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Editorial

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It's AUUGN time again. The year is flying away fast; before you know it, the clock is going to strike 2000 (we hope!), and the new year will be upon us.

It's very much a unique time for a lot of us; the whole Y2K issue is very much a once in a lifetime experience. Future generations are sure to stifle a chuckle when they hear all about Y2K and the lengths companies went to, to make sure their software was compliant.

I personally can't wait until it's all over; mainly, so I can get back to planning future strategies, as opposed to the current trend which is to plan for Y2K. No-one is really thinking too much about after Y2K; they're just trying to get through it, and then looking forward to a well deserved holiday ..

I can't wait.

Back to reality ..

A welcome to our new Unix Traps & Tricks Sub-editor; Jerry Vochteloo. Jerry's taken over from Matty Dawson, and we wish him all the best in his new role. Time to get those submissions in!

If any of you are interested in being published in AUUGN, or maybe keen to promote a new idea, drop me a line!

Before I go, a special thanks to Stephen Rothwell and Jeremy Bishop from AUUG Canberra, for all their help in the last couple of months.

See you in next time!

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Contribution Deadlines for AUUGN in 1999/2000

Volume 20 • Number 3 – August 1999:	**July 17th, 1999**
Volume 20 • Number 4 – November 1999:	**October 17th, 1999**
Volume 21 • Number 1 – February 2000:	**January 17th, 2000**
Volume 21 • Number 2 – May 2000:	**April 17th, 2000**

President's Column

Lucy Chubb
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At the end of my term as president this year I will be standing down in the expectation that there will be a third Chubb by the time of the 1999 annual conference. In fact, it will be so close to the conference date that I won't be making it this year, which is disappointing because I always particularly enjoy meeting people there.

In some ways leaving the position of president at this time is a bit frustrating because there are a lot of things to be done -- this is a time where AUUG needs to be seriously examining where it is going and what it is doing particularly with the growth of open source and its movement into mainstream use -- and one year is not long to get started on addressing the challenges properly. As I become less involved, at least for a while, I hope to see new faces involved. Don't wait to be invited -- volunteer! You'll be welcome.

However, I hope to stay involved but in different ways.

See you around.

❖

Congratulations to our own Elizabeth Egan who tied-the-knot with Stephen Carroll on February 28, 1999.

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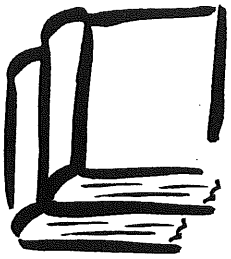

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My Home Network

Frank Crawford
frank@ansto.gov.au

There is an ad currently running quoting famous incorrect computer predictions. One of them, by Ken Olsen is that there is no need for computers in the home. Well, for a long time that was true, and it was only "nerds" and other "techno-weenies" that had such a thing. Of course we all know that today everyone "needs" a computer at home, be it for work, children's education or just for fun, and this ignores all those computers built into other equipment.

Of course the biggest thing in the computer industry today is networks, and in particular the Internet (note the capital `I'). However, most users believe the start (and often end) of a network involves a modem or some other dialup connection. Of course in their office, there is a different type of network, one connecting them to a server, and everyone knows you don't have such items in your home.

Of course such an assumption is just as wrong as the previous one that computers don't belong in the home, however, we are still at the point where it is only the computer "nerds".

Well as one of those "nerds" aka a System Administrator, I have a network in my home and it is tremendously useful, just as in the workplace. Of course my home network didn't spring full grown, but accumulated over time.

To understand why I have such a network, it is necessary to understand my environment. Firstly with a wife who is a computer scientist and school aged children, everyone in the house needs Internet access at some level or another. Secondly, it is bad enough having to find sufficient computers, peripheral are another matter. As in an office not everyone needs access to a printer all the time, and other devices such as modems are by their nature, shareable, at least with sensible protocols.

So, what do I have, for a start, 5 computers (in a house with 4 people and a dog!!!). They have gradually accumulated over the years, they have been upgraded and they have found various niches. Going through in decreasing use. The first is `cnc', a Pentium 233MMX dual-booting between Linux 2.2.9 and Microsoft Windows98 and is used as my main workstation. Next is `jc', a Macintosh PowerMac 5500/250, with a DOS Card running MacOS 8.5.1, Microsoft Windows95 and also LinuxPPC 2.2.9 (i.e. Linux for PowerPC). This is used for most of the children's work, and fits in well with the systems they use at school. This is really a cool machine and means they can run just about anything that goes, Mac, Windows or Unix! In fact the split personality for this system means it has two names, `jc' and `jcdos'.

Next onto the older computers, `fpc', a Macintosh 575, i.e. a 68040 system. This is used when other systems are busy or when it is more convenient as it is located in a bed room. It is useful as a backup for school projects, and has the same Internet access as any other system. In fact, its main use seems to be to play music CDs (a function it does well). I guess I could put Linux for an m68k on it, but the disk is small and I haven't gotten around to it.

Another older computer is `sac', currently a 100MHz Pentium running Windows95, but currently undergoing an upgrade. Eventually it will dual-boot Windows95 and Windows NT Workstation.

Finally, the most interesting and most active system is `bits', a small old, 66MHz Pentium (yes a really old system). It has been upgraded from my original 286, through to the current system. This is the most interesting and important system in the whole house. It is also running continuously, acts as a server for my home network and runs more applications and daemons than the average server. It also runs Linux 2.2.8 (probably 2.2.9 or later by the time this is published).

As well as computers there are two printers (one colour) which are usable by any computer on the network, a scanner which is currently connected to `cnc' and at the moment only usable from Windows98 (and soon by Linux when support is available from the ParPort project) and a V.90 modem, shared across the network. And finally, at the lowest level, the whole lot is joined by a coax Ethernet network.

While the hardware is fun, what is even more fun is the software involved. This is a living, breathing network, running all the applications you'd expect to find in a much larger site, but just as valuable in my home, and all this wouldn't be possible without open systems. By this I mean true open systems, not just something that you can buy off the shelf, but are then stuck with someone's plan for how it works.

So starting at the bottom, the TCP/IP. There is little I can say about this except it is now almost omnipresent. Everything supports it, and you don't need much, except something to route it from a home network to the big bad Internet. For a home network you can get away with a non-routable network (i.e. RFC 1918) and use some form of NAT (Network Address Translation), in fact, in my case I do have a routable network, but have never arranged routing. It is interesting to note that in my original request for a network back in 1995, I made wild claims about how many addresses I'd need in 1, 2 and 5 years, never believing that I would require this, but I am on target to do so. Who would ever believe that a home would need 20 IP addresses? In fact at present I have around 40 allocated, although some are through DHCP!

To actually make use of the network and to allow external access, I need something that can route IP. The obvious choice is one of the free Unixes, in my case Linux. Coming from it's Unix routes, it was able to simply and easily handle IP traffic, including routing from the day it was installed. Admittedly, I did need something extra to handle NAT, but that was just icing.

My initial network installation consisted of just a PPP link to work, which obviously only allowed that machine access to the remote network, however, it was soon obvious that other machines in the house needed access, i.e. `fpc', the children's workstation. As well, as my IP addresses were not known outside my own little world, I needed to change those addresses into something that was globally known. Enter Linux's Masquerading. This is really a simplified version of NAT, mapping all the hidden addresses to a single externally visible address, and then performing the reverse on the return leg. It is not a full NAT implementation, but is perfect for a small network with a single connection to an ISP, etc. It does require kernel support, but that has been available in the Linux kernel since Linux 1.2 (or possibly earlier). For more details, there is a mini-HOWTO describing it for the Linux 2.0 kernel and later.

Obviously there is also a need for a network protocol, such as PPP (point-to-point protocol), and again it is something that just sits there working. With my increasing use of the modem by other machines in my network it became obvious that some sort of autodialing was necessary. Luckily enough, a program called `diald' was available to do just this. It is a "simple" daemon that sits waiting for a traffic to one (or a number) of predefined IP addresses, dials up the remote site and then monitors the traffic to find a suitable time to close it down. Obviously, it also has redial facilities and a whole swag of other tricks. A must in my situation. For this to work well, a second phone line is needed, but these days, even for a single computer connecting to an ISP it is an advantage.

Of course building on this is such important open standards as NTP to synchronise time across all the machines, BIND aka `named' to handle IP address lookups and `sendmail' to manage mail transport. In fact aside from having my own network address, I also have a registered domain name, "crawford.emu.id.au". This is registered through the AUUG server as the domain "emu.id.au" has been delegated to AUUG for registration of individuals. Of course since my IP address isn't routable, all that is registered is an MX record pointing to the masquerade address.

Sitting on top of this is DHCP, a protocol to allocate IP addresses dynamically, including the information needed for routing, etc. This has proved extremely useful, as it enables me to bring home my laptop from work, plug it into my network and continue working with no reconfiguration. In fact, this has also proved an excellent means of transporting patches and other large files between work (which has a higher speed network) and home. The server itself is from the Internet Software Consortium who also write BIND and INN for Internet News, and again software that is freely available.

Of course, all the above is low level stuff that is fun to play with, but not to the average user. One of the important things, and a reason to have a Linux server is the interoperability with the other systems in the house. `bits' is running Samba, to provide both file and print services to Windows on `cnc', `jcdos' and `sac' when they are running those more constrained operating systems. As well as sharing disk space with Samba, it is also integral in the printing setup. As one of the printers is connected to `cnc' which occasionally runs Windows98, all printing requests use the SMB protocol, whether it is in Windows or Linux mode, again with Samba running on `cnc'. As well, to set the time in Windows, `bits' acts as a time server for SMB clients.

To provide similar services to the Linux clients, NFS (i.e. Network File System) allows cross mounting between any of the Linux clients. To make it even more user friendly, the addition of automounting means that many things are only mounted when needed and then unmounted when they become idle. Print services are available through LPD, i.e. the standard Berkeley printing system, and goes so far as to allow printing directly to printers at work, and allow printing from work directly to printers on my home network. It certainly make it look like I'm there.

