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# LINUX

## FORMAT

THE UK'S BEST-SELLING LINUX MAGAZINE!

# 50

**th ISSUE**

- 10 LINUX BIGGEST HITTERS
- 50 HOTTEST PICKS + 105 ON THE CDS
- 26 PAGES OF TUTORIALS
- 11 NEW LINUX PRODUCTS ON TEST

## EXTREME PROGRAMMING

The holy grail of coding paradigms or just hot air? The experts fight it out **p52**

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## FORTAN FOREVER!

Do not despise the snake for having no horns – FORTRAN may be old, but it still has many uses in the modern world **p56**

*"A key figure in the formation of the LSB and OSI, he often pops onto Slashdot to join in the discussion", Discover the Linux who's who **p46***

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# Fifty sense

**Y**es, it really is our fiftieth issue. To me it seems like not so long ago that I sat down at an otherwise empty desk with a blank sheet of paper and tried to sketch out an idea of what a magazine for the Linux community might look like. If we were starting again, we probably would have done things slightly differently.... Looking back, it's amazing to see what has changed in the interim – not just in terms of the magazine, but the whole Linux community. In those days, we were talking about Corel's bold move into the Linux market with the possibility of some real office software and productivity applications, as well as their own distro. Back then, much was made of the fact that some banks were considering using Linux for web servers, and Caldera (now known better-known as SCO) was a force for good, being one of the best and most respected distro vendors of the day!

Linux has come a very long way since then, both technically and in terms of image, and in many ways the magazine has also changed to

mirror this shift, in both the subjects covered and the way in which we deal with them.

At this point though, I don't want to be self-congratulatory at all. Though the magazine and the Linux movement as a whole has lasted longer than many people predicted, there is still *a lot* of work to be done. More and more, the emphasis on Linux is turning to useability, both in terms of software behaviour/interface design, and documentation. In terms of *Linux Format*, I still believe we can deliver a better magazine – an easier-to-use system for installing coverdisc software for instance, or tutorials that cram in even more ancillary information without becoming bogglingly complex, or simply by thinking up more inventive ways to convey information to you.

We'll try harder in the next fifty issues, we promise you, but do keep your ideas coming – we can't create this magazine without you. A very big thank you for reading so far – I hope you'll still be enjoying *LXF* when we get to issue 100!

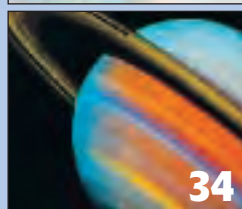


**Nick Veitch** EDITOR

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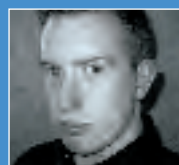
**Linux Format is a magazine dedicated to Linux and the Open Source community. We aim:**

- To provide the most accurate, unbiased and up to date information on all things Linux.
- To promote the use of Linux in business and the home, for servers and on the desktop.
- To support the Open Source community by providing a resource of information, and a forum for debate.
- To help all readers get more from their Linux experience by providing insightful and useful tutorials.

## MEET LINUX FORMAT'S TEAM OF WRITERS...



**Andrew Channelle**  
The Linux beginners' best friend, Andy also scribbled off the news on the day that kernel 2.6 was released...



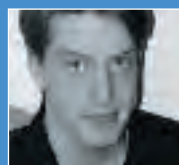
**David Coulson**  
Our Answers guy is a networking and security guru with plenty of sysadmin experience.



**Mike Saunders**  
The Hot Picks host has had his work cut out this issue compiling the Hottest Picks in the world ever...



**Jono Bacon**  
Jono is a core KDE developer, web developer and writer. Jono is also a musician and sound engineer.



**Paul Hudson**  
Took a break from reviewing and writing tutorials to wish a Happy Valentine's Day to his legions of concubines.

**Marco Fioretti**  
May be in the gutter, but he's gazing at the stars in this month's Roundup of astronomic applications.

**Hoyt Duff**  
Fishing pier proprietor Hoyt spends his spare time installing Linux on anything that stays still long enough.

**David Cartwright**  
Veteran journalist and Linux consultant, he knows his stuff when it comes to real-world Linux usage.

**Michael J Hammel**  
Professional GIMP artist who pens (or pencils) our current Open Source graphics tour-de-force.

**Biagio Lucini**  
This Italian brushes up on his computing history to let us know why Fortran is still in use today.

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More contact info on p114



LXF50 February 2004

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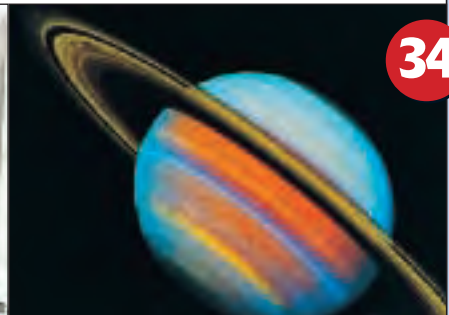
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**50 HOTTEST PICKS** The very best Free/Open Source software from LXF's first 50 issues including: **Firebird/Thunderbird** Mozilla's top-notch browser and mail client; **Planner** sort all your projects out; **Scribus** impressive DTP power; **Anjuta** coders' development suite; **Exim** alternative to Sendmail MTA; **ProFTPD** transfer your files in style; **ZNES** Fabulous Nintendo emulator; **BZFlag** Tanks a million!



## DVD

**EVERY SINGLE HOT PICK EVER!** Try out ALL the latest versions of **over 230** Free/Open Source programs that have featured in the magazine over the last forty-nine issues!

Please read the coverdisc instructions on page 110 before installing from coverdiscs!



## SAVE MONEY!

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See page 96 or phone 0870 4448645



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## THE YEAR AHEAD

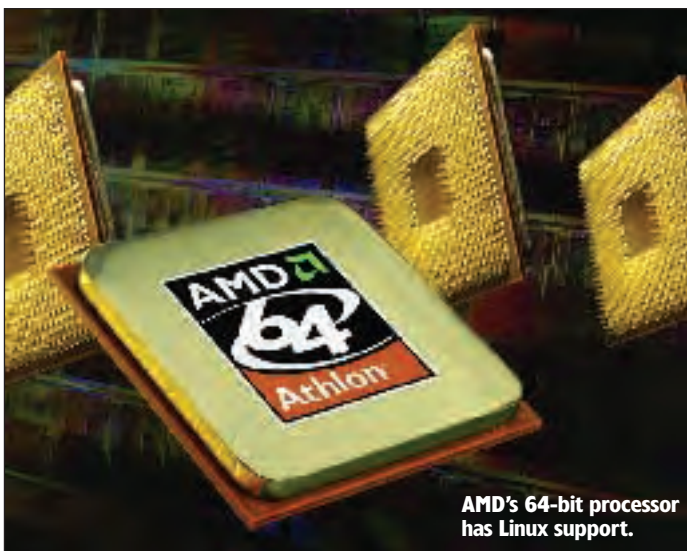
# 2004: The year of mainstream Linux?

As each New Year's house party draws to a close, Linux users huddled in the kitchen next to the fridge traditionally rejoice in the fact that "This year our favourite Open Source operating system will be hitting the mainstream". In fact, every year for the last half-decade has been declared 'the year of Linux', and while it could be confidently argued that it now runs most of the Internet, mentioning the word 'Linux' to the man on the Clapham omnibus will still elicit a blank stare (unless they're in the haulage industry, where *Linex* is a well-known spray-on truckbed protection?) However, common consent among a wide range of industry watchers suggests that the OS reached 'tipping point' in 2003 and is set to hit the big time this year.

But what are the factors inspiring such blind – if consistent – optimism?

### Desktop gains

The last quarter has seen linux advocates Sun Microsystems striking deals with entities such as the Chinese Government, South America education ministries, Australian Telecoms giants (see *LXF News* past five issues for these stories) and now the UK's National Health Service (NHS) is to test and, in most cases, build migration strategies around the combined forces of the company's Java Desktop System and *Star Office 7*.



AMD's 64-bit processor has Linux support.

NHS IT Director Richard Granger said the organisation would trial Linux with a view to rolling it out over 800,000 desktops, an enormous task that could, he said, generate savings of "millions of pounds" in software licence costs. Granger's flirtation with Sun could, say some pundits, merely be brinksmanship in the face of 'unproductive' negotiations with Microsoft over Windows licence costs. However, it is also possible that the deal is more than fluff as the NHS recently awarded a £1.5 billion systems integration contract to BT subsidiary Syntegra, a major Sun partner.

A further 500,000 desktops appear to be up for grabs in the UK's Office of

Government Commerce (OGC) trials of Sun's desktop. Only recently the OGC announced a trial with IBM involving Open Source software on the server-side, but buyers were said to be "unenthusiastic" about desktop options. Until, that is Sun CEO Scott McNealy met with OGC CEO Peter Gershon to extol the benefits of Linux.

The Register's John Lettice ([www.theregister.co.uk](http://www.theregister.co.uk)) says the deal, should it happen, may have profound effects on the computer industry as a whole. "Not having Microsoft on the desktop would substantially reduce the chances of the company leveraging its way further into the server side, and would require that

any Microsoft systems used would interoperate effectively with Open Source desktops."

It also goes without saying that 1.3 million users exposed to Linux in the workplace would translate to a much higher profile in the High Street.

### Kernel 2.6

The latest kernel iteration was released on Thursday 18th December 2003: going straight from Test 11 to final, with considerable numbers of changes. It is designed to push the OS further into the enterprise and data centre operations that usually rely on industrial-strength Unix. With the – legitimate – improvements in scalability (both up and down), a greater commitment from the world's biggest hardware and supercomputer builders and an increasingly consolidated group of vendors selling and supporting Linux for big iron, it is unsurprising that the majority of the world's top companies are looking at, or have already implemented, Linux systems. And this is without mentioning the out of the box support for a number of 64-bit processors that will become more widespread this year.

### SCO versus IBM

Ironically, the action, which SCO appeared to hope would kill Linux and benefit SCO UNIXWare, has had the opposite effect, raising the profile of the OS especially among corporate buyers. A recent study suggested that over 80



## YOUR VOICE!

Visit the *Linux Format* website at [www.linuxformat.co.uk](http://www.linuxformat.co.uk) and let us know your thoughts on the coming months and years ahead on our forums. Remember, wild predictions may come back to haunt you...

per cent of CTOs from Fortune 500 companies questioned hadn't altered their Linux plans in the face of the lawsuit. This, of course, still means that 20 per cent of them have rethought or frozen their implementation plans.

## Novell and SUSE

The long-term benefits are still to be speculated, but for those who feared Red Hat may evolve into 'the new Microsoft' have received a boost, as SUSE will gain a large marketing arm in the USA. One group with a potential problem is KDE developers and fans who, with the amazing work done throughout 2003, may see valuable development dollars siphoned off to Novell's Ximian/GNOME effort. SUSE says this won't happen and that user choice is still a fundamental tenet of the distribution.



**Scott McNealy** has been all over the world pushing Sun's Linux desktop.



The SchoolTool project already benefits from Shuttleworth bounties.

## OPEN SOURCE NEWS

## More bounties for FOSS developers

In the footsteps of the recently announced GNOME Foundation bounties, South African billionaire (and space tourist) Mark Shuttleworth has personally set aside US\$100,000 to fund Open Source development in a number of areas.

Shuttleworth is a self-confessed Python junkie, so it's no surprise that much of the work he is keen to fund is based around the scripting language, especially with regards to integration into other projects such as *OpenOffice.org*, *The GIMP*, *AbiWord* and *Blender*. "I'd really like to see the development of common document object model standards and terminology across *OpenOffice.org*, *Abiword*, *Gnumeric*, *Agnubis*, *Sodipodi* and other GNOME applications." This,

Shuttleworth says, would accelerate the learning-curve of someone already experienced in scripting one application in Python, when they try to learn to script another.

The Shuttleworth Foundation has already shelled out 37,200 Euros on the SchoolTool project which has set out to create a free, Open Source Python-based school administration system which will be equally at home in 'first' and 'third' world schools. Bounties of up to \$3,000 are available for advancements in the SchoolTool project.

Interested developers should contact Thomas Black ([thomas@shuttleworthfoundation.org](mailto:thomas@shuttleworthfoundation.org)) in the first instance with proposals. [www.markshuttleworth.com/bounty.html](http://www.markshuttleworth.com/bounty.html)

## BEAGLE 2

## Linux in Space!

## The British Mars lander project

Beagle 2, which landed (we hope) on the red planet on Christmas Day, is to be controlled from a Linux workstation. The Lander Operations Command Centre, based at the new National Space Centre in Leicester, houses the 'high-spec' Linux PC (and two backups) used to send instructions to the Beagle 2 Lander and collate data for image analysis back on terra firma. As we go to press, Beagle 2 is about to separate from its parent craft, Mars Express, before making its final descent. The Lander Operations



Command Centre is unique in the fact that the general public can visit the centre and watch the scientists at work, so it may be worth a visit once the data begins flowing in.

All Rights Reserved Beagle 2: [www.beagle2.com](http://www.beagle2.com)

## Jono Bacon

The founder of UK Linux, KDE developer and all-round nice guy, Jono is also a musician who's tunes have been featured on Slashdot.



## COMMENT

## Community Internet

“Blogs are a big thing these days: lots of people online sharing their thoughts and experiences in their online diaries, and although this can often provide interesting (or incredibly dull), does it really constitute a valuable resource?”

Recently a lot of search engines and online services are providing a means to search and catalog blog entries. To me this sounds a strange concept due to the sheer pointlessness of searching via other people's experiences. Yes, if Bob Smith from Outer Mongolia has a dose of Bolivian Chicken Cough, you can search to see if anyone else has it, but does it really provide a useful resource?

One area where I do think this resource is interesting is the concept of a human-centric Internet. This resource will catalog people's thoughts and comments in their own words and description, and this may offer a purer view of the world and how we live it. Although this type of information could not be considered the most integral (due to the opinionated nature of the content), it could offer an interesting read.

The big question is whether it will catch on. I don't read many blogs myself, but of the few that I do read, I find them interesting. This concept is playing particular importance in the life of software developers, and this could also create a better insight into how our software is developed. This is certainly something to keep an eye on, and who knows,

I could be reading about your cat and its strange eating habits any day now. I am sure this is not what the Internet was intended for, though...”

## PORTABLE DISTRO

# Take Mandrake on the road with MandrakeMove

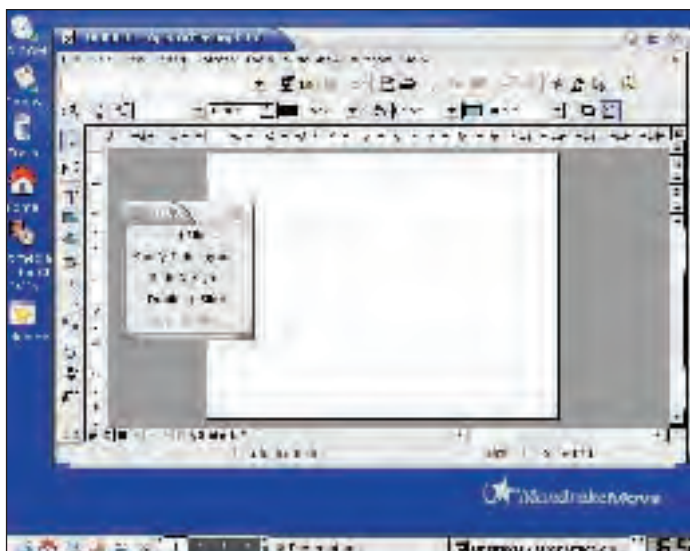
**M**andrakeSoft, now Europe's biggest Linux company, has launched a new version of its distribution aimed at users who want to take their data on the road without the expense of a laptop. MandrakeMove combines a non-install, CD version of Mandrake 9.2 and either a 128MB or 256MB USB key with which to store all your personal data.

