit" = PJL ] && echo "\033E\033%-12345X\c"
      fi
    done
    Count=`expr $Count + 1`
  done ) | lp -d `basename $0`_S >/dev/null 2>&1      # CHANGE-THIS-LINE
```

```
exit 0
```

This program worked well in a test environment - but exhibited 'full-file- system' problems in production - because it can produce and spool some output files which (due to the `ghostscript` conversion) are much larger than its corresponding input files.

The immediate solution was to change the `lp -d ..` line near the filter program end to read instead:

```
    done ) | /usr/local/bin/hpnpout3 `basename $0` >/dev/null 2>&1
```

At the same time, I dispensed with the slave-printer definition for `` `basename $0`_S `` - and created a entry in `/etc/hosts` for `` `basename $0` ``.

The `hpnpout3` program is a simple executable for HP network printers which pipes its standard input to `tcp port 9100`. It can be called with a parameter which allows alternate ports to be used so as to enable its use with 3-port Jetdirect devices. I can supply a copy to anyone who emails me a request.

In fact, this solution also works for more recent Lexmark printer interfaces, and probably for some others too. But I started to think about what one could do if the destination printer would only accept BSD `lpd` requests.

One solution available with more recent versions of Solaris would be to use the `netpr` program - which sends a designated file directly to a nominated printer at a remote address using the `lpd` protocol. Even if you have `netpr` - you may still have a problem - because you have to place your full output file somewhere before you call `netpr`.

Why, I asked myself, would `netpr` not accept standard input? The answer lies in the `lpd` protocol itself as defined in RFC1179. This specifies that each file sent within a Job should be preceded by a block in which its length is declared. It actually allows declaration of a zero length for a file whose length is unknown - but this capability doesn't seem to have been incorporated in too many implementations.

Jobs sent to a simple device, such as a Jetdirect - which ignores control-file content and prints data-files blindly - can have the data file length set to a large value. But such jobs will be rejected by more intelligent print servers.

My eventual solution was to break a print-job from standard input into a number of data files, and send them sequentially within the same job. The source code appears hereunder:

```
/* bsdprint2.c      Send input stream to BSD print queue on remote machine, by
 *            splitting stream into finite-length data files.
 *            Developed by Graham Jenkins at IBM GSA during March 2000.
 *            Reference:    RFC 1179.
 *            Compilation:  cc -O -lnsl -lsocket bsdprint.c
 *            Installation: Requires SUID root priveleges for port access.
 *            Last revised: 16/03/2000.
 */

#define       DFILES 832   /* Maximum number of data files (52-832)             */
#define  FSIZE  2048       /* Maximum number of blocks in data file (512-8192)  */
#define       BSIZE  8192  /* Block size (bytes) (512-8192)                     */

#define  MIN(x,y) ( x < y ) ? x : y
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <netdb.h>
#include <stdio.h>

send_chk( int fd, char *buffer, int bytes, char *comment ) {
  if( send(fd, buffer, bytes, 0) < bytes) {
    fprintf(stderr, "Send/check failed: %s\n", comment);
    exit (1);
  }
  return (0);
}

send_ack( int fd, char *buffer, int bytes, char *comment ) {
  char status;
```

```
  if( (send(fd, buffer, bytes, 0) < bytes) ||
      (recv(fd, &status,1             , 0) < 1)    ) {
    fprintf(stderr, "Send/acknowledge failed: %s\n", comment);
    exit (1);
  }
  return (0);
}

main(int argc, char *argv[]) {
  int     fd, nbytes, fileno, start, sent, bytesleft, j, totalfiles;
  int     offset=-1, port=731;
  char    localhost[32], filename[64], sequence[64];
  char    buffer[BSIZE];
  char    alpha1[]="defghijklmonpqrs";
  char    alpha3[]="ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmonpqrstuvwxyz";
  char*   filebuffer;
  char*   version="@(#) bsdprint2 1.05 16/03/2000 Graham Jenkins";
  struct sockaddr_in addr;
  struct hostent *hostaddr;

  /* Usage check */
  if      ( ( argc == 3 ) && ( strcmp(argv[1],"-v") != 0 ) ) offset = 0;
  else if ( ( argc == 4 ) && ( strcmp(argv[1],"-v") == 0 ) ) offset = 1;
  else {
    fprintf(stderr, "Usage: %s [-v] host printer\n", argv[0] );
    exit(2);
  }

  /* Extract and check 'host' parameter */
  if ((hostaddr = gethostbyname(argv[offset + 1])) == NULL) {
    fprintf(stderr, "Unable to locate host: %s\n", argv[offset + 1]);
    exit (1);
  }

  /* Allocate file buffer */
  if ( (filebuffer = (char *) malloc(FSIZE * BSIZE * sizeof(char))) == NULL ) {
    fprintf(stderr, "Unable to allocate buffer: %d bytes\n", FSIZE * BSIZE );
    exit (1);
  }