Not to be left out, the Macintosh clients are supported using the Netatalk package, which provides file and print serves for an Appletalk network. This requires low level support, but this comes as a standard part of the Linux kernel. And like Samba, there is also support for time synchronisation, although recent versions of MacOS support NTP directly. Of course everything isn't perfect, printer support does take a bit of extra work, because the network printer support for HP printers is proprietary, it isn't supported by Netatalk, and hence some special functions aren't available. However, because Apple has long supported Postscript, printer emulation is supported through the use of Ghostscript.

For those who aren't aware, Ghostscript is a public domain Postscript interpreter that is usually used to display on an X11 terminal, but also has drivers to support most common printers, including HP's. This makes it simple to use a common format for printed output, and yet translate it to something suitable for any printer, i.e. device independence.

While accessing work from home was one of the original reasons for implementing my home network, more recently I have also been

implementing dialin access. Since my primary server is up all the time, this makes it easy, with the right software. As well as dialin access, anyone who has recently purchased a modem knows, support for faxing is a standard. So any such software should also support faxing, and, as with all the other software, be free. A suitable package is Hylafax, which provides all the capabilities I have already outlined. It provides the ability to both send and receive faxes, handle in-coming data calls and handles locking with diald. As well, it provides some support for Voice Mail, although I haven't looked into implementing it yet. It does require an additional program I haven't yet obtained.

Despite having a reasonable fast network link, web traffic is still one of the greatest bandwidth hogs around (not everyone has Gigabit links to Microsoft!). To improve performance I have done what both small organisations and large ISPs do, I've implemented a web cache. The most widely used caching software is Squid, and of course it is a public domain product.

It is interesting that not everything is really great across a network. It turns out that it is much simpler to have a CDROM in every system, rather than attempting installs, etc, across the network. Despite network install options, most times it runs much smoother from a locally attached device. This doesn't mean that the CD drives aren't shared, just that I can mount 4 (or shortly 5) at the same time.

Similarly, each system has its own sound card and speakers. This is proving to be interesting, in that the next project is to network audio, Internet phones and related options. I have already pulled interesting tricks on my children with computers suddenly talking, playing music and performing other mischief when no one is around. Unix (and Linux) is excellent for this, given its multiuser capabilities, I can log in and start something from anywhere in the house or even work. Utilities such as `rplay', a network sound utility, or `speak_freely', an Internet voice chat utility, will improve this many times over.

While all this sounds like I'm just having fun (and to be honest I am), there is a much more serious side to the whole thing. For a start my home network provides an environment to test and an opportunity for me to learn about technology that will ultimately be deployed in the workplace. Secondly, it provides an environment where my wife can perform her work at home or in the office with little change. And finally, it gives my children a better computing environment than in any school I have seen, and yet also allows me to monitor what they are doing.

So what of the future, well there is lot still to do. You will notice that I haven't mentioned a web server. That is coming. The world's most used web server is Apache and yet again it is public domain. I've installed it, but haven't had time to configure it. Soon I will.

A more important learning item for me is to improve my connection to work. Currently there are some limits on what I can do, due to a firewall between me and work. The best way to get around this is via a Virtual Private Network (VPN) and I will be implementing this between home and work. This will provide an opportunity for me to experiment with it before I have to implement it for others at work.

Of course, even more fun, I'll be looking at installing a video camera within the network, and that will allow remote monitoring from anywhere! And no matter what, much of this software will improve. As an example Samba can now act as an Primary Domain Controller within an Microsoft NT environment, and I intend to do just, linking all my various Windows system in the manner Bill intended, but with open software. :-) It should also allow me to have a single password scheme across my home network.

You may wonder why I have gone through this list of my home system. While it is an impressive list (at least I think so), it goes to show what you can do with public domain and free software today. I would hate to try and calculate how much such a setup would cost if it was implemented with commercial software. At the same time it is aimed at encouraging people to get out and look at what you can do.

What I would like to do from here is to find out what others have done. I'd invite you to write (frank@ansto.gov.au) to me with details of your system, what you have implemented in your home (or where ever). I hope to put together a column in future editions of AUUGN with this correspondence, and I'll fill it out with more details of the software I have, how you can obtain and configure it.

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A Common Software Development Infrastructure

Robi Karp
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All software development projects use common software components. They may require a web interface, they may log data to files to be analysed later or they may interface to back end systems. In any company, there is usually more than one project implementing similar software components at the same time. The development efforts encounter the same problems and suffer the same bottlenecks.

Having pre-existing components at hand would allow new projects to be:

- developed more quickly as there is less to develop;
- developed more quickly as there is less to test;
- less risky as the common components would be an area of certainty having undergone rigorous testing already; and
- cheaper as less has to be done.

A common software infrastructure allows for rapid system development. Design and implementation of the new project would only have to focus on the problem at hand rather than having to try to deal with already solved problems, yet again. The new software would simply use the existing infrastructure. As this infrastructure grows to contain more components, the development cycle time for new projects decreases.

Consistency is another issue. It would be wonderful if all applications within a company produced log / audit / error messages that were of a similar format. If this were the case, then common tools could analyse those messages, import them into spreadsheets and word processors and automatically generate reports. One component provided by the infrastructure would be a logging mechanism. Having this ability would allow for analysis of application output as well as comparison of output from other applications. This, in turn, would allow application fine-tuning.

Having a reliably running system is mandatory. When problems arise in a new system the entire system reliability is questionable. It is all new and, hence, all possibly faulty. A common infrastructure limits the areas of doubt. It would be a given that the common infrastructure had been rigorously tested, deployed on other systems, and unlikely to have bugs. The system, as a whole, would inspire greater confidence having been built from reliable, proven building blocks.

When something goes wrong with a running system, it is usually up to the system maintainer to deal it. A common infrastructure spreads the load. While there will still be individuals responsible for maintaining systems, having common areas of the system means that more than one person has knowledge of those areas. Problems may be analysed more quickly and, hence, solved more quickly.

Beginning such an infrastructure does not even require a huge overhead. To make a beginning, components are taken out of existing projects. Using these components, and adding perhaps one or two other components, would suffice. As new projects come on line, components are added to the common infrastructure so that they are available for the future.

Porting software is always a major headache. New software typically uses specifics of systems that do not exist on other systems or programming languages. A common infrastructure can make porting much easier and, in most cases, completely pre-empt the headache. It would be desirable to have the common infrastructure available in several languages and many operating systems and platforms. Applications that used it could be deployed on new platforms far more easily, quickly and reliably than applications that didn't.

Some components of a common software infrastructure are:

- Error Handling Logging and Auditing. This provides consistent message, logging, auditing, error handling and data output. This, in turn, allows for common output analysis and data extraction tools.

- A Back End Interface. A consistent way to communicate with back-end, legacy, billing and any other systems.

- A Front End or Web Interface. This provides systems with a consistent user interface.

- Messaging (Middleware). Software systems often need to communicate with other systems sometimes on other machines. This component would provide a consistent way to pass messages around. It consists of smaller components such as socket, message queue and shared memory components.

- Database Interface. Most software systems require data to be stored somewhere. Most databases offer similar functionality. A common database interface would require methods such as:
  - StartTransaction
  - Update
  - Commit
  - EndTransaction
  - Access / Retrieve

The component itself would have sub-components that implemented the interface to specific database systems. If some new database were to be used then the application would not have to be changed. A new database-specific sub-component would be implemented and simply plugged in.

Once started it is easy to add components to the common infrastructure as they build on one another. In a short time an infrastructure would exist that had many high level components that could be plugged together to build new applications quickly and reliably. The only new parts to a system would be those that are very specific to that system.

Any large corporation usually has several parallel software development efforts in progress. These projects are tackling similar, if not identical problems. It would be advantageous to solve all of these problems only once. A software component infrastructure, to which all new projects adhered, would mean that those projects would be:

- developed more quickly;
- more reliable;
- more consistent in terms of output;
- more easily maintained; and
- consequently much cheaper to implement and maintain.

If a company is in the business of providing software systems to customers or using them in-house it would make a lot of sense, if not be an absolute necessity, to implement such a software infrastructure.

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Introduction to Linux

Con Zymaris
conz@cyber.com.au

History tells us that the modern basis of the Internet was the synthesis of the TCP/IP protocol suite with the Unix operating system, which was achieved in the University of California at Berkeley in the very early 80's. This combination produced an environment, which made possible open, distributed, team-oriented software development. Groups of very able programmers where now able to work in unison, to deliver software with the functionality and quality which had previously only have been achieved in the confines of large software development organisations.

In effect, Linux, which began on and is still evolving, within this environment, is the first major operating system to be created on the 'Net, and an example of just what can be achieved through collaborative world-wide development. Linux is both powerful and stable, yet runs on hardware which is probably sitting on your desk right now. It has always been popular with the technical crowd, simply because it works and is free. Through the years, it has acquired an extensive set of applications, networking services, a modern GUI and more.

Is free software any good?

('free' as in freedom)

The development basis of free software is very different from that of commercial software. By definition, commercial software vendors are primarily interested in your money. By comparison, free software exists to fill a specific functional requirement, which it most often does very well; simply, efficiently, and with minimal code bloat. New versions of commercial applications and systems are often developed with most effort directed towards adding more extraneous features (like talking paperclips) rather than eliminating bugs, as you would expect from a model which requires users to be (for revenue generation purposes) on the perpetual upgrade treadmill.

So who writes free software? Generally the same people who write commercial software (mostly as individuals, after hours). They do it to solve a problem at hand, and then continue development often to gain kudos from their peers.

Who uses Linux?

In short answer, almost every type of person and organisation. While it is true to say that many years ago, Linux was the exclusive preserve of the technical guys, nowadays, it is used by almost all groups with IT needs. Since Linux is available in a form, which encourages you to make copies for your friends, it is impossible to determine the current number of Linux systems in the world. The latest data from the International Data Group (Framingham, Mass.) indicates that approximately 6 million new Linux systems were installed in 1997. Compare this to the 3.8 million new systems running MacOS for the same year. Consider also that these figures are achieved with almost no advertising budget.

Why should you be interested in Linux?