Following the tradition established by the highly regarded Knoppix project, MandrakeMove can be carried around on a single CD and run on any PC without the need to partition, install or otherwise change the system configuration. Uniquely, once loaded, the MandrakeMove CD can be ejected, so access to data on other CDs doesn't rely on the machine sharing a

pair of drives. Moreover, the USB key solution also offers robust encryption methods to ensure your precious data doesn't fall into the hands of strangers should you lose your oh-so-portable miniature USB drive down the back of someone's sofa.

Applications include a selection of web browsers, email client, *OpenOffice.org* and the ever-useful *Frozen Bubble* game. The disc also has extensive localisation features.

The package is available at an introductory price of 69 Euros (128MB) or 129 Euros (256MB) initially from [www.mandrakestore.com](http://www.mandrakestore.com). A download version (obviously sans USB device and, initially, without the key feature) is available from the usual Mandrake mirrors ([www.mandrake.linux.com/en/ftp.php3](http://www.mandrake.linux.com/en/ftp.php3)).



Inclusion of *OpenOffice.org* makes doc creation on the move easy, and MandrakeMove's portability can be used to wow people into migrating...

## Linux Web Watch/



Good for news.



Visit the active forums.



It's plain but does the job.



Mandrake users go here!

## Linux and peripherals

Hardware is getting easier to support every day...

It has long been a bugbear that you can go out to PC World and pick up some hardware, but when you get it home there is no guarantee that it will work with your Linux box. Fortunately, an awful lot of people have previously tried an awful lot of kit and reported their findings back to the world at large. Unfortunately, they've not all done it on the same website. So here are a few good ones...

Linux Hardware, on the Net at [www.linuxhardware.net](http://www.linuxhardware.net) is stuffed with over 1000 submissions from users and the excellent searchable 'Driverbase' which should be your first stop if your distro vendor (see below) doesn't come up with the goods.

Another site called Linux Hardware ([www.linuxhardware.org](http://www.linuxhardware.org)) has some good user provided information based around the site's forums. These cover

everything from motherboards and CPUs to video cards and case mods.

The Linux Documentation Project has a nice section devoted to hardware issues at [www.tldp.org/HOWTO/Hardware-HOWTO/](http://www.tldp.org/HOWTO/Hardware-HOWTO/). This is also regarded as the hardware home for Debian users. It is typically plain and simple, has quite a lot of useful information but is really in need of more recent updates.

Of course the main distribution vendors also have their own databases of tested hardware, though you must remember (as the sites are at pains to point out) that inclusion on these lists does not offer any guarantee that stuff will work. You can find them at: [www.linux-mandrake.com/en/hardware.php3](http://www.linux-mandrake.com/en/hardware.php3), <http://hardware.redhat.com/hcl/>, <http://hardwaredb.suse.de>



## NEWSBYTES



■ The raytracing facilities from Blender's predecessor **Trace** have been back-ported to the recently Open Sourced 3D modeller creating what project leaders have called an "almost useable" raytracing option. [www.blender.org](http://www.blender.org)

■ **Hewlett Packard** has achieved the highest volume of server sales for the sixth quarter in a row. It achieved the number one position in Linux, Unix and x86 sales, taking 30.6 per cent of the market overall according to latest figures from IDG.

■ **Cyberguard** has completed its acquisition of SnapGear, a Linux-based security systems provider. President Pat Claw said the deal would enable Cyberguard to expand into the growing virtual private network (VPN) and firewall market.

■ Michael Roberts's battle for the **Lindows** name has taken on a European dimension as judges in Finland and Sweden granted injunctions against his product. Roberts began a European tour after Microsoft began (allegedly) threatening Lindows resellers in Holland to stop selling the distribution which, it claims, trades on its similarity to the Windows name, or face legal action. Roberts continues to argue that windows was in use before Microsoft acquired its trademark in 1983. Recently a US court ruled in favour of Roberts, but the Euro-judges have not so far concurred.

■ **Israel's** Department of Commerce is expected to begin imminent trials of localised Mandrake desktop software, as the departments support contract with Microsoft comes to an end. Most workers within the department will begin the process of migration from Windows/MS Office to an *Open Office.org*-based solution – which now supports right-to-left-languages such as Hebrew and Arabic – over the next few months.

## BIG IRON

## Red Hat Enterprise Linux on eServer



The iSeries, part of the eServer line, is now certified for use with Red Hat Enterprise Linux 3.

Despite speculation that IBM was getting uncomfortably close to Novell/SUSE, the company has announced full support for Red Hat's Enterprise Linux 3 on eServer hardware. Enhancements in the upgraded software enable Linux to scale to 32 processors instead of eight and address 64GB of memory, up from 24GB.

The deal is an expansion of the multi-year agreement signed between Red Hat and IBM in 2002, and Red Hat has similar deals in place with three other major hardware builders – Hewlett Packard, Fujitsu and Dell – putting them, a spokesman said, in the perfect position to exploit the improved profile of Linux in corporate IT circles.

The eSeries product line includes everything from iSeries and pSeries boxes to POWER-based BladeCenter devices and clusters. The deal also includes support for IntelliStation and TotalStorage products.

IBM said that its Global Services Network would continue to provide 'end-to-end' support across both hardware and software including the likes of *WebSphere*, *DB2*, *Lotus*, *Tivoli* and *Rational*.

Scott Handy, IBM's Linux strategist, said that the alliance would help spread the advantages of Linux to

## RED HAT EL3 GETS LSB CERTIFIED

Red Hat is claiming the broadest ever compliance with the Linux Standards Base (LSB) with its new Enterprise Linux 3 product line. The company is touting EL3 as the first enterprise-level distribution to be certified across all LSB runtime environments, including IBM's eServer line. Daniel Quinlan, Chairman of the Free Standards Group – which administers the LSB – said that Red Hat's achievement was an indicator of the swift advance Linux had made in the enterprise sector. "LSB certification is critical to companies and their customers to ensure compatibility across an enterprise infrastructure."

Red Hat has also been pushing to have EL3 certified under the Common Criteria scheme which is the worldwide benchmark for security in IT systems. CC certification is often a requirement for software use by national governments. The program is being undertaken by the government's Communications-Electronics Security Group on Dell and HP hardware.

business users across the world. "The two companies create a compelling value proposition, combining forces to enable a business to deploy a resilient infrastructure throughout the enterprise built on Linux."

## Hoyt Duff

The co-author of *Red Hat Linux 9 Unleashed* runs a fishing pier when he's not shouting lovingly at his computers.



## COMMENT

## A man on a mission

“Barry Smith is a man on a mission. He is completely self-taught at Linux, has supported the community both financially and by writing documentation for his LUG; he participates in a community-based documentation editing project. In mid-November, he posted a brief editorial about the sordid state of Linux documentation on the OSNews website and wants documentation to be what it should be: clear, concise, correct and accessible. The reactions were lamentably predictable: “Users don't read documentation”, “Good apps don't need documentation”, “Windows documentation isn't good either”, “What have you done for Linux?” “You're a judgmental a\*\*”, “Do it yourself”, “Troll”, “My distro has great docs, yours doesn't”, “RTFM!”

How sad for our community.

Actually, there *is* some good documentation and the Linux Documentation Project has made great headway, as have some projects, but we *must* do more.

The responsibility for writing the documentation rests squarely on the shoulders of the person writing the code. Good technical writing is a skill in itself and few coders seem to possess it; they should recruit and collaborate with a writer. A Wiki-type page to allow community participation in the documentation is a good idea. The current paradigm of manpage/info/HOWTO/RTFM is not working as well as it should.

Let's talk as a community about getting documentation fixed, but the unconstructive idiots who made the useless and trite comments to Barry's post need to get on board or get out of the way.



## DISTRO NEWS

# Xandros 2 refines the desktop experience

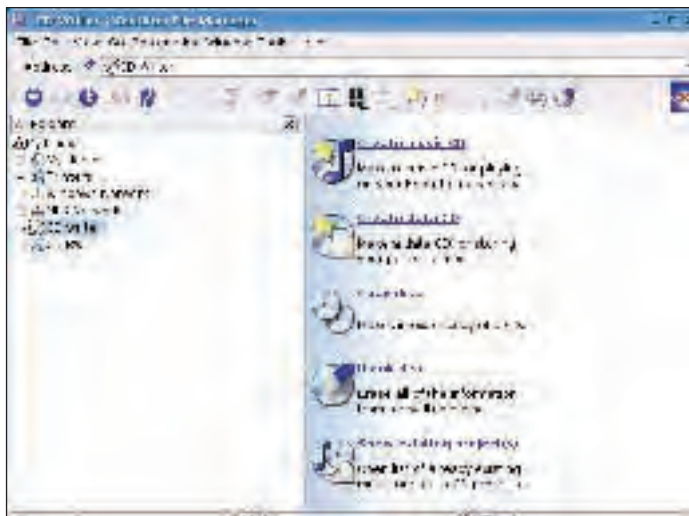
**X**andros continues its phoenix-like rise from the ashes of Corel Linux with the second major version of its Linux distribution. Built on Debian (Sarge) and kernel 2.4.22, Xandros 2 improves installation – now a four-click process – and integration with Windows networks and dual-boot (even NTFS) systems. It also boasts the ability to burn CDs directly from within the file manager and, in the Deluxe version, compatibility with a range of Windows applications via CodeWeavers *CrossOver Office 2.1*.

Erwin Zijleman, author of Corel Linux for Dummies, said it was no longer fair to compare Xandros with Windows in terms of ease of installation, use and

desktop elegance. "Windows installation is easy, but installation of Xandros is even easier and a lot faster." Zijleman added that it's now possible to go from an empty system to "a fast and stable multi-user operating system" in less than 15 minutes, simply by answering a few questions.

Also included in the deluxe version is *CrossOver Plugin* which lets Linux users access web content designed for typically unsupported technologies such as Quicktime and Windows Media, and a 350-page printed manual. The deluxe edition costs US\$89, while the standard version costs US\$39. For a limited time, users of previous versions can upgrade at a discount price.

[www.xandros.com](http://www.xandros.com)



Burning CDs directly from the file manager is just one of the attractions.



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## NEWSBYTES



■ The ranks of Linux-based set-top boxes have been swelled by the launch of 'the world's first high-definition digital media player. The **Roku HD1000** costs \$499 and does all the multimedia stuff, but can also take advantage of the visual fidelity of the latest HDTVs. The company sells a range of high-definition art packs, which contain a selection of still and animated artistic works.

■ **Sun** will offer a combination of free and paid for support to Open Office users. A spokesman said that the reason the offer of support took so long to emerge was that the office suite has traditionally been used by individuals rather than businesses, but this situation was now changing, and demand was now widespread enough to make the endeavour cost-effective.

■ **Kernel** developer Marcelo Tosatti has said that he is keen to move users onto the 2.6 family as soon as possible. To speed this up he says that after the release of 2.4.24 he will only accept security and other critical additions, as the main development effort should go on the more up-to-date technology.

■ **The Linux Professional Institute (LPI)** has developed a new translation system which will allow the organisation's website to be access in a number of languages. The system alerts translators to changes made in other versions of the site so changes can be made to keep localised versions in sync. The t7e project is, naturally, Open Source.

■ **Novell** has become the latest member of the Open Source Development Labs (OSDL), current employer of both Linus Torvalds and Andrew Morton.

■ **Sourceforge** has launched a new payment system to allow application users to make donations directly to project developers.

■ A state of the art **Linux audio system** has been used to resurrect the 80-year-old Aeolian-Skinner organ that accompanied worship at the Trinity Episcopal Church at Broadway and Wall Street. The organ – called the finest church organ in the US by many aficionados – was destroyed by settling dust and debris that came from the collapse of the World Trade Centre on 11th September 2001.

## RED HAT SUPPORT

## Progeny to the rescue

**Red Hat users feeling left out in** the cold after the official end-of-life for the entire desktop range have been thrown a lifeline by Progeny, who will offer a number of support packages for Red Hat versions from 7.2 to 9.

'Progeny Transition Service' includes access to a software repository of security updates and timely notification of vulnerabilities. Packages are available

at a cost of \$5 per month, per machine or \$2,500 flat fee per month for an unlimited number of seats. Patches will also be available to users of Ximian's *Red Carpet Enterprise 2* service.

CEO Garth Dickey said "This update service will allow those businesses to transition to a new platform on their own timetable."

[www.progeny.com](http://www.progeny.com)

## SCO NEWS

■ **SCO** was hit by another alleged Distributed Denial of Service (DDoS) attack which the company claims was the action of person or persons unknown from the Linux community. Confusion surrounds the SYN flood, as protection against this sort of attack has been a standard feature of the Linux kernel for the past four years; a fact that has led to a number of prominent Linux advocates suggesting that SCO was attempting to elicit sympathy after a legal setback.

■ The setback may have stopped the entire case in its tracks by the time you read this, as a judge found in favour of IBM's motion to compel SCO to reveal the nature of their allegations of code theft within 30 days of the judgement. However, SCO has been granted one concession: that it can present its evidence in a closed court. So Linux advocates won't get to see it after all.

■ **Darl McBride** published another 'open letter' to the Open Source community in which he again claimed the GNU General Public License (GPL) was invalid as it conflicted with US copyright law on the basis that US copyright law provides options for the creator of a work to 'sell' their efforts, not to give them away.

■ The two organisations involved in the recent \$50 million investment (BayStar Capital and Royal Bank of Canada) have renegotiated the deal, apparently in order to exercise more control over who and who should not benefit from any settlement in SCO's favour.

■ **Pamela Jones** continues to have the latest and most in-depth information at [www.groklaw.net](http://www.groklaw.net). Groklaw also has a pretty good précis of contributions SCO staff made to the kernel under the watchful eye of senior managers.

## Embedded Linux News

■ **Samsung** has launched a new Linux-based smartphone in China. Like the new Sharp Zaurus, Samsung's SCH-i519 features Intel's PXA25 400MHz processor. It is available in English or Chinese, supports China's CDMA2000 network and includes PDA functions such as text editor, finance package, camera and music player. It is the first Linux phone to include Voice Signal's Voice Activated Phonebook (VAP) application, which allows users to launch applications using commands such as "Open Browser". VAP supports Mandarin Chinese and English, and also offers speaker-independent name dialling and text-to-speech output.