  /* Connect, using source port 721-731, destination port 515 */
  memset(&addr, 0, sizeof(addr));
  memcpy(&(addr.sin_addr), hostaddr->h_addr, hostaddr->h_length);
  addr.sin_family = hostaddr->h_addrtype;
  addr.sin_port   = htons(515);
  setuid(0);
  while ( (fd = rresvport(&port)) < 0 ) {
    if( offset ) fprintf(stderr, "Failed to reserve port: %u\n", port);
    port--;
    if ( port < 721 ) port = 731;
    sleep(2);
  }
  while (connect(fd, (struct sockaddr *)&addr, sizeof(addr)) < 0) {
    if( offset ) fprintf(stderr, "Failed connection to port: 515\n");
    close(fd);
    sleep(2);
  }

  /* Send command sequence "Receive a Printer Job" */
  sprintf( buffer, "\002%s\n", argv[offset + 2]);
  send_ack( fd, buffer , strlen(buffer), "Receive-print-job");
  gethostname(localhost, sizeof(localhost));
  localhost[31] = '\0';
  sprintf(sequence, "%03.3d%s", getpid() % 1000, localhost);

  /* Send data files */
  fileno=0;
  while ( (nbytes = fread(filebuffer, 1, FSIZE * BSIZE, stdin) ) > 0) {
    sprintf(filename,"%cf%c%s",alpha1[fileno/52],alpha3[fileno % 52],sequence);
    sprintf( buffer, "\003%d %s\n", nbytes, filename );
    send_ack( fd, buffer , strlen(buffer), "Receive data-file");
```

```
    if( offset ) fprintf(stderr, "Sending data file: %s\n", filename);
    start = 0;
    bytesleft = nbytes;
    while (bytesleft > 0 ) {
      for(j=0; j < (MIN(BSIZE,bytesleft)) ; j++ )
        buffer[j] = filebuffer[start + j];
      send_chk( fd, buffer, MIN(BSIZE,bytesleft), "Data-file block");
      sent = MIN(BSIZE,bytesleft);
      start = start + sent;
      bytesleft = bytesleft - sent;
      if( offset) fprintf(stderr, "Sent: %u bytes Left: %u\n", sent, bytesleft);
    }
    send_ack( fd, "", 1, "Data-file");
    fileno++;
    if( fileno >= ( MIN(DFILES,832) ) ) {
      fprintf(stderr,"Max number of data files exceeded: %d\n",MIN(DFILES,832));
      exit (1);
    }
  }

  /* Construct and send control file */
  totalfiles = fileno;
  fileno = 0;
  sprintf( buffer, "\002%d cfA%s\n",
    strlen("H") + strlen(localhost) + strlen("\nPdaemon\n") +
    totalfiles * 3 * ( strlen("ldfA") + strlen(sequence) + strlen("\n") ),
    sequence );
  send_ack( fd, buffer , strlen(buffer), "Receive control-file");
  sprintf(buffer, "H%s\nPdaemon\n",localhost);
  if( offset ) fprintf(stderr, "Sending control file: cfA%s\n", sequence );
  send_chk( fd, buffer, strlen(buffer), "Control-file block");
  for ( j=0 ; j < totalfiles ; j++ ) {
    sprintf(filename,"%cf%c%s",alpha1[j/52],alpha3[j % 52],sequence);
    sprintf(buffer, "l%s\nU%s\nN%s\n", filename, filename, filename);
    if ( j < (totalfiles - 1) )
      send_chk( fd, buffer, strlen(buffer),     "Control-file");
    else
      send_ack( fd, buffer, strlen(buffer) + 1, "Control-file");
  }