The most likely method of introduction of Linux to most non-technical organisations is through the role of web and email server, in use externally (Internet) or internally (Intranet.) Linux is perfect for these roles. It has all the communications and server systems needed to operate in TCP/IP, Web and Internet Email and Workgroup environments, has high quality (free) firewalls available, and can run at very acceptable speeds on half the hardware NT

requires to perform these same tasks. Added to the fact that you would need to spend thousands to get NT into the same feature set for these roles, comes the analysis from a recent InfoWorld (US) column which indicated Linux could be installed in half the time (and effort) as NT, by a non-expert user.

The second excellent use for Linux is as a replacement for Windows 3.1 and Windows 95 desktops in organisations which cannot afford 'yet another round' of upgrades. Linux is considerably more robust (and secure) than either of these platforms. It will work acceptably on 486 level hardware with 12-16 Meg of RAM. Most importantly, it comes with distributed windowing software (the X-Window System) which can be combined with Windows-terminal servers such as Citrix Winframe, the Microsoft-Citrix Hydra/Picasso combination, NTerprise from Exodustech and many more. This will allow you to install and run on one, heavy-duty NT server all the latest and greatest resource-hungry desktop productivity apps your organisation requires, and display them on your legacy PC hardware workstations, each equipped with the zero licence cost Linux, in all their splendour. This has some wonderful advantages: no hardware upgrades; no need to purchase Windows95/98/NT licences for each and every desktop; you need only install and upgrade your productivity apps once (on the server) and not for each desktop; your users will be happy that their applications can run at the breakneck speed of the heavy-duty server; if mandated, your users will not be able to tinker with the desktop OS (Linux) as it can be made bulletproof against their fiddling.

'TITANIC' AFFIRMATION OF CAPABILITY

As a final example of the its power and flexibility, Linux was used to render the fantastic Computer Generated Imagery on the James Cameron film 'Titanic', the most expensive (and potentially the highest grossing) film of all time. This was done by Cameron's own CGI company, Digital Domain, who chose Linux over workstation platforms like SGI and NT.

HOW DO YOU GET LINUX?

Nowadays, numerous distributors have packaged Linux in what are known as 'distributions' These can be purchased through IT bookshops and retail software outlets, in multi CD-ROM format, which is much easier to get started with, than down-loading everything via the Internet. Prices should be around the $30-$60 mark. Alternatively, if you know someone who has a freely distributable Linux CD-ROM, borrow theirs. Due to the fact that Linux is of minimal or no cost, you have nothing to loose but to try it.

For more information, check out http://www.linux.org/

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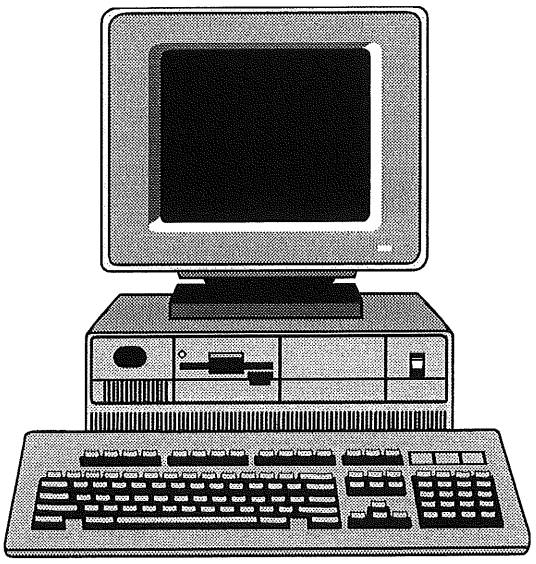

Linux as a Desktop Workstation Platform

Con Zymaris
conz@cyber.com.au

You may have heard recently that Linux makes an excellent file-server, web server and Internet Gateway. What you may not know is that Linux also makes a great personal workstation operating system, which often has advantages over its rivals like Windows, NT & MacOS.

Most people need a core of perhaps a dozen major application types (word processors, spreadsheets etc) available on a platform, for it to be of use. It's probably been a well kept secret, but Linux has probably all the serious business and personal productivity applications you may ever need. What's more, quite often these are available at no cost and in open source format. Here's a rundown:

OFFICE SUITES

Office suites are perhaps the most common requirement of most people who use computers as personal productivity tools. Linux currently has four main office suites from which to choose from. The main contenders are:

Linux Office Suite 99 (incl. Applixware 4.4.1):
Priced at USD$79.95, the suite includes a spreadsheet, word processor, presentation graphics, database, fax program and is designed to enable document exchange with Microsoft Office 97. The core of this suite is based on the mature Applixware product range, which is reliable and efficient, although not as polished as MS-Office 97. For more information, check http://www.suse.com/

Corel
Corel WordPerfect for Linux (List CDN$85) will perhaps become the most popular office suite for Linux, due to its brand-name recognition. If you've ever used any of the modern Windows or Macintosh word processors, you'll be right at home. This version has all of the features of WordPerfect for other platforms, including drawing and charting modules, auto-correct and spell-as-you-go highlighting, spelling and grammar checking, tables, mail merge, outlining, lists and style sheets. WordPerfect for Linux is the beginning of a full featured product range that Corel is releasing for Linux over the next few months. Eventually, they have committed to ports of all their mainstream apps like CorelDraw etc. WordPerfect for Linux is down-loadable from http://www.sdcorp.com/

StarDivision's StarOffice 5.0
StarDivision is perhaps the 'slickest' of the office suites for Linux, and of considerable interest to many potential users due to its 'no-charge' licence for personal use. Perhaps due to this slickness, it requires more resources than the aforementioned competitors. The product is also available for the Windows platform, and has garnered a substantial following in Europe (it's written in Germany.) It too has all the main apps you would expect from an office suite, and is down-loadable from:
http://www.stardivision.com/

KOffice from KDE
This is a new application suite, with spreadsheet, a couple of word-processors (general & scientific/document layout) personal organiser, presentation slide-show system and more. KOffice is open source freeware, and is targeted primarily for the KDE desktop environment (one of several for Linux.) It's perhaps the newest (and thus least complete) contender, but as with many open source software projects, holds solid promise for rapid improvement. Download from:
http://www.kde.org/

Email and News

Many of the office suites (Applixware, KOffice) come with their own email clients (POP/IMAP) which are quite useable. Alternatives are plentiful on Linux, which isn't surprising, as it's the first OS built via the 'Internet.' Many people use text based mailers like elm, pine and mutt, which are powerful, but complex for beginners. One of the more popular GUI mailers is the IMAP/POP client that ships with Netscape Navigator. Netscape also provides for a convenient Usenet news-reader too.

Web Browser

Netscape Navigator has been on Linux for a few years, and from the sounds emanating from Mozilla.org (the central development site for Netscape Navigator) Linux is the development platform of choice for developing new versions of Navigator on. Navigator looks and works the same on Linux as on Windows, and just like on Windows, it's open source and free. http://www.netscape.com/ for the latest versions.

Specialised Apps

Graphical Manipulation Apps
The GIMP is the GNU Image Manipulation Program, a freely distributed application suitable for such tasks as photo retouching, image composition and image authoring. In short, it has pretty much all the capabilities of Photoshop 5 for Windows/Mac (minus some features like colour separations) and it costs nothing to acquire. Details at http://www.gimp.org/ Another site with plenty of useful pointers to Linux based graphics apps is http://www.graphics-muse.org/linux.html/

Scientific Applications on Linux
It wouldn't surprise anyone to find out that there are literally thousands of scientific applications available for the Linux platform. In fact, there's a whole website devoted to the area. Scientific Applications on Linux (http://sal.kachinatech.com/) is a collection of information and links to software that will be of interest to scientists and engineers. Amongst the major applications areas it covers are:

- array-oriented & linear algebra systems, statistics, number theory,
- numerical analysis, parallel computing, visualization, electrical,
- chemistry, biology, artificial intelligence, physics & astronomy.

A quick search with your favourite websearch tool will reveal several major sites which list thousands of general and special purpose Linux apps. Furthermore, the Linux space is undergoing explosive growth, and the number (and quality) of these apps keeps improving at a rapid rate.

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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!

The 1999 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 30th July 1999

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?

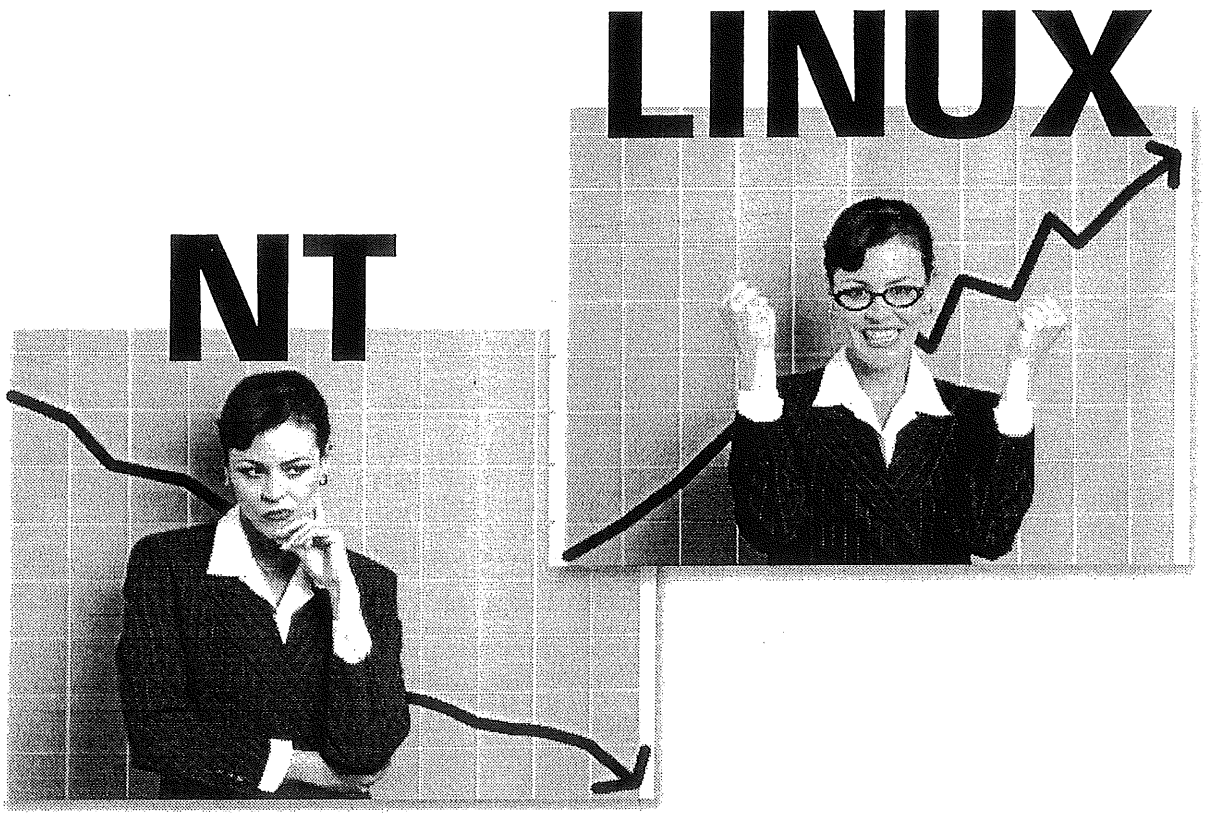
The work will be focussed on software which relates to computer communications, networks, operating systems, or similar. If you are not sure whether your work may qualify, mail:

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

Close the gates Bill, Linux has arrived!!