■ **Sharp** has expanded the Zaurus brand into the enterprise sector with the launch of its new SL-6000 PDA. The SL-6000 comes in three flavours and features the same portrait display and slide out mini keyboard as the consumer orientated SL-B500. However, the new models have a larger, clearer screen capable of 480 x 640 resolution; a 400MHz Intel PXA25 processor; 64MB Flash memory (of which 25MB is available to the user), and 64MB RAM. A combination of applications from OperaSoft, Hancom and Metrowerks completes the spec. The 6000N is the base model, with the 6000L adding WLAN support and the 6000W featuring both 802.11b and Bluetooth networking. LXF hopes to bring you a full review in a forthcoming issue!

## David Cartwright

An IT consultant since the phrase was respectable, David specialises in Linux systems and solutions.



## COMMENT

## Drivers to distraction

“ I've always been a bit wary of the commercial versions of Linux, because they're usually quite a way behind the current free versions, driver-wise. The reason is obvious: bleeding-edge systems are all very well, but if you're an IBM or an Oracle, the last thing you need when you're trying to write the Linux version of your industrial-strength application is for the kernel and the key system drivers to change once a fortnight! It therefore makes sense to have a stable operating base, even if it does restrict your hardware compatibility somewhat.

This led me to thinking about Linux on the desktop. I've just bought a new Dell laptop, onto which I duly installed Red Hat 9, and I had the usual faffing about for a couple of hours to make the Ethernet port, modem and video adaptor work by downloading, compiling and installing new drivers because the hardware was too new for even the newest RH.

The more I think about it, the more I believe that this is now, in fact, the greatest barrier to Linux becoming a corporate desktop OS. Corporations want the commercial version because that's what the apps are written for and it's what's supported by the vendor. Yet probably every new desktop or laptop PC you buy will bring a few hours mucking about searching for drivers, because nine times out of ten they won't be there with the Windows ones on the included CD.

So the Linux platform has come of age, desktop app support is there: the remaining barrier is getting desktop equipment vendors to ship Linux drivers just like they ship the Windows ones. That'll be fun to solve... ”



# Mailserver

Share your opinions, right wrongs and demand justice by writing to *Linux Format*. Drop us a line at: **Linux Format**, Future Publishing, 30 Monmouth Street, Bath BA1 2BW or email: [lxformat@futurenet.co.uk](mailto:lxformat@futurenet.co.uk)

## ★ Letter of the month

This month's winner receives a boxed copy of **Mandrake Linux Pro Suite 9.2**

### Penguin pensioner

I have just accidentally come across *LXF46* while browsing in a local convenience store. Although there are several journals devoted to Linux here in North America, I have never come across one that is both crammed full of useful info and worth the money! Although I am a retiree on fixed income, I have decided fork out for a yearly subscription as it works out at about 2/3 the newsstand price.

I am a relative newcomer to Linux as I am frantically trying to get myself away from Windows with all its irritating bugs and frequent crashes. It certainly riles me to have to PAY Bill Gates for him to fix HIS bugs! I am currently



running Mandrake 9.0 after a favourable experience with Mandrake 8.2 purchased from the 'remaindered' rack in a local computer store. There are many things to which I have to get used, including the apparent esoteric requirements associated with adding both new software and hardware. One matter puzzled me so much that I paid out \$240 for someone to come and 'fix' it - this was getting my ADSL link through Bell up and running. Regrettably, the assured 'whizz' Linux expert left after two hours without having

done the job - next day my random fiddling around as **root** located an ADSL connection wizard and I was on the Internet in under ten minutes!

I am now an enthusiastic convert and disciple of Linux spreading the good news as far as I can! **Croombe F. Pensom, Canada**  
Glad to see that your perseverance paid off in the end. As a small token of compensation, we've wangled a brand spanking new boxed set of Mandrake Linux Pro Suite 9.2 for you - thanks, Gael Duval - which will be in the post to you as you read this.

easily, but integrating them into Ooo in such a way that both sets of macros worked for the same document may be interesting. There have been a few abortive attempts to create a VB interpreter for Linux, but it would certainly be difficult to integrate such a beast into Ooo.

### Linux on film

For a number of years I have been involved in the production of corporate videos and have used various video-editing packages running on Microsoft OSes. They have all suffered from one common problem - crashes - which invariably result in you losing a lot of work unless you set autosave to (say) every three minutes, in which case it becomes a nuisance.

In the background I have always hoped there would come a time when a Linux video editing package would become available so we could work on a more stable platform. Having looked at *Broadcast 2000* (now *Cinelerra*), and *Main Actor*, they both appear to be getting nearer what is required, however neither of them have video capture built-in, and I have given up trying to install *NewVideoRecorder* on my MDK 9.2 system due to dependency problems.

There seems to be a lack of understanding of how video editors work: capture (in fact batch capture) from tape is a most important part of the post-production process as is being able to export to tape a finished project (archiving to DV/DVCAM tape results in a high



**LXF44's DVD contains a fantastic selection of Linux multimedia applications for you to try.**

### Quick Draw

I found your articles on Office Apps in *LXF48* extremely comprehensive and I have already pointed our IT Manager at them; but I have a couple of points:

First, all your contributors are rather dismissive of the *Draw* package in *OpenOffice.org* on the grounds that compared to apps such as *Photoshop*, *Corel Draw*, etc it is pretty poor. I think that this misses the true purpose of *Draw*; a better comparison would be with *MS Visio*. Anyone who buys *MS Office*, (at least up to *Office 2000*, I have no knowledge of *Office XP*), is saddled with an extremely cranky drawing package that has no proper drawing support other than an electronic pencil. To get properly implemented tools such as *snap*, *glue*, *grid*, *connectors* etc which

make line drawings so much easier to do, the user has to shell out another £150 for *Visio*, then you get a load of stuff that the average user doesn't need.

I have used *OpenOffice.org* almost since first release for non-artistic drawings (I planned and laid out my garden wall for example) and I believe that it has all the tools needed and works better than *Visio*, which is overloaded with features.

My second point is the migration issue. My company uses *MS Office* extensively, (including *Visio*), to produce Proposals, Estimates, Specifications, circuit diagrams and many other things that a test engineering company typically does. Our IT Manager is very attracted to *OpenOffice.org*, but is put off by the compatibility issues. This isn't a problem of ignorance; this is

because our legacy docs use macros and VB scripts extensively. Porting these across at the moment would involve some extensive rewriting. What's needed to make the transition painless is import support for these elements of *MS Office*, or if this is not possible (or legal), some kind of a tool to make the conversion easier. This could parse each line of the macro or script and suggest the *OpenOffice.org* BASIC equivalents perhaps. With that kind of support, the obstacles would soon come down.

**Terry Coles, Dorset**

*OpenOffice.org* and *StarOffice* use their own macro language, which while not compatible with VB scripts, is not a million miles away as they are both based on the concept of an object oriented version of BASIC. It would be possible to recode fairly

quality master even if the project itself is destined for CD or DVD).

What the video production world needs is a video editing package that contains or includes capture/batch capture, is very easy to install, in other words doesn't result in hours of trying to find dependencies, and is an acceptable alternative to *Adobe Premiere* or even *Avid Express DV*. There are many editors I know who would be very interested in such a package and would happily set up a devoted Linux-based machine to run it on... Result: even greater spread of Linux. Incidentally most video editing systems are run on a devoted machine due to the editing package being intolerant of other software running at the same time.... So much for Microsoft's 'multitasking'! Anyone like to comment on this?

**Bob Savage, Gwynedd, Wales**

I quite agree, though some of the details you mention aren't entirely accurate. *Cinelerra* for example does have a capture facility which supports DV capture, though it is rather primitive in its current incarnation.

It's interesting you mention that editing systems are generally run on a devoted machine. One of the strengths of *Cinelerra* for example is that it can be used on a clustered rendering system to speed up generation of effects. It would be interesting to hear from anyone who had used this feature.

As usual though, the quality of the solutions and the speed at which they get developed are proportional to the amount of interest shown. I hope you share your feedback with the Heroine Virtual team as well as with us!

## SUBMISSION ADVICE

### WHAT WE WANT:

- Letters about the magazine or Linux in general
- Constructive criticism
- Your opinions
- Concise points about relevant subjects

### WHAT WE DON'T WANT:

- Technical question – direct those to our Q&A pages!
- Random abuse
- Nonsense rants
- 200 pages of meandering diatribe

### WRITE TO US AT:

**Linux Format, Future Publishing, 30 Monmouth Street, Bath BA1 2BW** or email: [lxf.letters@futurenet.co.uk](mailto:lxf.letters@futurenet.co.uk)

# READER TIPS

## PRELOADED PCS

In your last issue there were two letters asking where to buy laptops pre loaded with Linux. I bought a laptop and a workstation from Digital Networks ([www.dnuk.com](http://www.dnuk.com)) and I cannot recommend them highly enough. They primarily aim at business users, but that doesn't mean that as a one-off purchaser you will get any less of a service.

The guy who answered the phone on the sales line could talk about recompiling a kernel for the laptop (try that in Dixons!) The only time I had cause to contact support was almost a year after the workstation had gone out of warranty with a configuration question. I wasn't sure that I would get an answer but I did – and in very quick time.

The build-quality of both machines is excellent and I had the option to ask for the disk to be partitioned to my taste before it was loaded with Red Hat. Dual booting with Windows is an optional extra and it's really nice not to be paying for that licence if you don't need it. If you are in the market for a Linux machine, check them out.

**Tony Leake, via email**

## MKD 9.1 HANGS...

First, in *LXF44*, page 9, a reader described a black-screen hang upon installing Mandrake Linux 9.1, I believe. I had exactly the same problem, but the tips proffered in subsequent issues didn't match my experience (mind, I'm not debating or casting doubt on the advice given, it's helped me out countless times). When I install MDK 9.1 from CD, the initial menu appears, then after



Digital Networks sell PCs preloaded with Linux – send in the details of any other UK vendors you discover, and we'll print them!

pressing Enter and some activity, the system blackscreens and locks hard; the only choice at that point was to hit the reset button. After checking the media a little and checking/switching BIOS settings, something sparked in my memory (from where it came, I don't know). Instead of hitting Enter to begin installation, I hit F1 for more options and entered the string `linux mem=880M` at the command line... Bam! It worked! I also noted that MDK will install the 'enterprise' kernel, so my assessment (right or wrong) was that the install process couldn't handle my >1GB RAM, but somewhere deeper it correctly detected it and configured the system for "Enterprise" usage (which must have the 'bigmem' switch turned on). Just wanted to pass that along...

(My machine specs are: Athlon XP 2500, 1GB PC3200 Crucial RAM, nForce2 Ultra 400 chipset; in case that has a bearing on things.)

I've also recently paid for and installed *Libranet 2.8.1* and found it to be (personally) the smoothest Linux distro I've ever tried (after experimenting with RH 8/9, SuSE 8.2, MDK 8/9/9.1, Fedora Core 1). How about a review sometime?

In conclusion, I have to say that *Linux Format* is, hands down and unquestionably, the best Linux magazine out there. No other magazine comes close to the perfect mix of beginning and advanced material. My local bookstore charges ~\$15 per issue (CD included), and my wife (bless her heart) can't believe I'd pay that much for a single magazine... I just tell her she simply doesn't understand and plunk down the money. Any chance of moving the magazine to the USA? Probably not, but how about inviting US-based magazines for training? Not trying to start a little scuffle here, but all the 'local' magazines pale by comparison.

**Ron Eisele, Nashville, Tennessee, USA**

## Satisfied reader

I'm so thrilled. I wandered into the OwenShow section at Borland today, and discovered that someone had actually commented on *OwenShow* positively, and he saw it in your magazine! I quote his kind remarks: **James,**

*I strongly disagree with the*

*comments of the previous writer*

[my other fan, who didn't appreciate *OwenShow*!].

*Your program was featured in the British magazine Linux Format.*

*Following the instructions included in the package, the program worked first time. Your program is a very good effort and I at least*

*intend using it to scan directories on my computer.*

*Keep up the good work.*

*Regards, Sudhir Anand*

Heck, maybe a single response isn't much – but it's one more than I ever got before! *OwenShow* directory/file browser is available at <http://codecentral.borland.com/>





## MAILSERVER

◀ [codecentral.ccweb.exe/home](http://codecentral.ccweb.exe/home) amongst the Kylix offerings under my name ("James Owen") including Kylix/Delphi source. The web page [http://home.att.net/~owen\\_labs/ra nt7.htm#owenshow](http://home.att.net/~owen_labs/ra nt7.htm#owenshow) has some thoughts on the project. OwenShow's great talent is scanning whole directory trees at once. I feel like such a celebrity....

JG Owen, *via email*

Glad we could help, but keep up the effort or your 15 column centimetres of fame could be up!

## Linux Games

First of all, let me offer congratulations on producing an excellent magazine. I find that it's a good balance between tutorials, articles, reviews and readers letters. The DVD really is jam-packed with ready-to-go software.

However, even the keenest of Linux users must enjoy playing the odd game or two and personally, that's about the only reason I have a dual boot PC (XP/SUSE 8.2). As I'm sure your aware, commercial quality games software is a bit thin on the ground in the Linux world. How about putting some of the Linux-compatible game demos on the DVD? The new *Wolfenstein* game for instance, would give many people a boost and is practically

impossible to download on a dialup connection (it's about 250MB).

Also, as I work in Computer-aided Design, I am constantly rummaging around the web for Linux-compatible CAD/CAM software. Although I do this more for curiosity's sake than necessity, it's hard to believe that Linux has so little to offer compared to the Windows platform: there is nothing to compare with Solid Edge and Pro E etc. that seem to only be available on Windows.

Another suggestion for an article would be on getting ADSL up and running on Linux. I've always used dialup at home and cannot justify £28 per month for true broadband but nowadays some ISPs (Tiscali for one) are offering things like 150K connections for £16 per month. Do you know if it is possible to connect to Tiscali from a Linux box?

Mick Scully, *via email*

On the games front, the traditional story has been that there isn't a big enough market for the game producers to bother releasing Linux code. Ironically, as most of them use Linux as a development environment, it isn't often really a question of the porting effort required, but the expected cost of actual distribution, support, testing etc that puts them off.



You may recall that there was a crossword in the Happy LXF-mas section of LXF48. Here's the solution – hope it wasn't too hair-tearing for you!

One route is to include an 'unsupported' version of the game on the Windows CD, a route which has been taken by games such as *Wolfenstein* and *Unreal Tournament 2003*. The trouble with this from a Linux perspective is that the companies concerned have no idea whether people have purchased the game for Linux or Windows.

Sadly, short of petitioning the games companies themselves, there

seems to be little that can be done, apart from buying Linux games – eg the ones from Linux Game Publishing we have reviewed lately. Only when companies see a market opportunity will they make the effort...