  /* Wrap it up */
  close(fd);
  exit(0);
}
```

❖

AUUG Chapter Meetings and Contact Details

CITY	LOCATION	OTHER
BRISBANE	Inn on the Park 507 Coronation Drive Toowong	For further information, contact the QAUUG Executive Committee via email (qauug-exec@auug.org.au). The techno-logically deprived can contact Rick Stevenson on (07) 5578-8933. To subscribe to the QAUUG announcements mailing list, please send an e-mail message to: <majordomo@auug.org.au> containing the message "subscribe qauug <e-mail address>" in the e-mail body.
CANBERRA	Australian National University	
HOBART	University of Tasmania	
MELBOURNE	Various. For updated information See: http://www.vic.auug.org.au/auug vic/av_meetings.html	The meetings alternate between Technical presentations in the odd numbered months and purely social occasions in the even numbered months. Some attempt is made to fit other AUUG activities into the schedule with minimum disruption.
PERTH	The Victoria League 276 Onslow Road Shenton Park	Meeting commences at 6.15pm
SYDNEY	The Wesley Centre Pitt Street Sydney 2000	

Up-to-date information is available by calling AUUG on 1800 625 655.

Application for Institutional Membership

Section A: MEMBER DETAILS

The primary contact holds the full member voting rights and two designated representatives will be given membership rates to AUUG activities including chapter activities. In addition to the primary and two representatives, additional representatives can be included at a rate of $88 each. **Please attach a separate sheet with details of all representatives to be included with your membership.**

NAME OF ORGANISATION: _____

Primary Contact

Surname _____ First Name _____

Title: _____ Position _____

Address _____

Suburb _____ State _____ Postcode _____

Telephone: Business _____ Facsimile _____

Email _____ Local Chapter Preference _____

Section B: MEMBERSHIP INFORMATION.

Renewal/New Institutional Membership of AUUG *(including Primary and Two Representatives)*	☐	$429.00
Surcharge for International Air Mail	☐	$132.00
Additional Representatives	Number ☐	@ $88.00

Rates valid as at 1 March 2000. Memberships valid through to 30 June 2001 and include 10% GST.

Section C: PAYMENT

Cheques to be made payable to **AUUG Inc** *(Payment in Australian Dollars only)*

For all overseas applications, a bank draft drawn on an Australian bank is required. Please do not send purchase orders.

-OR-

☐ Please debit my credit card for A$_____

☐ Bankcard ☐ Visa ☐ Mastercard

Name on Card _____

Card Number _____

Expiry Date _____

Signature _____

Please mail completed form with payment to:

Reply Paid 66
AUUG Membership Secretary
PO Box 366
KENSINGTON NSW 2033

Or Fax to:

AUUG Inc
(02) 8824 9522

Section D: MAILING LISTS

AUUG mailing lists are sometimes made available to vendors. Please indicate whether you wish your name to be included on these lists:

☐ Yes ☐ No

Section E: AGREEMENT

I/We agree that this membership will be subject to 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.

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

Signed: _____

Title: _____

Date: _____

AUUG Secretariat Use

Chq: bank _____ *bsb* _____

A/C: _____ *#* _____

Date: _____ *$* _____

Initial: _____ *Date Processed:* _____

Membership#: _____

AUUG Inc

UNIX® AND OPEN SYSTEMS USERS

Membership Application

AUUG Inc
PO Box 366, Kensington NSW 2033, Australia

Tel: (02) 8824 9511
Free Call: 1 800 625 655
Fax: (02) 8824 9522

email: auug@auug.org.au

ACN A00 166 36N (incorporated in Victoria)

http://www.auug.org.au

AUUG Inc is the Australian UNIX and Open Systems User Group, providing users with relevant and practical information, services and education through co-operation among users.

AUUG OFFERS SOMETHING FOR YOU!!

AUUGN

Technical Newsletter

AUUG's quarterly publication, keeping you up to date with the world of UNIX and open systems.

Education

Tutorials
Workshops

Events.....Events.....Events

- Annual Conference & Exhibition
- Overseas Speakers
- Local Conferences
- Roadshows
- Monthly Meetings

DISCOUNTS

*to all AUUG **events** and **education**.*

Reciprocal arrangements with overseas affiliates.

*Discounts with various **internet service providers, software, publications** and more...!!*

Connections

- Newsgroup aus.org.auug

Application for Individual or Student Membership

Section A: PERSONAL DETAILS

Surname _____ First Name _____

Title: _____ Position _____

Organisation _____

Address _____

Suburb _____ State _____ Postcode _____

Telephone: Business _____ Private _____

Facsimile: _____ E-mail _____

Section B: MEMBERSHIP INFORMATION

Please indicate whether you require Student or Individual Membership by ticking the appropriate box.

RENEWAL/NEW INDIVIDUAL MEMBERSHIP

Renewal/New Membership of AUUG ☐ $110.00

RENEWAL/NEW STUDENT MEMBERSHIP

Renewal/New Membership of AUUG *(Please complete Section C)* ☐ $27.50

SURCHARGE FOR INTERNATIONAL AIR MAIL ☐ $66.00

Rates valid as at 1 March 2000. Memberships valid through to 30 June 2001 and include 10% GST.

Section C: STUDENT MEMBER CERTIFICATION

For those applying for Student Membership, this section is required to be completed by a member of the academic staff.

I hereby certify that the applicant on this form is a full time student and that the following details are correct.

NAME OF STUDENT: _____

INSTITUTION: _____

STUDENT NUMBER: _____

SIGNED: _____

NAME: _____

TITLE: _____

DATE: _____

Section D: LOCAL CHAPTER PREFERENCE

By default your closest local chapter will receive a percentage of your membership fee in support of local activities. Should you choose to elect another chapter to be the recipient please specify here:

_____

Section E: MAILING LISTS

AUUG mailing lists are sometimes made available to vendors. Please indicate whether you wish your name to be included on these lists:

☐ Yes ☐ No

Section F: PAYMENT

Cheques to be made payable to **AUUG Inc**
(Payment in Australian Dollars only)

For all overseas applications, a bank draft drawn on an Australian bank is required. Please do not send purchase orders.

-OR-

☐ Please debit my credit card for A$_____

☐ Bankcard ☐ Visa ☐ Mastercard

Name on Card _____

Card Number _____

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Signature _____

Please mail completed form with payment to:

Reply Paid 66
AUUG Membership Secretary
PO Box 366
KENSINGTON NSW 2033
AUSTRALIA

Or Fax to:

AUUG Inc
(02) 8824 9522

Section G: AGREEMENT

I agree that this membership will be subject to 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.

Signed: _____

Date: _____

AUUG Secretariat Use

Chq: bank _____ *bsb* _____

A/C: _____ *#* _____

Date: _____ *$* _____

Initial: _____ *Date Processed:* _____

Membership#: _____