Do you have these skills: LINUX, SUN/OS, SOLARIS, DEC, DIGITAL, HP-UX, DG-UX, AIX, SCO, IRIX, OSF1, UNIXWARE, DR5/NX, TRU64.

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QAUUG CTC Report

Mark White
Mark.A.White@compaq.com

AUUG's Queensland Chapter (also known as QAUUG) held it's annual Chapter Technical Conference on April 22nd at Brisbane's Park Royal Hotel. Many of the topics held an Open Source flavour, although it was a non UNIX-specific talk which won recognition as best presentation of the day. Around 50 people attended, combining with the overall quality of the speakers to ensure one of the more successful regional conferences in recent years. Stallion Technologies - a long-time supporter of the open systems community in Queensland - were the event's sponsor.

After a few opening words from David McCullough, conference chair, the audience welcomed our keynote speaker - Dr. James Clark, Senior Vice-President of the Santa Cruz Operation Inc. (SCO). Dr Clark is responsible for SCO's operation in the Asia-Pacific region, and presented on a couple of timely topics: firstly, SCO's joint initiative (with Intel, IBM, Sequent & Compaq) for a common UNIX on Intel's forthcoming IA-64 architecture (a.k.a "Merced"), and secondly on SCO's visibility of and contributions to the Linux community. SCO's often regarded as an "enemy" of Linux, and Dr Clark was able to put this ill-informed perception aside in a discussion on SCO's participation with Linux International, it's incorporation of Linux binary-compatibility in the UnixWare 7 (System 5 Release 5) kernel, and contributions to the Open Source community. As long as Linux is beating Microsoft to the desktop and server users, it is (in SCO's eyes) making a valuable contribution to UNIX and should be encouraged.

Next up was Peter Dettori, who described his work on "Itsy" - Compaq's handheld device developed by the (formerly Digital Equipment Corporation) research group in Palo Alto. Peter described the hardware features and his experiences in porting Linux to the device (replacing a port of Windows CE!). An interesting innovation, and all I can say is I've never seen a smaller (but totally functional, including audio) implementation of "Doom".....

Also on the subject of Linux porting was Greg Ungerer, who's been working with Moreton Bay Ventures to implement Linux on Motorola's ColdFire processor. While the ultimate goal is a platform for embedded network appliances, Greg took us step by step through the porting process, including his experiences with Motorola's development kit.

Michi Henning's talk - entitled "Computing Fallacies", ultimately emerged as the crowd's favourite for the event. A self-admitted chance to blow off steam, Michi illustrated his frustrations with the current state of software development education, thinking, and implementation. This truly magnificent and thought-promoting discussion dominated discussions over lunch, and I hope it will be seen by a larger audience at this year's national conference in Melbourne. Michi's was ultimately voted the best presentation at the end of the day in an all-but-unanimous decision.

QAUUG stalwart David Hughes was up next, taking the audience through the next-phase design of his ever-popular DBMS engine MiniSQL. With one exception (and being in Sweden as a pitiful excuse Bambi!) David's presented at every single QAUUG event since their inception more years ago than most of us care to remember, and was a crowd pleaser again this year. STC's Nishanth Chandran spoke next on the Java cryptography architecture, and was able to present complex theories and concepts involved to a general audience quite well.

Our next special guest was Richard Keech from Cybersource in Melbourne – Red Hat Software's only accredited support partner in Australia. Richard posed a question on everyone's minds, namely "Will Linux Rival Microsoft?" in a balanced but ultimately open-source positive way. Richard was a good balance with the final presentation of the day, from self-confessed marketriod Mark White. Mark's topic was "Linux in Vendorland" - in other words, how the market analysers and major vendors really see Linux, and what needs to happen for it to be really taken seriously as a commercial operating system. As with all the other presentations, these generated good discussions which continued in the nearby bar well after the conference closure!

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The success of QAUUG99 has highlighted the depth of innovative open source development and implementation being undertaken in Queensland, and attendee feedback forms indicated exceptional value. In addition to the annual conference, QAUUG holds regular monthly meetings; if you aren't already on the mailing list for these and other activities all you need to do is send a message to majordomo@auug.org.au with "subscribe qauug" in the message body. A congratulations to all speakers involved, and also thanks to Rick Stevenson and David McCullough for making the event possible.

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AUUG INC.
UNIX® and Open Systems Users
Queensland Chapter

Member Services Update:

New Online News Service

EXCLUSIVE ON-LINE NEWS SERVICE PROPOSED FOR AUUG MEMBERS.

AUUG in partnership with IDG Communications, the world's foremost IT publisher, will be offering members a comprehensive UNIX information on-line news service. The free service will be available daily or weekly depending on your preference and adds great value to your existing AUUG membership.

Run by the ComputerWorld division of IDG, the service will pull content from IDG's global resources of more than 280 publications and from all its local magazines and services.

The content is specifically tailored to your information needs. AUUG will be defining the areas of interest that the tailored email service will be based upon. As a subscriber, you will receive a daily or weekly email with headlines and summaries of the stories pointing back to the full text of the article on a dedicated web site. A fully searchable archive of news and feature stories will provide a comprehensive and continuously growing information resource for AUUG members.

The service has strict privacy policies and your email address will only be used for this specific news report. You can subscribe or unsubscribe at any time.

This service brings AUUG closer to our members and we are pleased to be able to offer this to you.

To join the service send an email to auugnews@email.idg.com.au and include the phrase join auugnews in the body of the email.

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News from the AUUG Business Manager

Liz Carroll
busmgr@auug.org.au

Hi All,

SYDNEY MORNING HERALD

By now you are probably all aware that AUUG is running a fortnightly column in the Sydney Morning Herald. (Thank you to everyone who has contributed to date.) As such, we are always looking out for good articles. Should anyone wish to contribute please email me your article for submission. If you are unsure whether something is appropriate, an outline of the topic will be sufficient and I will let you know whether it will be okay. Following is a brief outline of the type of article the SMH is looking for:

"The Sydney Morning Herald is targeting its' IT section to business, running it after the business section targeting readership at CEO's down. The column is a UNIX column (rather than an AUUG column). SMH audience also runs 80-90% of their IT section in the Age in Melbourne. UNIX Column - 600-700 words with final credit to writer and pointer to AUUG Web site."

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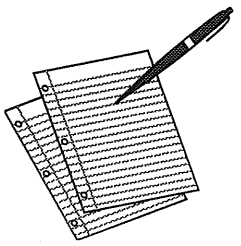
SYSTEMS MAGAZINE

In addition to the SMH, AUUG is also running articles in Systems Magazine (copies of which AUUG members are now receiving). As such, articles of approximately 1,700 words would also be appreciated.



Should anyone have any questions, please feel free to email me or call on 02 9858 4542. I look forward to reading your articles!

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Conference Update:

Open Source - AUUG'99

David Purdue
David.Purdue@auug.org.au

Well I for one am looking forward to AUUG'99. Planning is well underway, many papers have been submitted and the program is taking shape.

We are pleased with the range and quality of the invited speakers that are coming to the conference.

Andrew Tridgell is well known to Australian audiences. As the primary developer and project leader of SAMBA, Andrew will be giving presentations on both the Server Message Block protocol and the trials and tribulations of managing a large open source project.

Adrian Cockcroft is Sun Microsystems foremost performance expert. Adrian will be running a tutorial on how to get the last few percent of performance from your Solaris systems. Adrian will also be talking about the state of tools available for performance measurement and improvement.

John "maddog" Hall is the Executive Director of Linux International. He has spoken at AUUG before, and apart from being a strong advocate for the use of Linux he is an interesting and entertaining speaker. I hope he brings more interesting toys.

Theo de Raadt is the leader of the OpenBSD project. OpenBSD is a derivative of the BSD 4.4 Lite operating system that concentrates on high security and strong cryptography. Theo will be talking about is particular approach to managing an open source project.

Robert Hart is the support manager of Red Hat Software. Robert will be talking about Linux in the commercial world. Red Hat now offers commercial support for Linux, and Robert will discuss how this changes the equation for commercial users.

So mark the week of 6-10 September in your diary and I look forward to seeing you there.