## CAD on Linux

I have been using Linux for about a year, and have switched all home computing and much office computing to Linux. I am an

**Helpdex**  
shane\_collinge@yahoo.com



## MORE OR LESS DETAIL?

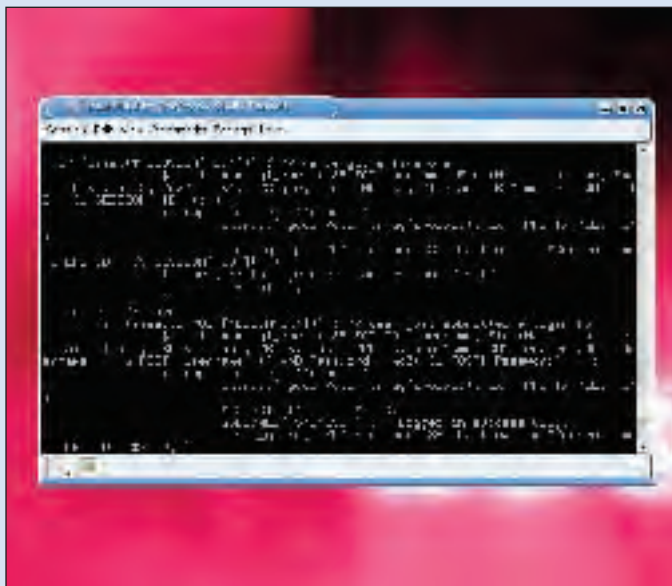
LXF's tricky balancing act

Firstly, congrats on a great mag. Secondly, a mild criticism; whilst sitting at work, thumbing through *LXF47*, in particular, the Mandrake 9.2 feature, I find myself thinking 'this is all well and good but what kernel version is included?' I'm sure there are people such as myself, who, whilst not wanting to install Mandrake, are still very interested to find out such technical details. I do find your reviews of distros helpful and informative but would prefer it if they were a bit more technical and drew more comparisons between software versions included in the major players. Lastly, I find it such an exciting time where we've gained control over our own property and publications like your mag can only help that cause. Long live *LXF*!

Andy Rock, *via email*

I have been reading *LXF* from issue 7 onwards and consider it a most worthwhile subscription. However, I find that because of the emphasis on detail the wider context is often lost. I wonder if the authors are so thoroughly versed in Unix that essential information for newcomers to Linux (not necessarily 'newbies') is left unsaid? I have often thought that there would be benefit in expanding the explanatory boxes into an article and condensing the article itself into 'box' form!

May I, therefore, put in a plea for context? It was quite enlightening to see in one article that, quite intentionally it would seem, "Unix [configuration?] files are always in plain text". As an example of how a wider approach



What would you have us do: explain some of this little lot for you, then leave you to draw some further conclusions yourself; or leave you to wade through it completely unaided?

could help, I have recently come to believe (but do not know) that `lilo.conf` is only referenced when the MBR and 'map' are prepared whereas, initially, I assumed that it would also be opened at each boot time. I cannot find a reference anywhere to this effect. Is it because 'everyone knows' what happens that the procedure is never described? I wonder how many readers actually know what takes place?

As a 'Linux-only' user I find it a little aggravating but understandable that explanations are often given with reference to 'Windows'. This is not just an *LXF* problem though, the first *GIMP* manual I read assumed a working knowledge of *Photoshop* (which I had never used) and now I find that to an extent KDE3 seems to

have been tarnished by the MS influence (I have stayed with KDE2 which I find more straightforward and intuitive). Surely it is possible to beat them without joining them!

Peter Antonelli, *via email*

Short of locking a representative bunch of readers in a small room and seeing who is the last one standing, maintaining a good balance in the magazine is a difficult proposition. However, the point about detail in distro reviews is duly noted – we used to print a boxout including version information on the major software included, and we will reinstitute that where space permits.

Where possible we do try to give information on the 'whys' and 'wheres' as well as the 'how' in tutorials and answers, but it can often be difficult to achieve without wandering entirely from the matter in hand.

engineer providing architectural and mechanical engineering consulting in New York City.

And here is my problem: there is no viable CAD program for the small office desktop on Linux. I am talking about a program like *AutoCAD*. I tried using *Varicad*, which looks promising but is not really for architectural work. *Arcad* looks good but may be overkill for us

(Certainly the price is.) There may be others that may be out there but I have not found them. Any advice? This is the only thing keeping us from going 100 per cent Linux!

Doug Lane, *via email*

There are a number of packages available for CAD on Linux. Most of them are either GPL or have demos so you can try them out. Among the best of those we can think of are:

**Qcad** – GPL and uses DXF as its native format.

**Varicad** – Commercial, but it does 3D CSG-Solids, reads/writes DWGs.

**Cycas** – Commercial, 3D, exports to povray for rendering.

Or what about running with *Wine*?

Join the list: [www.freelists.org/cgi-bin/webpage?webpage\\_id=cad-linux](http://www.freelists.org/cgi-bin/webpage?webpage_id=cad-linux)  
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# Reviews

All the latest software and hardware reviewed and rated by our experts

## LXF VERDICT EXPLAINED

Each review is accompanied by a Linux Format Verdict to help you to assess the product at a glance (it's no substitute for actually reading the review, though). We award scores out of ten in the following categories:

**Features:** Does it provide the functions you need? Is it innovative?

**Performance:** How well does it do its job? Is it fast and reliable?

**Ease-of-use:** Is the interface well designed? Is the documentation well written, helpful?

**Value for money/Documentation:** Whichever is most appropriate!

For those who like numbers, the *Linux Format* Rating is a score out of 10 summing up the overall excellence of a product. It will usually, but need not be, an average of the above categories. We award scores as follows:



**10** The close-to-perfect product.



**8-9** Good, but has a few niggles.



**6-7** Does the job, but needs work.



**4-5** Average.



**1-3** An utter disaster. Back to the drawing board.

## THE TOP STUFF AWARD

If we really, really like something – we really think that a particular piece of software, hardware or any other sort of ware is the best stuff around – then we'll give it our *Top Stuff* Award. Only the very best will be chosen. It's not guaranteed to all products that score highly.



## WHAT'S NEW...

### Evesham Reliance 500CW server >>

High Street retailer's first effort bravely enters the enterprise computing market **p18**

### Systemax Mission 6507 server

Paul Hudson nails his flag firmly to the mast in the great Itanium vs Opteron chip debate... **p20**

### Borland JBuilder X

Enterprise JDE – is the latest iteration a case of revolution or just evolution? **p22**

### CrossOver Office

Codeweavers' manipulation of the *Wine* project helps nervy newbies migrate from MS **p24**

### Seapine Surround

Version 2 of a GUI-driven alternative to CVS displays some joined-up thinking for managing groupwork **p26**



### Knights & Merchants

There's nothing better than having an army of minions to do your every bidding – if they obey you! **p28**

### Software Tycoon

If only all you needed to have a hit game was good packaging and marketing... *Wait a minute?!* **p29**

### Book reviews

*Linux Toys* by Christopher Negus and Chuck Wolber; *Linux Game Programming* by Mark Collins, et al; *Automated UNIX and Linux Administration* by Kirk Bauer; *Java 2 Game Programming* by Thomas Petchel **p31**

## LINUX FORMAT BENCHMARKS EXPLAINED

To provide objective performance comparison between machines running Linux, we run a set of in-house benchmarks. These are: *bonnie* and *hdparm* to test hard drive performance ('HD' in the benchmarks), a homebrew app to test how well a machine handles database serving ('MYSQL'), *ApacheBench* to test how fast a machine can serve web pages ('AB'), a *gcc* compilation of Linux kernel 2.4.19 ("COMPILE"), and *oggenc* to convert a test .wav file to a .ogg file. These numbers are then averaged to produce an overall score, which may be adjusted

slightly now and then, if a machine has a particular high or low point that should be taken in to consideration. Combined, these tests really push hard drives, network cards, and CPUs to their limits, and so give quite a representative figure – a multiple of the performance our yardstick machine.

The LXF yardstick box attempts to represent an 'average' reader's setup: Debian 3.0 on an 866MHz PIII with 256MB of RAM. So, a machine which scores 1.5 on our *Apache* test served 50 per cent more web pages than our yardstick, whereas a box that scores 3.0 for overall ran, on average, three times faster than our yardstick box.

### BENCHMARKS

HD	0.83
APACHE	1.22
MYSQL	1.11
COMPILE	0.96
OGGENC	1.71
OVERALL	1.17

The blue bar in the example above represents the performance figure for the hardware, and the red bar is the benchmark figure. When a piece of kit performs lower than the benchmark, as in 'HD' and 'COMPILE' above, the blue value will appear less than the red value. **LXF**

## BUDGET SERVER

# Evesham Reliance 500CW

Evesham is the cream of High Street desktop PC retailers, but what can it do for your server centre? Paul Hudson finds out...

## BUYER INFO

Mid-range Xeon server at a great price. For a little more power consider a low-end Opteron unit, or for an even cheaper system consider the SR-113 reviewed in LXF40.

- **SUPPLIER** Evesham
- **PRICE** £1199+VAT
- **WEB** [www.evesham.com](http://www.evesham.com)

**O**n April 22nd 2003, AMD bet its survival on its new AMD64 architecture, of which the first instalment was Opteron. The launch, as well as the ramifications of it, was the cover feature in LXF41, and since then the Opteron (and now its younger sibling, the Athlon64) has been taking on and defeating all comers. So, is the future AMD64-only? Well, no – the fight with the Itanium may yet prove to be longer than AMD had hoped, and hundreds of thousands of companies rely on Intel's Xeon architecture and will continue to do so for several years yet.

Evesham Micros, a company well-known for producing high-quality systems for the home user, are now making inroads into the server market by following its usual scheme of doing everything to cut the cost without cutting the quality. Is there life in the old Xeon dog yet, and, if so, can Evesham make it a real contender when it has to compete against some heavyweight 64-bit adversaries?

## The Incredible Bulk

The Evesham Reliance 500CW, if it were a rack-mounted machine, would easily fill 4U of rack space thanks to it being a particularly large machine. However, instead it comes in a tower case and so isn't destined for a rack; thus its size is about the norm. Design-wise, the case is fairly plain, and is so generic you wonder whether it's simply rebadged by Evesham.

Inside the box, there's a single 2.4GHz Xeon chip with 512KB of cache, which makes it a pre-Gallatin model. This is backed up by 512MB

RAM, and two 120GB SATA drives, each with 8MB of onboard cache. There's a fairly standard CD-ROM drive in there, but one thing that does stick out is the unusual choice of graphics card – it's a 128MB ATI Radeon 9600 card that even had our chums over at *PC Format* impressed. Most servers come with a measly 8MB card that can usually just about scrape through X, but this thing can smoothly run at 1600x1200 in true colour – heck, this thing should run *Unreal Tournament 2003* without a hitch!

Thanks perhaps largely to the size of the machine, it's not really so noisy. We've had some real air blasters in for review recently (see the Systemax Itanium over the page for a great example), and this machine is a nice change simply because it doesn't make *Mac Format* (who sit about 50 metres away from us) turn and stare. It's not silent, nor is it really classifiable as quiet, but, as Goldilocks would say if she wrote server reviews, it's "about right".

## Asthmatic ant?

This time last year, Xeons were the paragon of x86 performance and were able to stand on the leaderboard unchallenged. The Age of the Opteron is well and truly upon us however, and it would be foolhardy to benchmark any machine without placing it into proper perspective. This is a single-CPU machine, with a fairly small amount of RAM as servers go, and with IDE hard drives – performance is *not* likely to be mind-blowing. In order to test properly, we would much preferred to have taken off the crippled Red Hat installation off and replaced it with the ever-popular SLES 8, however the system has a very specific RAID card internally, and the system came bundled with the driver for Red Hat 9 only.

The results are relatively in-line with each other, and what we'd expect from a machine in this class – if anything, the fairly level results are





## MATCH YOUR SERVER WITH DESKTOPS

Back in *LXF43*, when we reviewed our last Evesham machine, we were glad to see that a trusted desktop supplier such as Evesham was making Linux publicly available at such an excellent price. Sadly, by the time the magazine carrying the review hit the shop shelves, Evesham had already pulled the

machine from their catalogue, and it was no longer available to buy. Here at *LXF* we'd like to see Evesham produce and sell a Linux desktop system such as the one we reviewed, and, if you agree, write to [customer.care@evesham.com](mailto:customer.care@evesham.com), CCing in [lxf@futurenet.co.uk](mailto:lxf@futurenet.co.uk), and speak your mind!

actually a good thing because it shows that there are no lurking problems in the configuration of the machine. In this respect, Evesham has done well in getting all parts of the machine to perform well, without any obvious bottleneck anywhere.

The most interesting score is the OGGENC result at 3.43, which is outstanding because we would have expected something quite a bit lower for the 2.4GHz CPU powering this box. Clearly Evesham has made sure that this CPU is kept busy at all times, which makes this machine a suitable candidate for performance computing work if your budget is quite tight.

### Support is key

As mentioned, the last time we reviewed an Evesham machine (back in *LXF43*), Evesham's support is excellent, and has been for as long as anyone can remember. Whether or not this will translate into the business world is yet to be seen – business users are usually more vocal in their requests for support, and usually demand a fairly quick turnaround. To deal with fairly simple technical queries, Evesham operates telephone support from 9am–5.30pm Monday to Saturday, and there's also 24x7 support available online. For more serious problems, this server comes with a three-year warranty, of which the first two years are on-site and the last is 'return to base'. We're not sure quite how companies will make use of this machine, but are sure that the majority of possibilities wouldn't take well to the server being whisked away to a workshop for two weeks!

To help keep costs down, Evesham has bundled this machine with a vanilla install of Red Hat 9. Red Hat provides very little support for this distro, particularly in the business environment, where Red Hat's Enterprise Linux line would be much more suitable. If you have little need for support, Red Hat 9 is likely to be more than enough as it's easy to administer,

free, and comes with more recent versions of most of the software.

Our unit didn't come with a keyboard or mouse, although there were a few manuals in the box about the motherboard and the system in general. Having said that, with the unit itself being so big, it's not surprising there wasn't much room left in the box! When it comes to connectivity, you have one USB port on the front next to the floppy drive, plus a further three around the back. USB is still not all that popular for servers, but it's good to see that the option remains there. There are also two network ports at the back to wire up to your network – one is 10/100, and the other is gigabit. This is a minor niggle, but it would be nice to have the two NICs at full gigabit speed.

### Double-edged

It's hard to say that any part of this machine is cutting-edge simply because it's all using technology from this time last year. Furthermore, with a single CPU and very little RAM, this server is not likely to excel when it comes to anything that will put the chip hard to the test. However, this all needs to be taken in light of the fact that this machine is only £1199 before tax, and is therefore in roughly the same price bracket as the Gigabyte SR113 we reviewed in *LXF40*, which came in at £872 before tax. Compared to that, the CPU is the same, the RAM is halved in the Evesham machine, and the disk space is more than doubled – and the SR113 was at that price almost a year ago, so its price is almost certainly lower by now.

Perhaps the Evesham machine's biggest advantage is the tech support that it comes with – 2 years on-site maintenance is more than enough to get any unusual problems with the system fully worked out, and the extra year, albeit return to base, is a welcome addition. Does the support justify the extra cost? Certainly, especially considering we know for a



**Beneath its ugly fridge-like exterior lies an extremely ugly interior...**

fact that Evesham continues to offer the finest retailer technical support we've ever encountered.

This machine doesn't have the latest hardware in there, but it certainly does have *good* hardware in there, and Evesham makes the most of this with their usual build quality. Backed up by good tech support, as well as a price that is fairly hard to match from most manufacturers, it's clear that Evesham is currently targeting the small-to-medium enterprise market with this machine. Larger businesses will probably want same-business-day support and perhaps even a four-hour turnaround, which is well over the market for this machine. As it stands, though, SMEs are getting a great deal with this machine, which shows that Evesham has clearly done its market research well. **LXF**

### BENCHMARKS

HD	2.88
APACHE	2.20
MYSQL	0.55
COMPILE	1.40
OGGENC	3.43
OVERALL	2.09

### LINUX FORMAT VERDICT

FEATURES	8/10
PERFORMANCE	7/10
EASE OF USE	7/10
VALUE FOR MONEY	9/10

Great value-for-money but no world-beater performance-wise; but quite how a 'return-to-base' warranty works for enterprise? We'll have to wait and see.

**RATING** **8/10**





## BARGAIN SERVER

# Systemax Mission 6507

If you've never heard "budget" and "Itanium" in the same sentence before, **Paul Hudson** has found just the machine for you...

## BUYER INFO

Low-end Itanium done on to a tight budget. For a high-end Itanium machine, consider the HP machine reviewed in *LXF48*. For cheaper and more powerful Opteron machines, consider the Armari server reviewed in *LXF45*.

■ **SUPPLIER** Systemax  
 ■ **PRICE** £4999+VAT  
 ■ **WEB** [www.systemax.co.uk](http://www.systemax.co.uk)

**W**e're going to come straight out and say it: we think Itanium is the most technologically advanced computer architecture currently on the market. There, it's been said, and we imagine more than a few of you are already mentally chanting "Opteron, Opteron, Opteron!", so let us clarify somewhat. The Itanium is usually over-priced; is often over-kill for the uses it's currently being put to, and always a bad choice if you're looking for any semblance of x86 compatibility. It is a redesign from the ground up – the x86 core that has been so successful over the years was dumped in its entirety, and replaced with the new RISC architecture of which we speak so highly. In 'geek-speak', the Itanium has 256 registers, at least 1.5MB of cache, its much-vaunted machine check

architecture, and the combined power of Intel and HP to power it forward. If you want a high-performance computer and have no care about the cost or backwards compatibility, Itanium is the bee's knees.

However, if you *do* care about cost – and let's face it, who doesn't – then its more than likely you'll either be considering an Opteron deployment or you'll have deployed Opteron already. Although this might seem cut-and-dried, there's a new range of Itanium hardware on the horizon designed to lower the overall cost-of-ownership of an Itanium solution. This was partly prompted by the 6MB cache Itanium chips released a few months ago, which helped push down the price of their smaller-cached cousins, and partly because many now believe the writing is on the wall for Intel's current 64-bit plan.

Systemax, a company long-known for providing server systems at low prices, is at last moving into the Itanium arena, and, thanks to a new SuperMicro Itanium motherboard and some particularly aggressive pricing (even for Systemax), it has managed to get its new offering into the sub-£5000 bracket.

Inside this box there are two 1.4GHz Itanium 2 chips, each with 1.5MB of cache, which technically

makes them the previous generation of Itaniums as the newer versions come with 6MB each for maximum performance (and maximum cost, too). Backing them up is 2GB DDR ECC RAM, 400GB of disk space, and two gigabit Ethernet NICs for solid networking performance.

## Raising the Itanic

That might seem like a fairly vanilla setup, but there are three key points to note about it. Firstly, although the CPUs aren't the newer 6MB chips, they are still only 100MHz behind the faster Itanium chips currently available. Furthermore, it seems unlikely that Intel will be scaling up the Itanium 2 much further in the next year, which means 1.4GHz is respectable now and will still be respectable this time next year. Secondly, even though the RAM is ECC-registered and DDR2100-compliant, there is still just 2GB of it. Now, correct us if we're wrong, but we thought one of the key benefits of switching to 64-bit is that you can finally break through the 4GB memory ceiling that inherently constrains 32-bit CPUs. Why, then, does this machine come with an amount of RAM that any 32-bit CPU could handle in its stride, and do so at 1/10th the cost? Furthermore, remember that RAM gets

very expensive when you ramp up the capacity of each module beyond 1GB – a 4GB stick from Crucial, for example, will set you back £4000 before VAT, and the HP Itanium we reviewed in *LXF48* had three of these.

Finally, the hard disk configuration displays another interesting piece of economisation by Systemax: the 400GB of space is split up into two 200GB UDMA IDE drives chained through a RAID controller, which is certainly a first for Itanium systems. However, having IDE drives in a serious server does limit its usefulness quite substantially due to the inherently slow disk access speeds, and this problem is likely to be compounded as the system only comes with *two* drives – insufficient for fault-tolerant RAID operation beyond simple drive mirroring, which has the potential to slow the system down even further.

## What it does well

So, with such little possibility for high-performance when RAM or hard disk is stressed, the focus of this box is very firmly on the CPUs. This is the first Itanium 2 hardware we've seen to sneak under the £5000 barrier, but are these chips really worth that much?

One expert cited that Java code, because of all the checks it does





internally and the massive amount of abstraction that takes place internally, has an average method size of just 68 bytes. Furthermore, one in four Java instructions is a null or bounds check, and over two-thirds of Java method calls are virtual – that is, multiple levels of indirection need to be navigated through in order to execute them. This is no bad thing by itself, and this is reflected in the fact that the number of Java-based viruses continues to hover around the zero mark. However, it does mean that Java code is notoriously hard to squeeze performance out of with the majority of architectures.

On Itanium, however, and this even applies to the lower-end CPUs featured in this machine, it's almost uncanny how well-suited the architecture is for this sort of situation. Branch prediction is all about pre-executing all possible outcomes of a situation before the

check is reached then simply following the correct branch immediately after the answer is known. Itanium, with 256 primary registers and 8 branch registers, as well as its massively parallel architecture, is the perfect candidate for a language where at least one in four instructions results in branching. Of course, having 2.8GHz of pure 64-bit computing horsepower helps a lot, too!

To mitigate the obvious hard drive bottleneck problem, this machine does have space to hold up to four drives, although you'll need to add these to the spec yourself. If you get these in place, you will of course be able to run RAID 5 properly, which should bring the overall disk performance up to scratch.

### Falling down

The one place where the Mission Itanium falls down is on RAM, as it comes with just 2GB. While this might not sound like a problem, the RAM is

spread across four 512MB modules, which takes up half of the available slots on the board – unless you throw away the RAM that comes with it, the maximum you'll be able to get into the board is 4GB, which is still fine for a 32-bit computer. If you're willing to throw away £300-worth of RAM and replace it with a lot more, this won't be a problem, and it will also actually let you leverage the 64-bit nature of the Itanium chips.

Secondly, and perhaps more crucially, is the amount of noise this machine makes. The Armari Opteron server we reviewed back in LXF45 was extraordinarily loud, and, by some feat of mechanical engineering, this server is louder. Opteron-based machines are, we feel, understandably well-cooled – if the Opteron chip runs anything like as hot as Athlon chips (which is quite likely), they need all the fans they can get. *Itanium*-based machines, however, are generally very cool – the HP we reviewed in LXF48 was icy cool at all times, and was also very quiet. Part of this can be attributed to the larger case of the HP machine, which allows more air-flow and ventilation internally, but we think it's just a matter of cheap fans being used in this machine. Yes, servers like this are rack-mounted in air-conditioned datacentres and so noise isn't going to be a problem, but something in the back of our heads tells us that walking into datacentre shouldn't be sonically similar to walking into a thrash-metal gig.

Finally, the available ports are quite limited – it seems that Systemax has not heard of the PS/2 port, as this machine has none of them. On the flip side, there are four USB ports to make

up for the lack of PS/2. Of course, not every server room has a USB keyboard around – we ended up borrowing PS/2 to USB converters from the nearest magazine and using that with our usual kit.

So, what we have here is a 1U server that's extraordinarily noisy, under-powered on the hard drive and RAM fronts, but powered by two of the architecturally most advanced CPUs on the market. Does the combination work? If you're doing HPC work and have no need for much RAM, this will fit your needs to a tee. However, if you're not in that 0.01 per cent demographic, it's likely that some area of this machine will require some modification before it fits your needs. Of course, Systemax can make these changes for you, whether that be to add more drives, more RAM, etc, but this will stretch the price a little.

What this has shown is that it is currently very difficult, if not impossible, to make a budget Itanium system without serious compromises on the other hardware. If you're willing to add another grand to the price tag you should be able to get twice the RAM or perhaps get the hard disks changed to SCSI, both of which will make the system a solid performer for most markets and still at quite a low price. The primary advantage of this system is that its price starts low, and you can make your own configuration changes to tailor it to your own requirements – if you don't want SCSI, you don't have to pay for it.

For the price, we don't think you're going to get much more for your money – Systemax has certainly cut its profit margins right to the bone here. If you reconfigure it by adding some more RAM or disk space, you'll have a very usable and flexible machine that can take full advantage of the Itanium architecture without requiring you to sell your grandmother or remortgage your house. **LXF**



Four drive bays, but only two hard drives – that's one way of keeping costs down! There's no PS/2 port either...

### LINUX FORMAT VERDICT

FEATURES	7/10
PERFORMANCE	7/10
EASE OF USE	8/10
VALUE FOR MONEY	10/10

An inexpensive machine that is maybe a little too cheap for its own good?

**RATING** **8/10**



MS WINDOWS APPS ON LINUX

# CrossOver Office 2.1



Getting to grips with Linux when it's your first time is hard, so why not try using your old Windows apps? Paul Hudson shows us how it's done...

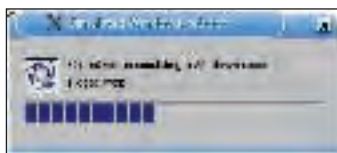
## BUYER INFO

Application based on Wine that runs Windows APIs on Linux to allow full MS Office productivity and more.

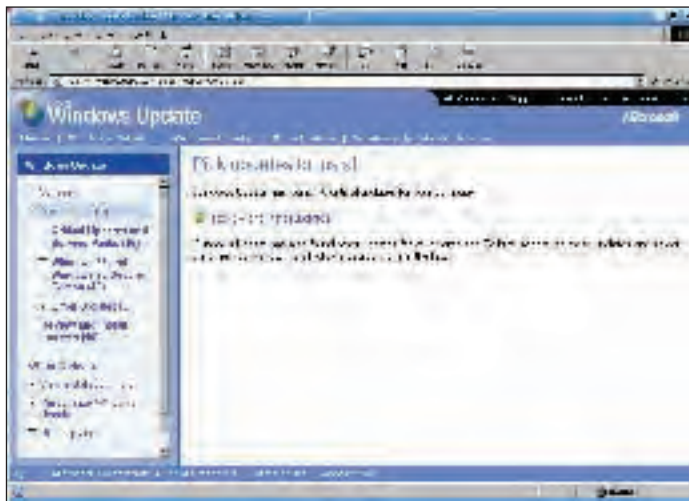
- **DEVELOPER** Codeweavers
- **PRICE** From US\$59.95
- **WEB** [www.codeweavers.com](http://www.codeweavers.com)

**W**e all know that the big advantage to using Linux at home is that you have a great selection of software at no cost, and you can pick and choose what suits you best. When it comes to office software, some people use *OpenOffice.org*, some, including Linus Torvalds, use *KOffice*, others use *Abiword* and *Gnumeric*, and still others, including the *Linux Format* team, rarely stray out of *Kate*. While this choice is a great boon for those of us comfortable with using Linux, we often get emails from newcomers saying that the choice overwhelms them and that Linux is "just too different" for them to get to grips with.

Although we do recommend people switch away from proprietary software, we also feel there's a real advantage to be had by letting people continue to use software they are used to after they've switched to Linux – *VMWare*, for example, allows people to run all of Windows in a virtual machine, and therefore means they can stagger their migration to Linux. While this is good for people who need all the functionality of Windows, it does mean an awful lot of overhead if all you want to do is open an *Excel* document that *OpenOffice.org* doesn't manage to get quite right.



**CrossOver Office automatically 'reboots' its fake Windows setup as necessary, and luckily it only takes a few seconds.**



**Luckily CrossOver Office doesn't simulate the security holes, as Windows Update thinks that we'd have to download 59 fixes and updates!**

If this describes your current way of working, you could benefit from trying out Codeweavers' *CrossOver Office*, now in v2.1. Codeweavers hit the headlines when it released *CrossOver Plugin*, which allows many ActiveX plugins for *Internet Explorer* run on Linux, including the Apple Quicktime and Windows Media Player Player plugins – functionality that is still not available outside of Codeweavers apps. This release was then followed up by *CrossOver Office*, which allowed *Microsoft Office 97* and *2000* to work smoothly in Linux.

The 2.0/2.1 release of *CrossOver Office* adds support for *Office XP*, *Photoshop 7*, *Dreamweaver*, and *Flash*, which should be able to attract even more users to Linux by making their favourite programs available. Of course, the key problem with producing a simulated Windows environment like this is that you're always playing catch-up with the latest release of the software you support, but we'll get onto that later.

## Leap of faith

Codeweavers bases its products on the *Wine* project, which is an Open Source implementation of the Windows APIs. Note that WINE is technology an acronym – "WINE Is Not an Emulator"

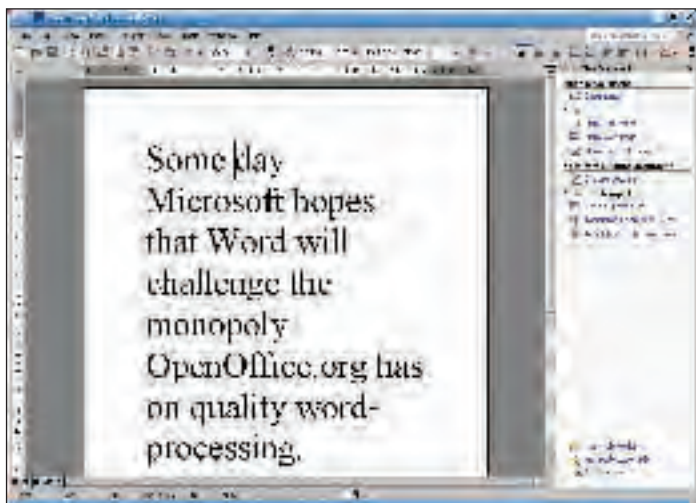
– which is there to remind people that *Wine* does *not* necessarily run slower than its Windows equivalent as there is *no* emulation between Windows and Linux code. Many people even report programs running *faster* under *Wine*, ostensibly as a result of having Linux as the kernel.

In the same way as *WineX* builds upon *Wine* for the purposes of gaming, the Codeweavers development team has repackaged *Wine* for the purpose of specifically handling certain applications. As well as adding a lot of

new code to its port of *Wine* to help its supported applications work more smoothly, the company also provides an easy installation package for programs that it supports, and also the facility to automatically add menu items and file associations for programs that are installed.

Thanks to Codeweavers making sure it contributes a lot of its work back to the community, you can actually use large parts of *CrossOver Office* using the free version of *Wine*, so a lot of the importance of *CrossOver Office* lies in what it adds above and beyond the stock *Wine* distribution. There are some parts of the code that are still available only with Codeweavers, and this does make general operation smoother. Although this extra code is nice to have, it's the easy installation wizard is what makes it truly useful.