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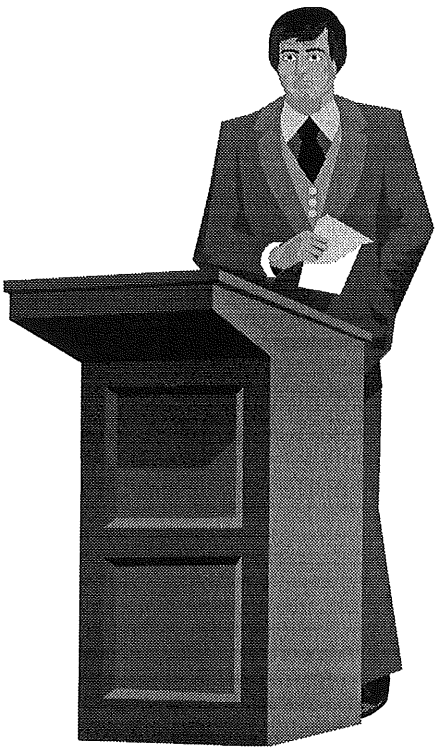
You can keep up to date with all the latest news from AUUG'99 through the conference website at: http://www.auug.org.au/winter/auug99



Conference News:

What's on at USENIX

Full tutorial and technical session programs, and online registration, are available at http://www.usenix.org/events/ for the following:

USENIX ANNUAL TECHNICAL CONFERENCE
June 6-11, 1999, Monterey, California
This year the tutorial program has been expanded to three days.

John Ousterhout of Scriptics Corporation will provide the keynote. And included again is the FREENIX track devoted to providing top-quality presentations on the latest developments and interesting applications in open source software.

Recently added to the schedule:

3RD WINDOWS NT SYMPOSIUM
July 12-14, 1999, Seattle, Washington
Paper submissions due: February 23, 1999

Co-located with:

LISA-NT--2ND LARGE INSTALLATION SYSTEM ADMINISTRATION OF WINDOWS NT CONFERENCE
July 14-16, 1999, Seattle, Washington
Co-sponsored by SAGE, the System Administrators Guild
Submission proposals due: February 23, 1999

8TH SECURITY SYMPOSIUM
In cooperation with The CERT Coordination Center
August 23-26, 1999, Washington, D.C.
Paper submissions due: March 9, 1999

2ND CONFERENCE ON DOMAIN-SPECIFIC LANGUAGES
October 3-6, 1999, Austin, Texas
In cooperation with ACM SIGPLAN and SIGSOFT
Paper submissions due: March 22, 1999

2ND USENIX SYMPOSIUM ON INTERNET TECHNOLOGIES AND SYSTEMS
October 11-14, 1999, Boulder, Colorado
Co-sponsored by IEEE Computer Society Technical Committee on the Internet
Extended abstracts due: March 25, 1999

Just added:

LISA '99--13TH SYSTEMS ADMINISTRATION CONFERENCE
November 7-12, 1999, Seattle, Washington
Co-sponsored by SAGE, the System Administrators Guild
Extended abstracts and Invited Talk Proposals due: May 25, 1999

TCL/2K: 7TH USENIX TCL/TK CONFERENCE
February 14-18, 2000, Austin, Texas
Extended abstracts due: September 1, 1999

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The USENIX Association supports user groups worldwide. We have recently inaugurated several programs to further this goal:

CO-SPONSORSHIP OF CONFERENCES & INTERNATIONAL AFFILIATE PROGRAM

There are many different models for affiliate membership or co-sponsorship; contact the Executive Director at ellie@usenix.org

INTERNATIONAL SPEAKERS PROGRAM

http://www.usenix.org/membership/intnl_speakers.html

USER GROUPS ON THE USENIX WEB SITE

http://www.usenix.org/membership/ugs.html

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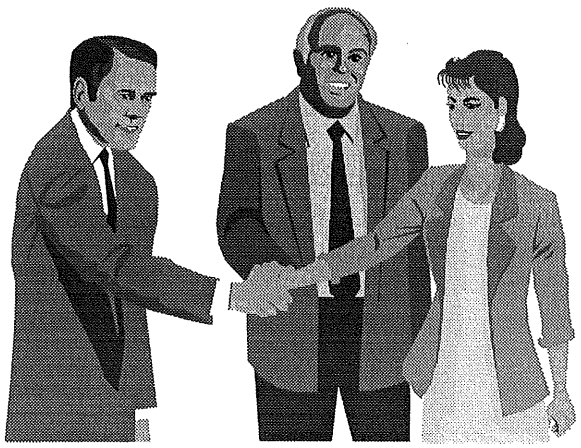

Sponsorship Opportunities:

Open Source AUUG'99

AUUG'99 Conference
September 8-10, 1999
Carlton Crest Hotel
Queens Road
Melbourne VIC Australia

THEME: "OPEN SOURCE"

The 1999 AUUG winter conference will be held at the Carlton Crest Hotel, Queens Road, Melbourne, Australia, between September 8th and 10th.

The conference will be preceded by two days of tutorials, on September 6th and 7th.

Information on papers can be found at the AUUG website :

www.auug.org.au

There are also many advertising and sponsorship opportunities available for your Organisations. Information is available from the AUUG business manager.

To take advantage of these, please contact:

Liz Carroll
AUUG Business Manager
Phone: 02-9858-4542
Email: busmgr@auug.org.au

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Carlton Crest Hotel
Melbourne
8-10 September 1999

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Further information is available from the AUUG Business Manager, Liz Carroll.

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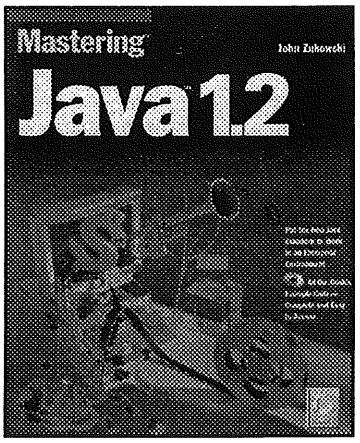

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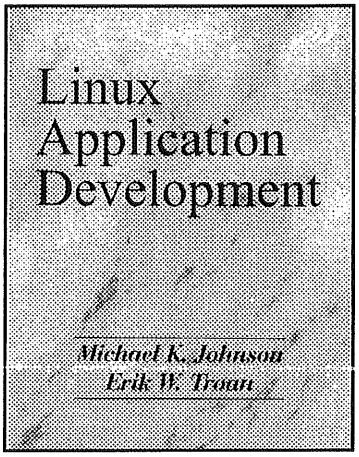

Linux Application Development

Michael K. Johnson and Erik W. Troan

This practical reference guides programmers developing Linux applications or porting applications from other platforms. Linux is fundamentally similar to Unix—therefore, much of the book covers ground familiar to Unix programmers—but this book consistently addresses topics from a Linux point of view. The aim throughout is to provide the detailed information you need to take full advantage of Linux.

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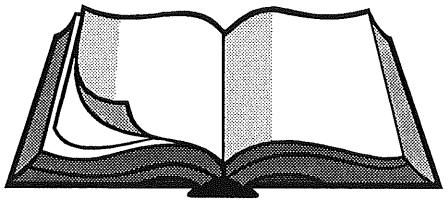

CRACKING DES: SECRETS OF ENCRYPTION RESEARCH, WIRETAP POLITICS AND CHIP DESIGN

Electronic Frontier Foundation, 1998,
O'Reilly & Assoc.
ISBN 1-56592-520-3

Reviewed by:
Mark Neely
mpn@infolution.com.au

When I first picked up this book, I was expecting a more detailed explanation of DES and other encryption techniques, plus some "cloak-and-dagger" insight into the behind-the-scenes politicking performed by lobbyists and technologists alike over the free access to demonstrably secure encryption technology.

Unfortunately, it turned out to be a fairly dry read.

Although the book is quite technical, most of the technical information relates to the design of the Electronic Frontier Foundation's "DES cracking" PC and the accompanying source code of the software they used to do the cracking.

The book contains the full chip design specifications and board schematics, as well as the full source code for the custom chip, a chip simulator and the "cracking" software.

All the source code is printed in a special format so that it can be easily scanned, converted to ASCII and then compiled. An entire chapter is devoted to explaining how to do this. The reason why the source code is included in scannable format is quite straightforward - US laws prevent the export of almost all cryptographic software (it is classed as "munitions"). However, thanks to the US 1st Amendment - Freedom of Speech - it is possible to legally publish the source code in the US and then export those books.

EFF set out to design and build a "cheap", custom encryption breaking computer as part of its efforts to discredit the US government's "endorsed" Data Encryption Standard (DES), which it alleges is no longer secure in today's computing environment.

It also set out to undermine one of the chief arguments put by those supporting government mandated "backdoors" in encryption products - that existing DES encryption technology is so strong that it would take thousands of years to break a single message encrypted using a 56 bit DES key.

EFF managed to prove both points conclusively, after its DES Cracker (built for around $US200 000) demonstrated that DES could be "brute force" cracked in a matter of days, not years.

Certainly the book was an eye-opener, in terms of the mathematical weaknesses inherent in existing, government endorsed cryptographic solutions. It also offered some withering commentary on the US government's justifications for promoting, on the one hand, a demonstrably insecure crypto system while, on the other hand, attempting to bully vendors of stronger, more robust crypto systems into including stealthy "key recovery" mechanisms in their products.

Anyone interested in chip/board design - especially for parallel computing environments - and low level encryption validation/testing will certainly benefit from this book, but if you are looking for a casual read on secure cryptography or the political controversy it creates, you are better off looking elsewhere.

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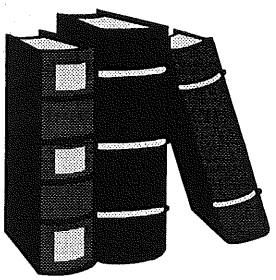

LINUX DEVICE DRIVERS

Alessandro Rubini, 1998,
O'Reilly & Assoc.
ISBN: 1565922921

Reviewed by:
Craig Macbride
craig@amarok.glasswings.com.au

This book is clearly structured and is organised in a very logical order. It starts by introducing the basics of the Linux kernel, then goes into the details of building and running modules in the kernel, character drivers and debugging. Having covered the basics, there are several chapters which delve into further details of character drivers, timing issues, memory management, hardware management, block drivers, DMA, network devices and the various peripheral buses that a programmer might encounter.

All Linux platforms are covered, not just the PC versions. Knowledge of C and Unix are obviously assumed, but all the Linux kernel specifics are laid out early on. This includes sections on the mechanics of compiling and loading kernel

modules, version dependencies in Linux, registering symbol names in the kernel and so on.