Using this wizard you select the application you want to install (or, for the brave out there, you can even try installing an unsupported application), and it guides you through the whole installation, even simulating a Windows reboot where necessary. Furthermore, and this is the *really* clever bit: the installer can detect missing Windows components and automatically download them from the web (from Microsoft) and install them.



**Microsoft Word XP is fully functional, and should you be some sort of pervert, you can even play with Clippy to your heart's content.**





**Not officially supported but we couldn't resist pushing our luck – best to wait until Codeweavers gives the green light!**

Once the installation is complete, you'll find your new software in a submenu 'Windows Applications' on your applications menu, and this is ordered pretty much like the Start menu in Windows – there's a Programs submenu in there, and *CrossOver* will add icons as appropriate to that. For people who want the full Windows experience, you can have even have icons added to your desktop!

### Accurate simulation

Given that Windows is a distinctly closed-source product, with Microsoft showing so much aversion to the idea of Open Source that it often prefers to use the term "source-available". As a result, you might think it was incredibly difficult to make Windows apps run under Linux, and you'd be right – it's taken quite some time to get things up to the current level.

We found that *CrossOver 2.1* was able to run all the parts of *Office XP* that we tested flawlessly, which is quite an achievement. *Office 2003*, on the other hand, refused flat out to install on the basis that we apparently had the wrong version of Windows. On the upside, *Internet Explorer 6* also works flawlessly, including directing us to the Windows Update site, as apparently our 'version' of Windows needed quite a few patches!

One thing that continues to impress us is CodeWeavers' "truth in advertising" policy, which means that they list exactly what is and is not supported in their product, exactly what you can expect in the form of support, and exactly where your money is going. If this sounds too good to be true, try this quote from the policy out for size: "we will make *CrossOver Office* live up to our claims of what it will do, and **we will make it do so on your machine, and in your environment**" (emphasis theirs). As a result of this up-front honesty, you buy the product in full knowledge of what it can and cannot do, which is very reassuring indeed.

So, what's the difference between *CrossOver Office* and just using *Wine*? Well, because Codeweavers hire several key *Wine* developers, it is also very careful about giving back large chunks of its code to the community, which means that about 95% of *CrossOver* and *Wine* is the same. The company does license the Apple font-hinting code, however, which means that you should get very smooth fonts in your Windows apps even if you don't have X configured terribly well. Codeweavers' big advantage is the ease of use it brings – installing apps using *CrossOver Office* is really as easy as it gets. You select your product,

insert the CD, and follow the wizard as you would normally do in Windows. When appropriate, it will simulate a Windows reboot, then will automatically create the icons for you on your programs menu, add associations, and more. When it comes time to uninstall, *CrossOver Office* will handle that for you also, similarly removing all the icons and associations with no input required.

*CrossOver Office* is able to support this kind of use because CodeWeavers has so finely tailored its product support – if you try to install unsupported apps, you will likely find many will fail straight off. Having said that, we did get a newer (unsupported) Windows Media Player installed and working fairly well (above).

It's this kind of simplicity that is what makes *CrossOver Office* a hit – you don't have to configure libraries, edit config files, cross your fingers, or hunt around for font files because it does all the hard work for you. Whenever it detected our Windows installation was missing any files, it would automatically connect to the Web, download them, and install it all before continuing the installation. Technically speaking this is an easy way to avoid fuss, and from an end-user's perspective this makes installing *MS Office* on Linux as easy as installing *MS Office* on Windows.

### Future upgrades

*CrossOver* supports *MS Office 97, 2000, and XP*, but as you probably know, 2003 is already available and not supported by *CrossOver*. Similarly, it supports *Photoshop 7* when *Photoshop CS* is available, and it supports *Dreamweaver MX* and *Flash MX* when *MX 2004* is available. When we tried to get *Dreamweaver MX 2004* to install, it failed quite drastically, which means you really need to use very specific versions of the supported products.

Naturally it's not really fair to expect Codeweavers to be able to support products as soon as they are released, but the catch-up game is likely to put a few people off. Having said that, Codeweavers is already working on *MS Office 2003* support, and is likely to also be working on supporting the new releases of other products too.

Although this might not sound very useful if you're trying to get *Photoshop CS* to work, you'll be pleased to hear that when you purchase *CrossOver Office*, you get six months worth of product upgrades included in the price, which means you get to take advantage of the latest fixes and application support upgrades. Of course, it's also nice to know that you're supporting a company that is a huge backer of the Open Source *Wine* project, so by helping Codeweavers you're helping the community.

Overall it's hard to say a bad word about this product – it does precisely what the authors say it will, and criticising it for not supporting unsupported applications is flat-out unfair. The added bonus of getting free updates, having the option to install unsupported software, and contributing towards the Open Source movement makes this a very worthwhile purchase that we simply cannot recommend highly enough. **LXF**

### LINUX FORMAT VERDICT

<b>FEATURES</b>	<b>10/10</b>
<b>PERFORMANCE</b>	<b>10/10</b>
<b>EASE OF USE</b>	<b>10/10</b>
<b>VALUE FOR MONEY</b>	<b>10/10</b>

If you want to use your Windows applications on Linux systems, this is the place to look for an instant solution.

**RATING** **10/10**  
 ●●●●●●●●●●

## PROJECT MANAGEMENT

# Seapine Surround SCM v2

**Jono Bacon** takes a look at the newest latest version of this versatile development tool.

## BUYER INFO

If the command-line nature of *CVS* doesn't appeal, you could warm to this very quickly.

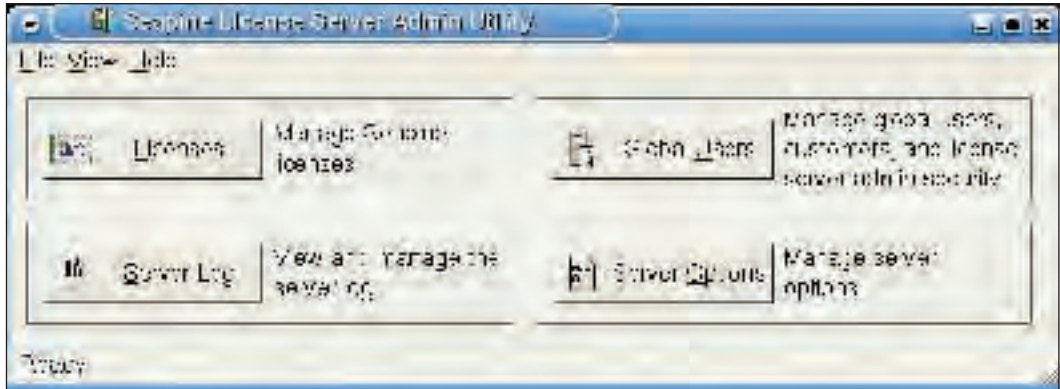
- **DEVELOPER** Seapine
- **PRICE** From £295 + 20% maintenance + VAT
- **URL** [www.seapine.com](http://www.seapine.com)

**A** while ago in *LXF44* we reviewed of an earlier version of *Surround SCM*, and the conclusion of that review was that the software was simple to install and use – overall a good product. When we were asked to do a review of the newer version of *Surround SCM*, we were interested to see how the new features would shape the product. For those who are not familiar with *Surround SCM*, here's a quick overview.

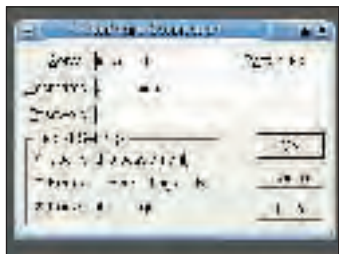
*Surround SCM* is a source code control system – if you have used a tool such as *CVS*, *BitKeeper* or *Subversion*, you will have an idea of what this software can do. The software offers the functionality to add files to a centralised server, manage updates to the code by adding revisions and create log entries associated with those revisions. Seapine has developed *Surround SCM*, to create a graphical interface to this source code management server; a feature that many source code control systems lack due to their command line operation.

## Installation

Strangely, we found installation of this newer version to be *more* of a chore than the first version. This may well be due to the fact that we still had the binaries from the first version cluttering up the system, but this shouldn't cause problems. The first issue was that the Java installer failed to work when started, and no combination of techniques seemed to fix the problem. As such, we made use of the normal command-line installation method to install the software. Aside from a few head-scratching moments trying to figure out how the licence server and the main *Surround SCM* server worked, we managed to get the system running.



The licence manager can ensure your serial numbers work easily for setting up, adding or removing users.



*Surround SCM* has a well thought-out graphical interface to log in and manage code.

These installation issues were a big surprise to us given the fact that the installation was seamless with the previous version of *Surround SCM* – it'd be good if Seapine would improve things in this area.

## In use

*Surround SCM* is fairly similar to the previous version – you'll find the same great interface to source code control and management, and the interface continues to work well. User interface design is something that we suspect Seapine has spent some considerable time developing – it feels smooth and efficient. The only possible criticism in this area is that some of the toolbar buttons can be a little confusing to determine their function. The other issue is that when you first log into the server, you are pretty much on your own. When we reviewed *Omnis Studio* last issue, we really liked the introductory wizard that helped get user's started – it would be great to see such a feature with *Surround SCM*, and this would greatly ease learning the tool.

*Surround SCM* v2 brings a number of new features to the application, and much of this involved linking in with other applications to make *Surround SCM* a far more intrinsic development tool. As an example, Seapine has included support for *Dreamweaver MX* and *Borland JBuilder* to link with *SCM*. We weren't able to test *Dreamweaver MX* with the *CrossOver Office* suite to determine how well this works on Linux, but *JBuilder* support is a useful addition, and it'd be nice to see this integration extend to tools such as *Quanta* and *KDevelop*. Other additions include some security improvements and support for triggers, which are small scripts that can be run before or after an event in *Surround SCM*, so each change to the code could trigger another process. This is another programming aid to ensuring *Surround SCM* works well with other tools in the developers toolbox. Another useful addition is the availability of emailing developers automatically when certain changes have been made to code. This can then prevent the ominous code conflicts that can occur with distributed development.

## Documentation

Documentation with *Surround SCM* is very similar to the previous version, and we didn't notice any obviously significant improvements or additions. The documentation is good and details much of the process of installation and using *Surround SCM*. One criticism here though, is that the Unix and Linux support seems to be somewhat of an

afterthought, with a bias towards Windows systems. Another problematic issue is that there is very little troubleshooting advice in the documentation, and when we encountered my installation issues we found the documentation was not entirely useful in resolving my situation.

## Conclusion

Once again, *Seapine Surround SCM* is a good product. There is no doubt that Seapine is working to push the realm of what their product can do, and the additional features to integrate with other applications are a good sign. Installation was disappointing, and we suggest that Seapine focuses on this area. Documentation is good, but a little troubleshooting information would help in times of frustration. Overall we were impressed with *Surround SCM* and the progress Seapine is making – if you need commercially backed source control, this product is definitely a good choice. **LXF**

## LINUX FORMAT VERDICT

FEATURES	8/10
DOCUMENTATION	7/10
EASE OF USE	8/10
VALUE FOR MONEY	7/10

A full-featured tool that integrates well with other software. If you need a commercial source control system, you can't go far wrong with *Surround SCM*.

**RATING** 8/10





## STRATEGY GAME

# Knights and Merchants

Reclaim your rightful kingdom with Sir Nick Veitch...

## BUYER INFO

Resource management/strategy game. Similar to Open Source *Freelords* project.

■ **DEVELOPER** EPIC  
 ■ **PUBLISHERS** LinuxGamePub.  
 ■ **PRICE** £25  
 ■ **WEB** [www.linuxgamepublishing.com](http://www.linuxgamepublishing.com)

**T**he title of the game, in this case at least, doesn't really give the game away. If you think that you are getting something like *The Patrician* but with more of a combat element, you're wrong. There's not any trading going on, except with yourself. So what is actually involved? I will refrain from mentioning the name of a certain game lest I open the floodgates for the

evil shysters to ply their trade. Suffice to say, imagine a game called something like *Inhabitants* and you pretty much have the mechanics of how this game works.

In traditional resource-management style, you start off with a few serfs and have to build a thriving community by building the right sort of buildings in the right places, and preferably in the right order. The interdependencies will drive you a bit bonkers, especially when you find you can't build your stone quarry because you don't have enough stone to build a road to the door. But that's what ultimately made similar games in this genre wane in popularity. While it is rewarding in some ways to watch the town you have planned take shape (with occasional razzings from the local ruffians), a lot of it is just tedious.



**Wave upon wave of demented avengers march cheerfully out of obscurity into the dream. The AI isn't up to much, but there's no easy fight.**



**Sausage sandwich=Farm+Windmill+Butcher+Baker+Ketchup maker...**



**The foremost cartographers of the land have prepared this map.**

## Let's do lunch!

There are also a few unpleasant quirks. The inhabitants seem to have set mealtimes. Just when you wish they would all hurry up and finish some very urgent project, the little blighters will all disappear into the nearest inn and scoff the results of your hard labour. Well, technically it might be their labour, but that's the trouble with these underlings, they never understand the pressures or the awesome burden of responsibility.

Annoyingly, no matter how many workmen you have, they tend to focus on the jobs in some sort of priority order, with roads always seeming to be the highest priority. Be careful when ordering constructions – it's often better to build one thing at a time.

The AI of the opposing forces seems a little weak. They act in a fairly predictable manner and fail to take advantage of obvious opportunities. For the most part they indulge in a fairly static defence with the occasional sally forwards. In some missions there seem to be pre-determined triggers for this so you can work out a strategy in advance. This reduces the strategic intelligence required to win somewhat – put up a defence screen, then take as long as you like to construct a mighty war machine and, when you are ready, unleash total annihilation on your foes. That said, as the control of your own

forces is often so clumsy, it can be a closer run thing than you might like.

The missions, do get tougher, but even easy levels take some time to complete. This is largely to do with the sheer volume of buildings you need to construct in order to equip the most rudimentary military force. There is certainly a lot of longevity in this game, and to be fair, although the concept and the game itself is a bit dated, the gameplay is there and it isn't a bad example of the genre.

The graphics and interface are passable enough, the sound what you would expect from game of this age. There isn't that much wrong with it, apart from being a little dated, and you can expect to spend many a happy hour cursing at your miniature 'colonists' and exhorting them to move faster, work harder and not die quite so easily. **LXF**

## LINUX FORMAT VERDICT

<b>FEATURES</b>	<b>5/10</b>
<b>PLAYABILITY</b>	<b>8/10</b>
<b>GRAPHICS</b>	<b>7/10</b>
<b>VALUE</b>	<b>7/10</b>

Dated, but competent and playable, and good value at the price.

**RATING** **7/10**



## STRATEGY GAME

# Software Tycoon

Nick Veitch reckons he can create a better game than this one...

## BUYER INFO

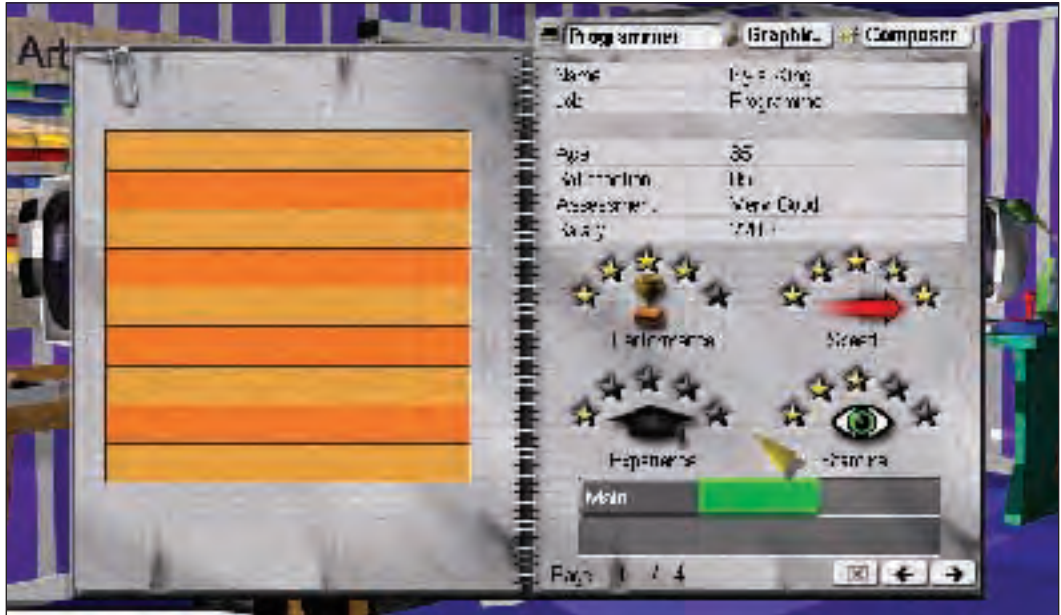
Management game with a distinctly capitalistic bent: this sort of thing will be on the National Curriculum soon...

- **DEVELOPER** EPIC
- **PUBLISHERS** Linux Game Publishing
- **PRICE** £20
- **WEB** [www.linuxgamepublishing.com](http://www.linuxgamepublishing.com)

**T**here's a degree of commonality to all these games. You could be making pizzas; or trying to knock *Girls Aloud* off the top of the charts (or preferably, out); or indeed selling just about anything. The mechanics are the same. Employ people, decide on concept, create product, market it, sell it. Use money to start new project. Repeat until you win.

This game is no different. Research game genres, sound, graphics and programming techniques, then create a concept for a game by mixing these elements together. As a further twist, you can negotiate for a film licensing tie-in to help shift copies of an otherwise mediocre effort (such realism!)

The mechanics of the game involve traipsing up and down the High Street, popping into various buildings to perform necessary tasks. Hire people in the video arcade, visit the warehouse to package your game, visit the shop to check on the charts, nip into the off-licence for a quick... oh, there isn't one. Once your game is under development, there is little to do but hit the accelerate time button



Options allow for a significant amount of micromanagement – but without a film sponsorship, you're vapourware.

and wait. And here we come to a major flaw – the game development model doesn't make sense.

The various components of the game equate to sub-tasks. One programmer may be required to tackle AI, another will work on the main code, another will work on scrolling for example. There is no way of sharing out these tasks, or even swapping the programmers allotted to them. Basically this means no matter how big your company gets, or how many are on the team, games will take roughly the same time to develop – the speed at which your lead coder can get

through the main code. I'm sure someone will bring up the mythical 'man month' and make a good case for it, but you can't even switch from one programmer to another.

## Tie-in fighter

To compound the misery, you can only speed up time so much. There isn't much to do for a while whilst the hours tick away, except watch your bank account dwindle into the red. This is probably the most annoying aspect of the game; well, that and the endless clicks here and there. The further travesty is that you can only work on one software development project at a time – US Gold wouldn't have stood a chance.

As well as a free-play mode, there are a set of goal-oriented scenarios to explore – dominate the market, sell a million copies, create the perfect game and so on. As time drags on more options become available, and of course, more genres and coding tricks are discovered. Games become different, but not necessarily better, and to be honest if you think there is some magic formula to discover, you'll be sadly mistaken. The titles we made the most out of were licensed tie-ins with huge ad spends, plenty of packaging and very little development work.

If you think you might detect a disparaging tone to this review overall, then you might be surprised to find that, despite a host of annoyances, there is some germ of really addictive gameplay in there. For some reason, not really knowing why, you will plunge into round after round of the development tedium, battle with useless employees and the monotony of setting production runs, just because you are sure you can top the 'best games in the world ever' list in the local computer shop. You'll put up with the clunky interface, the annoying emails that pop up to stop the clock, the cumbersome interface and the long periods of tedium, because underneath it all there is a compelling element of gameplay (however well-hidden). [LXF](#)



High Streets show the bleak results of impulse-driven mass consumerism.

## LINUX FORMAT VERDICT

FEATURES	4/10
PLAYABILITY	6/10
GRAPHICS	3/10
VALUE	4/10

Old game, old concept, old notions of gameplay. For fans of the genre only.

**RATING** **4/10**





# Linux Toys

Linux is about web servers, databases, and work, right? **Paul Hudson** has other ideas...



## BUYER INFO

■ **AUTHOR** Christopher Negus and Chuck Wolber  
 ■ **PUBLISHER** Wiley  
 ■ **ISBN** 0-7645-2508-5  
 ■ **PRICE** £29.99  
 ■ **PAGES** 330

**W**ork hard and play harder – that's how the hackneyed saying goes, but how applicable is it to Linux? We already know that, as a workhorse, Linux is pretty much unparalleled when it comes to power and flexibility, but few people ever consider it as anything you can really have fun with. Sure, Frozen-Bubble and Tux Racer are addictive, but what do you do if you want to make your computer do unusual and cool things that give it a new lease of life?

To answer this question, two dedicated tinkerers have brought together a collection of 13 out-of-the-



ordinary ideas to make your machine come alive, and written them up in a step-by-step tutorial fashion with copious numbers of pictures and illustrations. The toys, which range from the fairly tame "home network server" and "music jukebox" to "digital picture frame" and "toy car controller", each come with a list of the hardware required before you start, as well as detailed instructions to guide you through any problems en route.

You get an average of 25 pages for every walkthrough – it might not sound like a lot, but the authors manage to squeeze quite a lot into each toy by keeping the amount of textual fluff to a minimum. One aspect that could be improved in a second edition is the lack of further ideas – that is, once each toy was finished, the conclusion was simply "This was what we did". What's missing is "This was what we did; if you want to extend your toy, why not think about doing...". For example, the digital picture frame

displays pictures randomly, but, to give readers ideas for things to try themselves, the authors might have mentioned "Why not try making your picture frame play videos?"

This problem is not serious though, and doesn't detract from the quality of the rest of the material. The authors write in a detailed, if slightly serious tone that starts each toy off at a simple level to get readers hooked, then manages to ramp it up so smoothly that even demanding techies should be happy with their accomplishments. The low price means that this is a worthwhile purchase even if you only try one or two of the toys: admit it – deep down you *need* to control a toy car with your laptop!

## LINUX FORMAT VERDICT

Lots of ideas for making your machine do cool things, and it's really not so hard either...

**RATING** **9/10**



# Linux Game Programming

Writing games for Linux doesn't have to be all that hard, as **Paul Hudson** discovers.

## BUYER INFO

■ **AUTHOR** Mark Collins, et al  
 ■ **PUBLISHER** Premier Press  
 ■ **ISBN** 0-7615-3255-2  
 ■ **PRICE** £29.99  
 ■ **PAGES** 331

**W**hen you're writing a game for Linux, many would say you have two options: use SDL for maximum compatibility, or attempt to use DirectX and rely on WineX to help your game work. Naturally, most people choose to go with option one, but most people don't realise there are other options – you can write powerful games that take advantage of *SVGAlib*, *Xlib*, or *OpenAL* if you have the right information, however the docs are generally not up to scratch for newcomers. This book, from long-time game book publishers Premier Press, attempts to fill that niche by providing coverage on SDL and alternate libraries all in one place.



Sadly, 330 pages simply isn't enough to get into the real details. This problem is compounded by the fact that many pages are wasted – we were stunned to see full copies of the GPL, LGPL, BSD, Artistic, MPL, Apache, and MIT licences included as appendices, along with 25 pages of information on the differences between *Microsoft Visual C++* and *GCC*, and also a chapter *Open Source: Friend or foe?*

that seems to be little more than a personal rant. So, of the 200 pages that remain, how much detail does the author get into on actually making games? Well, not all that much as you might imagine. Large chunks of the book appear to be filler, with such choice boxes as *Definitions of Dog-Fighting Tactics* – which even includes entries such as "Immelman: Pull back on the stick to fly inverted, then rotate the aircraft 180 degrees". And before you ask – no, we're not sure what that's doing in there, either.

Once you strip out the filler text, the peculiar boxouts, and the pages and pages on Open Source licences, what you have left is about 50 pages of hard knowledge that is, for the large part, unavailable elsewhere. There are very few resources on Linux game programming, which makes the OpenAL and SDL information given here a solid – if somewhat watered down – point of reference for novices. Furthermore, the whole book is very laid back, and most readers will find it easy to read even if they have never tried game programming before. As a book for anyone but an absolute beginner game creator, this book just won't work – there's too much fluff.

## LINUX FORMAT VERDICT

Very newbie-oriented, and suffers as a result. There are some sprinkles of genius thinly scattered throughout, though.

**RATING** **6/10**



# Automating UNIX and Linux Administration

Nick Veitch likes to do it without thinking...

## BUYER INFO

■ **AUTHOR** Kirk Bauer  
 ■ **PUBLISHER** Apress  
 ■ **ISBN** 1-5905-9212-3  
 ■ **PRICE** £24.95  
 ■ **PAGES** 575

The idea of automating common tasks with scripts is not a new one. It is what scripting languages were invented for in the first place. Automating complete system administration is probably a little further than anyone ever dreamt of when *bash* was a little boy. That is the goal of this book though, so certainly nobody can accuse the author of lack of ambition.

Early chapters detail common problems and how these may be addressed by scripts, and also the techniques used. One of the most important decisions to be taken is whether the admin system will use push or pull techniques on the clients



(ie whether the clients will have information broadcast to them, or if they need to request it).

A little disappointingly, these early stages deal with example scripts that the author has developed for his own specific use – while they are explained

in great detail, there is little here to suggest how you might implement different systems – an area that could have been covered more thoroughly in other parts of the book also.

Subsequently, the reader is introduced to *cfengine*, the GNU 'configuration engine'. Automated

administration is pretty much what *cfengine* was designed for, and the rest of the book deals almost exclusively with how to use this powerful but complex system to keep on top of admin stuff. So much of the book is devoted to *cfengine* that it's a wonder it didn't feature in the title!

Every aspect of the admins daily grind seems to have been covered, with detailed sections on monitoring, security (including using *Tripwire*), backup and filesharing.

Thankfully the author realises that a certain amount of devolved admin might be called for and looks at creating user interfaces too. There are great tips for automated timesaving here, but it could have been better.

## LINUX FORMAT VERDICT

Worthwhile, but more of a case study than a detailed guide.

**RATING**

**8/10**



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# Java 2 Game Programming

Andy Hudson sets off on a mission to re-create *Missile Commander* in Java.

## BUYER INFO

- **AUTHOR** Thomas Petchel
- **PUBLISHER** Premier Press
- **ISBN** 1-9318-4107-01
- **PRICE** £36.99
- **PAGES** 768

From my early days of playing text-based adventures, I've always wanted to build my own games. Games that I could design and build and enjoy, not only in the playing but also in the creation. Of course, things have come a long way from text-based adventures on the ZX Spectrum! Nowadays games are produced in any number of different environments for playing on a number of different platforms. Wouldn't it be great if I could create a game that would run on a variety of different platforms but wouldn't take me ages to port?

The obvious choice for this is Java as it allows the user to easily move code between Linux, Windows and other operating systems. No worries about



having to spend hours grappling with some annoying platform-specific problem! But when you look around at the books that are available, you find that the vast majority are tomes that deal with enterprise Java development – the kind of application development used in big business. Try and find a decent book that teaches Java application development, but that also talks about how to develop games and you will find that they are few and far between the masses of 'hardcore' developer guides/manuals/rainforests.

This book, however, shines for a number of reasons. First and foremost, it's not scary! I'm sure you can remember the first time you sat in front of your PC, and started work on 'Hello World'. For most of us, it was done in trepidation. With this book, it's done with fun. For Hello World, read Game Over. The book makes a huge effort to be as enjoyable and easy to use as possible. Examples are clearly commented, figures used where needed to demonstrate functions and a very well thought out chapter listing. There's even a section in each

part of the book entitled *Where we are, and where we're going*. All this helps keep the new or established developers on track to achieve their goals. Perhaps more importantly, even before any code is presented, the author sets out some tips to achieve good results. You can't help but smile at the suggestion that plenty of caffeine and sugar should be available for those late night sessions. That's another thing about this book – it's written in an approachable style that is very easy to read – yes – a programming book that is easy to read.

I'd highly recommend this book to anyone who wants to get to know Java, whether you're an experienced coder or someone who is wanting to dabble. **LXF**

## LINUX FORMAT VERDICT

A must-read for anyone who wants an introduction to Java, whether they're developing games or applications.

**RATING** **10/10**



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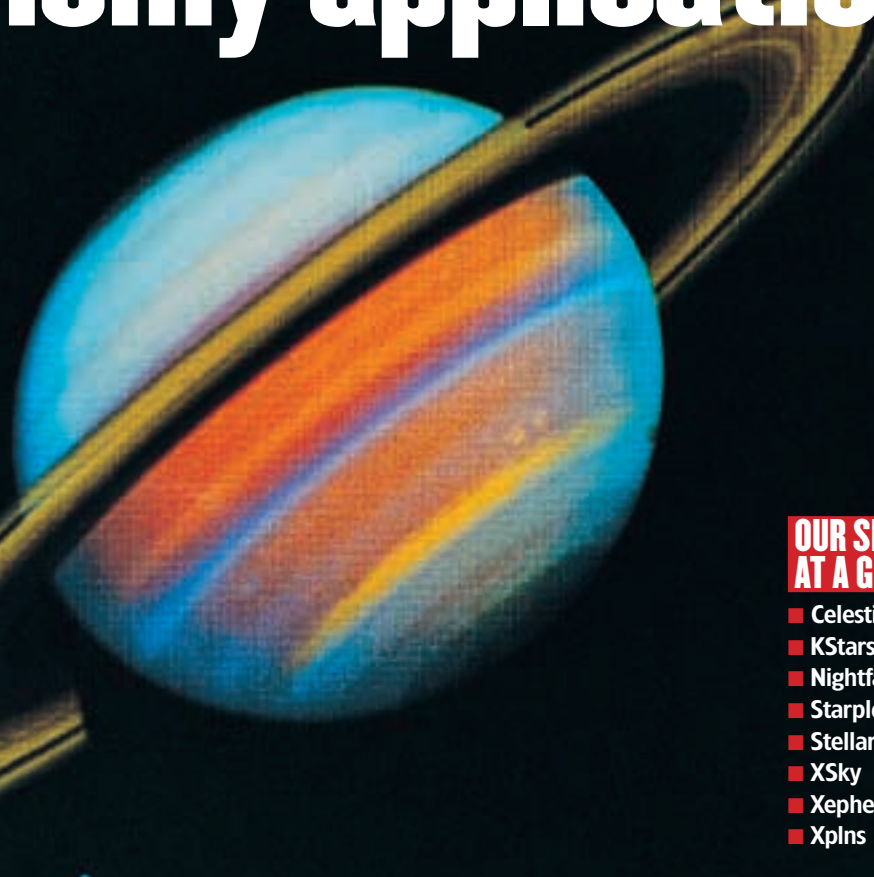
# Roundup

Every month we compare tons of software, so you don't have to!