The book is well cross-referenced. Where a topic has related topics, relevant pointers are included, making it easy to plunge into a chapter of interest and also find related information.

Each chapter ends with a quick reference section which lists the kernel functions, variables, macros and /proc files that were mentioned in that chapter, along with a short description of their function. This makes following the technical discussion a more fluid process, as you do not have to refer back to previous chapters.

The writing style is clear and the book contains plenty of sample code demonstrating the kernel programming concepts discussed. Unfortunately, some of the hardware interface basics likely to be encountered by the device driver programmer, such as parallel ports, are covered in limited detail, while other hardware, such as SCSI controllers - which I was particularly interested in - is barely mentioned.

All in all, Linux Devices Drivers provides useful information, in a well organised and written format, for anyone interested in writing Linux device drivers. This is one of the best technical books I've read in a long time. It even has a decent index.

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From the pages of unigram·x

SUN WILL BE ON SAFARI BY MID-2000

By William Fellows

Sun Microsystems Inc says its next-generation Serengeti servers, supporting up to 1,000 CPUs will now ship by the middle of next year. The servers will use Sun's next-generation 600MHz UltraSparc III RISC microprocessor. The 'Cheetah' SPU has taped out and Sun expects to have silicon by the end of the month. It has 25 million transistors and is done in 0.18 microns.

Last July, Sun had been anticipating Cheetah by year-end 1998 and servers by the end of 1999, so there has been some slippage -- which the competition is sure to highlight -- although it's not significant compared with industry norms. It give rivals an opportunity to better sell against Starfires which will be getting long in the tooth by then. Sun appeared to be having a problem with a chipset to support Serengeti's next-generation I/O subsystems, but the chipset has now been delivered, the company says.

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RED HAT LINUX 6.0 LAUNCHED, SCALING TO 8-WAY

By Nick Patience

Red Hat Software Inc has released the next major cut of its version of Linux and the company is maintaining its focus on the server side with increased scalability, while taking whatever it can get of the desktop Linux market at the same time. As usual, Red Hat will not charge for the software beyond the cost of packaging and distribution as its business model relies on the support and services around Linux to make a living. It also relies on the open source community to develop the operating system, which it tweaks and supplements with tools to make it easier to use.
Red Hat Linux 6.0 will be announced on Monday, April 26 with shipment scheduled for May 10. The current version, 5.2 was released in November 1998. The major new feature this time will be increased scalability through support for symmetric multi- processing. Red Hat co-founder and chief executive Bob Young, resplendent in his own red hat, says this version will scale all the way to 8-way and will start to taper off at 12- and 16-way. The 5.2 cut realistically only made it to two processor support. The Linux kernel of the OS is 16Mb and the whole thing will take up 400Mb of disk space.

The 6.0 cut supports the KDE and Gnome user interfaces and the GTK graphical libraries on which they are built. It also supports the GIMP graphics manager and includes the Red Hat Package manager. Young is reluctant to talk about GUI or library wars within the Linux community - the company was recently accused of trying to break out on its own on the user interface front, ignoring the calls for standardization in the Linux community. But he fully supports the standardization efforts and claims his company will probably be the first to implement the Linux Standards Base (LSB); an initiative by the major Linux distributors (Caldera, Red Hat, VA Research and so on) to standardize on a single version of the Linux kernel and OS libraries. It is expected to get underway within 6-12 months. However, Young notes that the issue of the GTK libraries for instance, is in danger of becoming the Linux equivalent to the Unix spat over Motif. He says there needs to be choice over libraries, as the open source development model will ascertain which ones work and which ones do not.

Young notes that while his company's concentration is on the server, control of the desktop is crucial to the small OS's future. Right now the desktops that are vulnerable to Linux are the dedicated machines such as terminals in hotels and retail outlets. In fact Red Hat's rival, Caldera Systems Inc recently secured a 4,000 desktop order form a major hotel chain - exactly the kind of applications the network computer crowd was supposed to dominate, but never did. That will be the limit of the desktop penetration until major consumer desktop applications such as Microsoft Office, Intuit's TurboTax and the like get ported over, says Young. As helpful to the cause as Corel Inc's early port of WordPerfect to Linux is, "users don't buy PCs to run WordPerfect," he says. Red Hat currently employs about 120 people in "the tobacco fields of North Carolina" as Young describes its Research Triangle Park home.

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HP READIES INTERNET OPERATING SYSTEM

Hewlett-Packard Co is set to reveal a second "Info Utility" technology spawned by its HP Labs next month as an internet operating or inter-operating system, the company claims. It is expected to incorporate the Simple Service Discovery Protocol which HP recently demonstrated for use as the standard device-discovery method for Microsoft Corp's Universal Plug and Play mechanism its Sun Jini-killer.

The new software will, HP says, 'virtualize' all resources on a network. Instead of an application talking to a specific piece of hardware, HP envisions an intermediary layer of software which sits between the application and device registering every resource on the network. The hardware tells the service it is available plus the resources - memory, power and I/O - it offers. Applications register the resources they require. The software allocates resources accordingly. Simple Service Discovery Protocol is to be used with HP's own JetDirect print server work as a base point. It enables simple device installation over a network, with the protocol enabling devices to be

automatically discovered with minimal user effort.

HP said it would be using the standardized protocol within future JetDirect and Web JetAdmin products but would also be working with Novell Inc's NDPS distributed print services, and with Sun Microsystems Inc on Jini. Web QoS service monitoring software was the first technology out of the lab. HP is setting great store by its ability to write the second chapter of the internet through info utility technologies.

IBM To Offer 8-Way & 16-Way Power3-II SP Nodes

By Timothy Prickett Morgan

Although the details are yet unclear, rumor has it that IBM will offer 8-way and 16-way SMP nodes for its RS/6000 server line using the forthcoming Power3-II chip. Currently, IBM offers two-way SP "Winterhawk" nodes using the 200MHz Power3 chip, which is due to be replaced by the Power3-II chip by the end of 1999 or early 2000. Power3-II, depending on who you ask, will run at 300MHz or 400MHz, with the latter more likely as IBM steps up clock speeds a little more aggressively than it has in the past to catch up with Compaq, Hewlett-Packard and Sun Microsystems. Current plans call for IBM to deliver new "Nighthawk" nodes, which can have 2, 4, 6 or 8 processors, by the end of the year. Last year, when the Power3 43P model 260 workstations and servers were announced, IBM said it would deliver four-way Power3 workstations and servers in the September-October timeframe. Whether or not it will use the Nighthawk nodes as the basis of new RS/6000 server motherboards remains to be seen. It is also unclear if the Nighthawk SP nodes or the forthcoming RS/6000 workstations and servers will use the existing Power3 chip or the Power3-II follow-on to it. If IBM can get early yields on the Power3-II chips, which use its CMOS-7S copper chip process, both the Nighthawk nodes and the RS/6000 motherboards will obviously use the Power3-IIs. During 2000, IBM will put debut SP nodes, called Nighthawk-IIs, with up to 16 processors. Again, it is unclear as yet if these cards will end up as the basis of motherboards in the RS/6000 server line.

That IBM has taken so long to deliver four-way processing for the Power3 line is somewhat remarkable, especially given that IBM was among the first vendors to offer four-way 64-bit RISC processor motherboards (in this case, in the AS/400 line in 1995) and has long since perfected the four-way motherboard in the RS/6000 and AS/400e Apache and Northstar server lines. It looks more like IBM is, for whatever reasons, controlling the release of technology rather than just building everything it can and letting the market decide. (Such an approach is an anathema to Big Blue, which for most of its 35 years set the pace in server technology and, as such, is unused to having customers and competitors set the pace. But it looks like IBM's Unix division, under the stewardship of Rod Adkins, is changing its spots and getting aggressive about releasing technology as soon as possible.) While IBM will probably ship four-way and eight-way Power3-II motherboards for use as Nighthawk nodes in SPs and as the basis for its RS/6000 servers before the end of the year, the 16-way Nighthawk-II nodes and server cards will likely be held back until mid or late 2000. One early customer, Lawrence Berkeley National Laboratory, expects to upgrade an RS/6000 SP Power3 supercomputer that it just bought last week with the Nighthawk-II nodes using Power3-II processors by no later than December 2000

HP Announces Worldwide, 24/7 Support for Linux

Objections to open source software on the grounds that it lacks commercial support are wearing thinner and thinner. Hewlett-Packard Co is the latest titan to announce support services for the open source operating system Linux. HP will provide around-the-clock, worldwide support for Linux systems and applications. The company promises a maximum two-hour response time and immediate response for critical calls on multivendor Intel-based platforms.

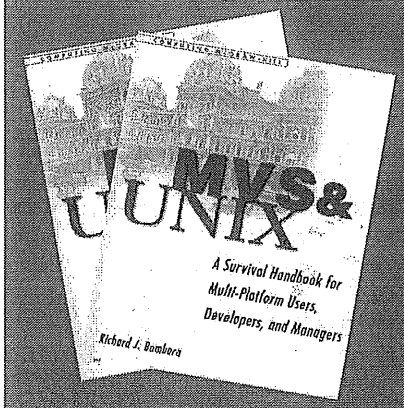
The services are to be delivered through HP's Electronic Support Center and Response Centers. Customers will get unlimited, toll-free, phone-in software assistance; a choice of response time frames; remote support by HP engineers; access to a database of product and support information from various vendors; and Linux training for system administrators. Linux distributions from Red Hat Software Inc, Caldera Systems Inc, Pacific Hitech Inc and SuSE Holding AG are supported now. In future, the company intends to add support for IA-64 architecture and Apache web server.

Apple's Changes to Public Source License Cautiously Approved

By Rachel Chalmers

Changes to Apple Computer Inc's Public Source License (APSL) have created a favorable first impression among members of the open source and free software communities. Debate is, however, still under way. Bruce Perens, one of the most outspoken critics of the original APSL, writes: "There is still a few days more of public online discussion being carried out before either OSI [the Open Source Institute] or myself will give their final call, because we want to be open to objections from others in the free software community."

Apple has removed one clause that prevented developers from shipping APSLed code to countries covered by US export restrictions. The company also eased up on its right to terminate the license at any time. This provision has been the principle point of contention. Perens praised



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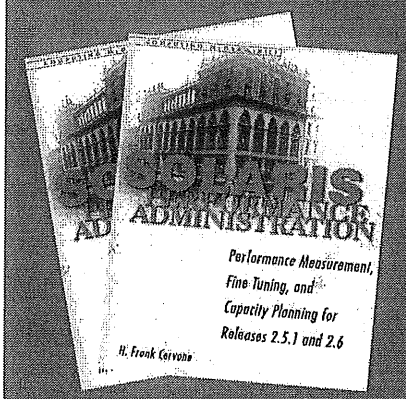

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the company for its prompt and thoughtful response to community concerns. "My first reading did not give me anything to object to and impressed me very favorably with the responsiveness of Apple," he writes; "they really did their best to address our criticisms."

✧ ✧ ✧

NOW SGI TAKES OPENVAULT OPEN SOURCE

Continuing to pursue alternative business models for some of its software to relieve development costs and free code from effective captivity, SGI last week released its OpenVault storage area network management software to the open source community. The OpenVault APIs enable third party applications to manage multiple tape libraries and silos at a high-level and provides media management services. SGI counts Legato, SpectraLogic, Exabyte and ADIC amongst its OpenVault licensees. SGI which has also said it is creating its own Linux distribution, has already released some of its OpenGL graphics library to open source.

✧ ✧ ✧

WINDOWS 2000: BAD NEWS IS GOOD NEWS

Word is leaking out of Microsoft Germany that Windows 2000, now more than a year late coming to market, will not be released during 1999. Microsoft is mum on the subject thus far. But it is probably not much of a coincidence that last Wednesday when the Windows 2000 delays hit the wire was the same day that Microsoft announced Service Pack 5 for Windows NT 4.0. Service Pack 5 includes various Y2K updates that didn't make it into Service Pack 4, which is only a few months old, as well as changes and performance enhancements to dial-up networking, clustering and DHCP serving, among other things. Every month that Windows 2000 is late and every stumble Microsoft makes in getting the product to market, which is currently in beta 3 and more or less stable in a workstation implementation but still not working properly for server configurations, is a month when Unix and Linux vendors can get out there and compete hard for new business against Microsoft. The key for Unix and Linux vendors is to get as much momentum going now, before Microsoft gears up the marketing machine in 2000, when both Windows 2000 and Merced workstations and servers will be shipping. Now is not the time to hesitate, but to strike.

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SUN SET TO ABANDON JAVA STANDARDIZATION PLAN

By Dan Jones and Tom Hughes

Sun Microsystems Inc appears to be considering alternatives to the International Standards Organization's Publicly Available Specifications process for standardizing Java. The sticking point has been the standards body's insistence that it take full control of the future development and maintenance of the language, shutting out Sun's control. Speaking at the Java Enterprise Solutions Symposium in Paris Javasoft president, Alan Baratz said that Sun was examining its options. "We could go to other bodies," he said.

The ISO has changed the rules on PAS proposal submissions - PAS is not usually a channel open to commercial organizations - and Baratz suggested that the outcome of these changes would mean that the company would have to pass the ongoing definition of the platform to ISO. Baratz suggested that Sun wanted to retain some control over the language it piloted. "We invested money and effort in the ISO process," Baratz said, "Sun was a little naive...then we saw Microsoft spending several million dollars to block the initiative." He concluded that "commercial companies are unlikely to use this process in the future."

If Sun does abandon its PAS submission, it is not necessarily the victory for Microsoft which it might seem. Although Microsoft has long fought Sun's right to use the PAS process as a vehicle for Java standardization, Sun may be in a better position to retain control over the future of Java through its newly-created Java community license model. Sun CEO, Scott McNealy has always maintained that Sun should retain stewardship of Java, and even Sun's biggest Java ally privately admits such a move wouldn't come as a shock.

✧ ✧ ✧

SUN RELEASES TOOL TO MAKE LINUX APPS RUN ON SOLARIS

By Rachel Chalmers

Sun Microsystems Inc has contributed software to an open source development project that should let users run Linux applications on Solaris 7 without having to modify them in any way. Sun will also provide free tools to make it easy for Linux developers to check that their source code will run on Solaris. The open source effort, lxrun, ensures binary compatibility, while Sun's free development tools will offer source code compatibility when they ship for free in June. Patrick Dorsey, Sun's product line manager for Solaris, explained: "This helps if there are any syntax issues or small incompatibilities. Solaris and Linux are already pretty close to each other. What this tool does is make that inherent compatibility even easier."

As for lxrun, it was originally developed for use with SCO UnixWare. Sun engineers have been collaborating with the current open source code owner, Steven Ginsberg: "We worked with him and contributed our enhancements back to the community," Dorsey explained. Available immediately, lxrun for Solaris Intel Platform Edition runs Linux applications unmodified alongside Solaris apps. "We see benefits for both developers and for users," Dorsey said, "developers

get access to both the Linux and the Solaris user base - more seats and a larger market size." And Sun, of course, gets access to Linux application development resources, though Dorsey plays down this angle: "Solaris is pretty robust in terms of application capture," he says, before conceding, "but there are applications that have been hacked that will benefit Solaris as well."

Barbara Kay, product line manager for desktop software, says the biggest winners will be the users. "We certainly are aware that new development is going on the Linux space," she says, noting that there is particular interest in KDE and GNOME. "For users that are not looking for a cross-platform environment like the one we ship, a whizzy interface like KDE or GNOME might be just what they need." But the real strength of Linux over Solaris is the availability of games, Kay reveals. "If you've got a developer who's been doing heads-down coding for hours, they might want to take a break to use the latest greatest games," she chuckles. "If games are available on Linux now you can get to them and use them on your Solaris workstation. Managers like making sure that kind of thing is available to their creative end users."

✧ ✧ ✧

Correction: Digital CFS Not Based On NFS

Insiders at Digital familiar with the evolution of its Cluster File System for Tru64 Unix have taken issue with the common characterization of CFS as an offshoot of Sun's Network File System. They say this is not correct. Tru64's CFS is based on the Transparent Network Computing file system technology that Digital licensed from Locus Computing Corporation (now part of Platinum technology). TNC, they say, provided a true single system image for files and processes through a clustered system, capabilities that NFS did not have. (CFS can apparently mount NFS, however.) They also remind us that the same TNC technology was also licensed by Tandem for its Unix product line. In 1996, after Digital obtained its license, Tandem acquiredthe exclusive rights for future development of the TNC technology from Platinum, and almost immediately afterward was eaten by Compaq. Not long after that - at least in computer years - Compaq ate Digital and found itself with two separate implementations of the same technology.

✧ ✧ ✧

DG Targets McKinley for Its 64-bit ccNUMA Systems

Data General Corp will be upgrading its SCI ccNUMA interconnect to a fully-switched system by year-end enabling it to connect 64 processors in a single node, up from 32 currently. Its DG/UX will continue to be the operating system of choice on its IA-32 systems, but DG will likely use the IBM-SCO-Sequent Montery/64 Unix on IA-64 systems. That's if it can get what it wants out of the Monterey/64 team, which is a guarantee on support for DG's own clustering and ccNUMA topologies. Until then it's not going to go public with any notion of support for Monterey64. In any case, it will only use Monterey/64 on IA-64 systems. DG says it will port its ccNUMA technologies to IA-64, but is targeting the second generation part, McKinley, not Merced.

✧ ✧ ✧

Sun Promises 100 Teraflop Computer by 2000

Sun Microsystems Inc is promising a 100 TFLOPS supercomputer by the year 2000. Director of the science office at Sun, John Gage, speaking at the Java Enterprise Solutions Symposium in Paris, France, said that the new machine would be unveiled by year-end. Sun has already promised its Serengeti servers using the UltraSparc III "Cheetah" processors by mid-2000.

✧ ✧ ✧

Linux Hype Driven by Anti-Microsoft Feelings Says Report

Less than 5% of Meta Group's clients expect Linux to have a significant enterprise role within their organizations in five years time. Meta says this demonstrates that positioning Linux against Windows NT is pure hype. It is mostly driven by antipathy towards Microsoft Corp not in a belief about Linux's enterprise qualities, Meta says. It expects the Linux market will "inevitably fragment as enterprise vendors incorporate such functions into the shareware base." It identifies Linux's greatest problem as the lack of mission-critical support, which is unlikely to emerge from the shareware market. Meta recommends investing in Linux as an embedded or dedicated appliance operating system.

✧ ✧ ✧

Linux Faster Than Solaris in Some Cases

The notion that Linux on Sparc is faster than Solaris on Sparc lingers. Sun Microsystems Inc has apparently been asking benchmarkers "why?" Linux people have reminded us that the problem with benchmarks is that you get what you measure for. It's likely, they say, that Red Hat Linux for Sparc for example will outperform Solaris on older Sparc computers. But they say they wouldn't make the same claim for the latest Ultrasparcs running finely tuned Solaris. They say that the main advantage Linux has is that it is much lighter weight than Solaris, but that can translate into a disadvantage for higher end applications.

❖

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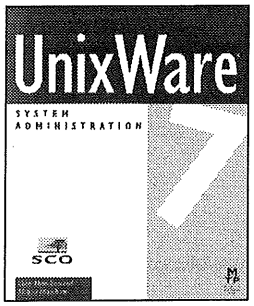

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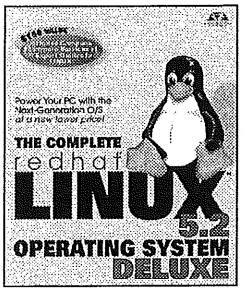

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CITY	LOCATION	OTHER
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CANBERRA	Australian National University	
HOBART	University of Tasmania	
MELBOURNE	Various. For updated information See: http://www.vic.auug.org.au/auug vic/av_meetings.html	The 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 1-800-625-655.

Unix Traps and Tricks

Jerry Vochteloo
jerry@socs.uts.edu.au

Welcome to the May issue of Unix traps and tricks. My name is Jerry Vochteloo and I am a lecturer at the University of Technology, Sydney. I teach operating system and network based subjects and am currently waiting on one more examiner to return his report for my PhD thesis. I will be your friendly UT&T sub-editor.

When I was putting the column together, I was surprised that the cupboard was a little bare of contributions. Surprised, as I am sure that we all have something to contribute to this column.

I am planning to run this column with different themes each issue Ideas for possible themes which came to me were: X-windows, security scripts/tricks/traps, window managers, logon scripts. These are of course only examples.

Any contributions can be sent to me at jerry@socs.uts.edu.au

I look forward to a fruitful time as the editor of Traps and Tricks.

REALDATE RE-VISITED

Graham Jenkins
Graham.K.Jenkins@corpmail.telstra.com.au

A couple of days after the February issue of AUUGN hit the streets, the 'realdate.pl', which appeared therein, fell over. The reason was that one of the NTP servers it was addressing didn't respond. So it just hung - and the backup program which was calling it also hung.

It was about that time I acquired a copy of "Perl Cookbook" from O'Reilly and Associates. Using an example therein, I was able to modify 'realdate.pl' so that it would time-out sensibly in a situation such as that outlined above. The new version is as follows:

```
#!/usr/local/bin/perl -w
# realdate.pl Returns 'real' date as found on NTP server(s).
#             If called with parameter '-s', returns date in form 'yyyymmdd'
#             Graham Jenkins, IBM GSA, January 1999. Last revised: 990318.
require 5.002;
use strict;
use IO::Socket;
my ($conf, $type, $remote, $s, $flag, @field, %month ) ;

foreach $conf ('/etc/ntp.conf', '/etc/inet/ntp.conf') {
  open(CONF, $conf) or next;
  while (<CONF>) {
    chop;
    ($type, $remote) = split or $type='x' ;
    if ( $type eq "server" ) {
      $s = IO::Socket::INET->new(PeerAddr => $remote,
                                 PeerPort => 13,
                                 Type     => SOCK_STREAM,
                                 Timeout  => 5 ) or next;
      $flag = shift || "x";
      if ( $flag eq "-s" ) {
        %month = ( "Jan", 1, "Feb", 2, "Mar", 3, "Apr", 4, "May", 5, "Jun", 6,
                   "Jul", 7, "Aug", 8, "Sep", 9, "Oct", 10,"Nov",11,
                 "Dec",12 );
        while (<$s>) {
          chop;
          @field = split;
          printf "%04d%02d%02d\n", $field[$#field],
                                $month{$field[1]},$field[2];
          exit;
        }
      }
      else { print $_ while defined($_ = <$s>); exit; }
```

```
    }
  }
}
```

Shortly thereafter, another problem came to light. Whoever administers the corporate NTP servers decided that they should no longer answer ('daytime') requests on port 13. Oops!

It was then that I started searching the Web for a quick solution. I discovered a program called MSNTP (don't ask what the 'M' stands for; the rest is for 'Simple Network Time Protocol') which is able to query conventional NTP servers on port 123 and return an easily-read local time. Just what the doctor ordered! In fact, it can also reset or adjust the time on the local machine when executed with root privileges, or function as a server, supplying time information to client machines.

So everything is working again. For those of you who are interested, MSNTP can be found at: ftp://oozelum.csi.cam.ac.uk/bin/msntp-1.5.tar.gz

And those of you who are truly dedicated may even want to replicate its unprivileged client mode functionality in Perl. Enjoy!

❖

TABS_TO_SPACE

Andrew Weston
andreww@adacel.com.au

You may well have seen/used something like this before, or there might even be a UNIX command I don't know about.

Basically when you pass a text file through the script it will replace <tab> characters with the appropriate number of spaces to position the next character on a tab stop. It works for 4 spaces = 1 tab but readers could adapt it.

For want of a better name, I called the script "tabs_to_space".

It is invoked like any other piped program (e.g. `cat <file> | tabs_to_space | lp`).

```
/usr/bin/awk '{
    counter = 1; space_ctr = 1;
    curr_char = " ";
    for (counter = 1; counter <= length($0); counter++) {
        curr_char = substr($0,counter,1);
        if (curr_char == "\t") {
            space_to_tab = ((space_ctr - 1) % 4);
            if ((space_to_tab == 0) || (space_ctr == 1)) {
                printf(" ");
                space_ctr = space_ctr + 4;
            } else {
                num_spaces = (4 - space_to_tab);
                for (ctr2 = 1 ; ctr2 <= num_spaces; ctr2++) {
                    printf(" ");
                    space_ctr++;
                }
            }
        } else {
            printf("%s",curr_char);
            space_ctr++;
        }
    }
    printf("\n");
}'
```

❖

ACLWEB

Jerry Vochteloo
jerry@socs.uts.edu.au

I lecture at UTS. UTS is very big on on-line support for subjects. As such I have all my lecture, assignment and tutorial information on the web. One thing that constantly annoyed me was the fact that I had to have two copies of each tutorial (one for the students, sans answers; and one for the tutors with answers). Each time I updated (or corrected) a question I had to update multiple copies of the file. What I wanted was to be able to selectively serve bits of a html file depending on the identity of the requestor.

After giving up on server side includes I decided on perl and cgi. It works in the following way. A user has to have a valid account to be able to access the files. This is authenticated using a suitably configured .htaccess file. The authenticated user id (in the environment variable REMOTE_USER) is what I use for access control (but you could use IP address etc). The below cgi script will serve files from a hidden (or inaccesible) directory (in $hiddendir). It will provide parts of the html file depending on a set of tags.

The mapping between target tags is done in the authfile which has a list of

```
tag <user>*|all.
```

my file has the following contents:

```
tutors col sen voh jerry
solutions col sen voh jerry
students all
```

This indicates that `col`, `sen`, `voh` and `jerry` are all in the access group tutors and solutions and the everybody is a member of the group students.

All I have to do now is enclose the solutions in

```
<!-- begin solutions -->
<!-- end solutions -->
```

pairs and voilà, the students don't have access to the solutions but the tutors do.

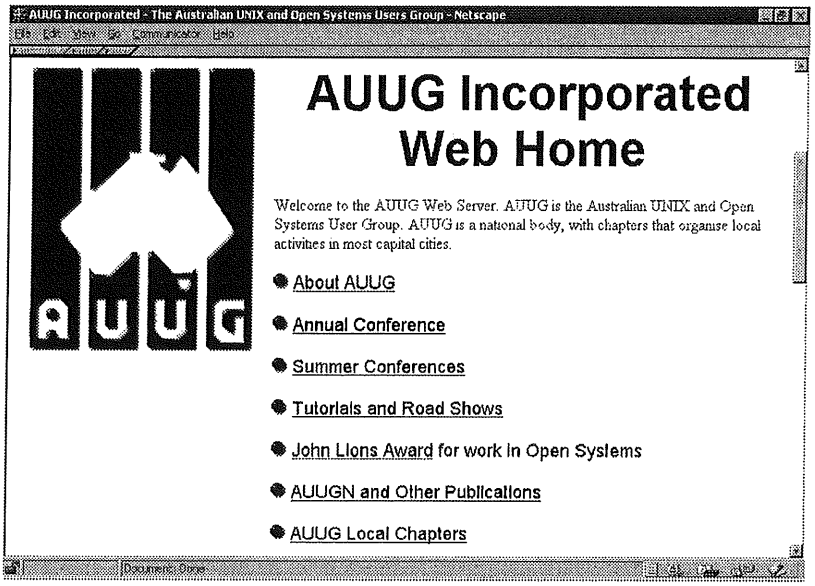
I suspect this code might contain one or two loopholes, but it seems to work if you don't push it too hard. I further apologise for my lack of perl finesse, I'm only a recent convert :)

```
#!/usr/local/bin/perl
#
#
#  Jerry Vochteloo 1999
#  aclweb.cgi
#
#  This script will extract parts of a HTML file
#  according to who is looking at it.
#
#  This will print the html file and the text between
#  <!-- begin target -->
#  <!-- end target -->
#  pairs.
#
#  Usage:    url/cgi-bin/aclweb.cgi?filename.html
#
#  Bugs
#    No nesting of target tags
#    The conditional tags must be on a seperate line, by themselves
#    (brain dead tag matching on my part)
#
#
# Implementation:
#    Simple state machine, print the stuff between valid tags
#

print "Content-type: text/html\n";
print "Pragma: \"no-cache\"\n";
print "\n";
```

```
$filename = $ENV{'QUERY_STRING'};
$filename =~ s/\.\.//g;       # get rid of those silly ../../ tricksters
$public = 1;
$print = 1;
$hiddendir="somehiddendir/";
$configfile="authfile";

if (! $filename) {
    print <<EOF;
<title>Error</title>
I could not find a file
EOF

    exit 0;
}

$user = $ENV{'REMOTE_USER'};  # this is set by an authenticate in .htaccess
                              # I authenticate by this

%targets = ();

open(AUTHFILE,"$hiddendir$configfile") || print "blah"; # open authfile
while (<AUTHFILE>) {
    @users = ();
    ($alias,$users) = split(/ /,$_,2);
    $_ = $users;
    if (/$user/ || /all/) {
       $targets{$alias} = 1;
    }
}
    open(FILE, "$hiddendir$filename") || exit 0;  # open requested file
    while(<FILE>)
    {

    if ($public == 1) {
       if (/^\<\!\-\- begin (\w+) \-\-\>$/i) { # this line needs a little work
           $public = 0;
           $curr = $1;
           if ($targets{$curr} != 1) {
              $print = 0;                  # the target is not in the list
           }
           next;                             # don't print the tag
       }
    } else {
       if (/^\<\!-- end (\w+) --\>$/) {
           if ($curr == $1){
              $public = 1;
              $print = 1;
           }
           next;                # don't print the tag
       }

    }

    if ($print == 1) {           # if printing is on, print :)
      print $_;
    }

}
```

Well that was all for this issue. Keep on hacking and see you next issue, remember that you too can have your 15 minutes of fame by contributing to UT&T.

❖



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Expiry Date _____

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) 9332-4066

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#: _____