## Astronomy applications

Do you want to be the next captain of the *Enterprise*, or maybe just figure out what's hanging over your head? **Marco Fioretti** shows how to make sense of the night sky with eight astronomy programs for Linux.



### OUR SELECTION AT A GLANCE

- Celestia
- KStars
- Nightfall
- Starplot
- Stellarium
- XSky
- Xephem
- Xplns

**T**he home page of one of the programs presented in this roundup points out that Astronomy is "a field in which even amateurs can make important contributions" – just like Linux! Even if one is not so interested in the scientific side of the discipline, the night sky is a truly magnificent sight. There is no need to become a professional astronomer to learn how to recognise the most important heavenly objects, and tracking them over the seasons can be a lot of fun. The same applies to intergalactic flight simulations.

As usual, Linux offers applications for all kinds and level of interests, from the quick-and-dirty 2D planetarium to

the tri-dimensional deep space rendering engines, passing through several varieties of specialised astronomical calculators.

There are also a lot of libraries for high-precision calculation and rendering of stars and similar. Some are so sophisticated that programs using them can take into account local atmospheric conditions: objects are displayed more or less out of focus depending on current fog, air temperature and pressure and so on. This class of tools is intended for more serious use, so will not be further discussed in this roundup, as the processing power required will be beyond the scope of most readers.

The applications selected for this roundup have in common two characteristics. The first is the ability to show, possibly with 3D animation, at least one class of heavenly objects. The second consideration is that they are included in modern distributions, or at least can be installed or compiled from source with no (or very little) struggle, using current default compilers and libraries.

This second criterion excluded more than one potential contender: several programs, already quite good and full-featured some years ago, are still available, but development has stopped or slowed down a lot. The consequence is that today they don't

really get along with the latest Linux desktops. All the selected programs were installed and tested under Red Hat Linux 9.

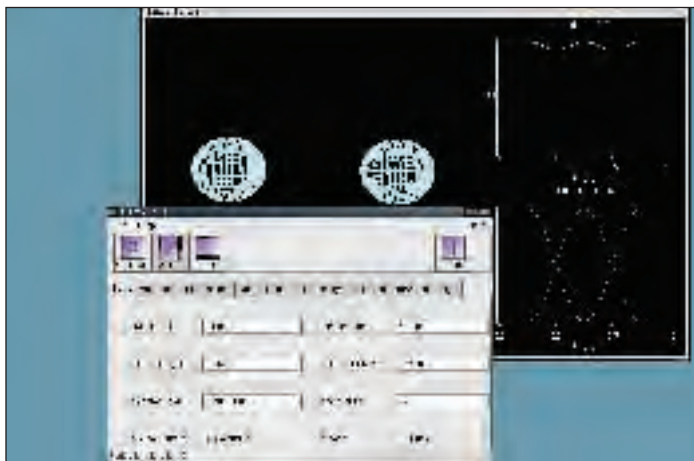
This *Roundup* is intended to examine the best programs for beginner astrophiles, possibly also usable by children. For this reason, the eight programs are presented in the following order: very specialised or very basic ones come first. Next you'll find more general-purpose planetarium tools, more-or-less suitable for (semi) professional work. Space travel simulators making use of OpenGL rendering close the show. All packages except *Xplns* are available under the GNU GPL.



# Nightfall

A virtual telescope for star twins.

■ **VERSION** 1.34 ■ **WEB** [www.lsw.uni-heidelberg.de/users/rwichman/Nightfall.html](http://www.lsw.uni-heidelberg.de/users/rwichman/Nightfall.html)



**Nightfall shows the ever-changing life and struggles of binary stars.**

The name of this program is a bit misleading: it's not a tool to show the sky after dark, more a powerful, interactive app for simulation and study of binary stars, and can generate

animations showing how these pairs of stars orbit around their common centre of gravity, possibly eclipsing each other.

*Nightfall* simulates each star using sophisticated physical models, which

take into account all main interactions between masses so big and close to each other. The primary interaction – gravity – is so powerful between binary stars that they are not spherical, but deformed by mutual attraction: *Nightfall* shows this very clearly. The tool also displays how light and radial speed of the two stars change over time: all visible in the screenshot.

If available, observation data can be loaded and processed to calculate which mathematical model fits them best. Actual data for several real binary stars are included in the distribution, together with a complete user manual.

All data can be plotted with *GnuPlot* or the *PGPLOT* graphics library (not GPL, but free for non-commercial use). The main parameters controlling the visual impact, starting from the viewing angle, can be changed interactively. Advanced options can manage systems characterised by asynchronous rotation, non-circular orbit and other anomalies.

*Nightfall* can be compiled with or without support for GNOME and OpenGL/MesaGL support. Strictly speaking, it could even be compiled without *GnuPlot* or *GTK+*. This seems to make interactive use as boring as can

be, but could also become a plus in some special cases, admittedly not likely to interest the casual user. We refer to the fact that a console-only *Nightfall* could be used to run batch analysis of huge quantities of data, or even be patched to work as a CGI script. To start it as shown in the screenshot the **-U** option (for "User interface") is needed. Another interesting feature is that the binary packages provided on the site can be relocated in non-standard directories, and work by setting (as specified in the docs) the NIGHTFALL\_DATAROOT environment variable. This is handy if the program is installed without root access, in the \$HOME directory, or one wants to test different versions in parallel.

## LINUX FORMAT VERDICT

<b>FEATURES</b>	<b>7/10</b>
<b>EASE OF USE</b>	<b>5/10</b>
<b>DOCUMENTATION</b>	<b>8/10</b>
<b>PERFORMANCE</b>	<b>7/10</b>

The animation is not photo-realistic, but very accurate, taking into account all physical interaction between the stars.

**RATING** **7/10**



# Starplot

The simplest 3D visualiser around

■ **VERSION** 0.92.3 ■ **WEB** [www.starplot.org](http://www.starplot.org)



**Mapping distance and directions can be difficult in space - which is why Star Trek uses a non-specific 'mark' system...**

Another specialised program, not meant for realistic, planetarium-like maps, its purpose is to generate, on any Unix platform, interactive charts

showing the relative 3-dimensional positions of stars in space.

The source code distribution also includes *starconvert*, a filter

transforming line-oriented stellar data records to *StarPlot* format. Stars' technical data is readily available from several windows. Nebulae and other non-stellar objects are supported.

The interface of *Starplot* is quite bare, but provides all the necessary info to astronomy students or beginners. The main view, even if different by design from the photograph-like screen offered by more popular programs, is agreeable and resembles *Star Trek* 3D displays!

The screenshot shows the main panel, complete with legends of stellar classes, and the magnitude of the selected stars in the sub-window placed in the bottom-left corner. Right-clicking any star pops up another small window containing its data. The viewing position can be changed coarsely via clicks, or given a precise value in dialog boxes.

Charts can be displayed with the celestial or galactic coordinate systems. The viewing parameters of currently selected charts can be saved to a file and reused in future sessions.

*Starplot* should install on any Unix platform equipped with *GTK2* and *g++*. Modern libraries and encodings, (*Pango* and *UTF-8*) are used to draw all kind of characters using system

fonts, making sure that once they are properly configured *Starplot* will not have problems like those we had with other apps in this roundup.

The home page lists as a known bug the fact that, if the user loads more than one star data file, the program doesn't check for duplicated stars. We had no occasion to verify this. However, during the test, *Starplot* froze when we accidentally pressed two different buttons one right after the other.

Another disadvantage of *Starplot* is the docs: HTML pages contain a useful chapter explaining space coordinate systems and basic general concepts like spectral star classes and magnitudes, but nothing about the program itself.

## LINUX FORMAT VERDICT

<b>FEATURES</b>	<b>5/10</b>
<b>EASE OF USE</b>	<b>6/10</b>
<b>DOCUMENTATION</b>	<b>7/10</b>
<b>PERFORMANCE</b>	<b>6/10</b>

Not designed for realism, but can give a quick idea of how heavenly objects are placed in the tri-dimensional space.

**RATING** **6/10**

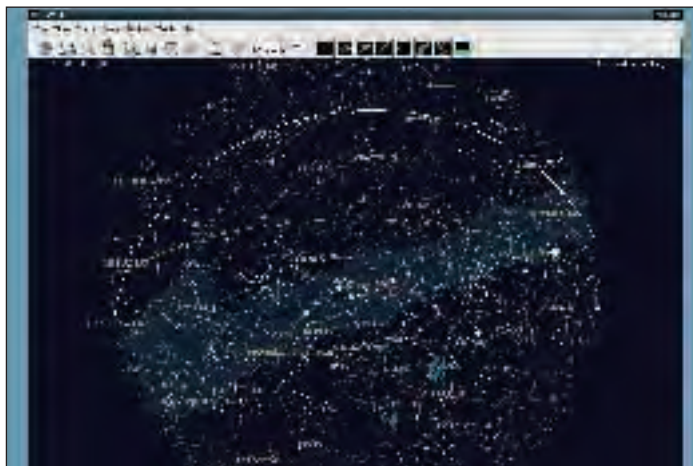


## ROUNDUP Astronomy Programs

# Kstars

The default planetarium for KDE users.

■ **VERSION** 0.9.1 ■ **WEB** <http://edu.kde.org/kstars/>



Astronomy the KDE way.

**KStars gives an accurate graphical** simulation of the night sky from any location on Earth, at any date and time, which can be panned and zoomed; and identify and track objects. The tested version includes 40,000 stars, 13,000 deep-sky objects, all eight planets, the

Sun and Moon, and thousands of comets and asteroids.

The interface is as refined as in usual KDE apps. The time-step field in the toolbar chooses the simulation speed. Several buttons control with one click the display of different objects. The

names of the ones currently selected are written in the bottom bar, together with the sky coordinates corresponding to the position of the cursor. The star display is one of the most accurate in the 2D graphics category: compare this visualisation of the Milky Way to that shown in other screenshots here. The star maps can be printed for any use.

The online manual, quite complete, includes the interesting *Astroinfo* project. Currently this is only a small set of articles explaining astronomical concepts to beginners, but is supposed to become nothing less than "an interactive encyclopedia of astronomy for which *Kstars* will be the user interface and demo engine". *Astroinfo* even has its own mailing list, [kstars-info@lists.sourceforge.net](mailto:kstars-info@lists.sourceforge.net).

The tested version is the one included in Red Hat 9. It has a noticeable start up time, especially if KDE is not already running, but it is satisfactorily fast when loaded. This comes at the expense of realistic animation: when the point of view changes, usually while the user presses the arrow keys, the program stops recalculating object positions to save CPU cycles. Luckily the types of objects to show while moving are user defineable: each user can then find the

best compromise between visual realism and speed.

A new version of *Kstars* for KDE 3.2 was under active development as of mid-November 2003. It was not possible to test it under Red Hat 9, since this distro shipped with KDE 3.1, but it should be included, or installable without any problem, in any new distribution available in the first half of 2004. The main novelty is expected to be fully-integrated telescope control (even remotely, through the Internet) through the Instrument Neutral Distributed Interface <http://indi.sourceforge.net/>. Another welcome addition will be a 300 per cent increase in the number of stars. The new *Kstars* will also have the same AAVSO interface that is already present in *Xephem*.

### LINUX FORMAT VERDICT

<b>FEATURES</b>	<b>8/10</b>
<b>EASE OF USE</b>	<b>9/10</b>
<b>DOCUMENTATION</b>	<b>7/10</b>
<b>PERFORMANCE</b>	<b>8/10</b>

*Kstars*, already mature and rich in features, is also one of the most pleasant programs to look at and use.

**RATING** **8/10**



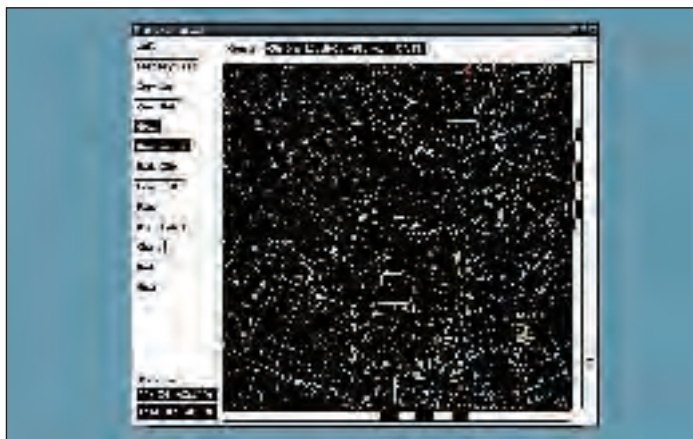
# Xsky

A simple planetary charter for low-end systems.

■ **VERSION** 3.0.4 ■ **WEB** <http://asds.stsci.edu/packages/utilities/XSKY.html>

**This is an interactive sky chart** generator for the X Window System last updated in 1996. It still compiles thanks to exclusively using the Athena widgets

and the X toolkit directly – future-proof, if not up-to-date with current aesthetic standards: we had to discard other candidates to this roundup, much more



*Xsky* remains a fast planetarium program adequate for basic use.

recent than *Xsky*, because they would work only on one version of KDE, or with less-known widget sets. Sky charts can be saved in PostScript format and printed, but are the most rough seen in this roundup. The relative size of stars (full circles) corresponds to their magnitude, and the colour to their spectral class. Constellation boundaries can be drawn like in other programs (not shown in screenshot). Non-stellar objects can be recognised by their shape: quasars are empty circles, galaxies are elliptical, nebulae are boxes. Select objects by clicking 'Find', and entering its name or coordinates. Once found, objects can be given user-defined labels. Scroll bars, and mouse clicks change the point of view.

Most of the traditional X command-line options to set geometry and so on work in the usual way. The exception is fonts, because *Xsky* pretends to pick its own fonts for all text strings, both in the GUI and in the actual display. This created some problems during the test, since the program, although compiling nicely, would crash complaining that no fonts were found. Eventually we had to

give to it command-line options after checking in the font server settings. The fonts in the screenshot come from: `xsky -a lucidasans-10 -f lucidasans-10`. The initial setup is not easy. Shell-specific scripts must be sourced: the distribution provides one for *csh* and another for the Bourne shell. Three stars catalogs (for bright stars, non-stellar and quasi-stellar objects) are included, but *Xsky* can read several others. The web page says read the included SUMMARY file to have a detailed overview of the app, but we did not find it in the current tarball.

### LINUX FORMAT VERDICT

<b>FEATURES</b>	<b>5/10</b>
<b>EASE OF USE</b>	<b>5/10</b>
<b>DOCUMENTATION</b>	<b>0/10</b>
<b>PERFORMANCE</b>	<b>8/10</b>

*Xsky* is not as nice as its competitors, but would be improved greatly with some documentation that actually tells users how to operate it!

**RATING** **5/10**

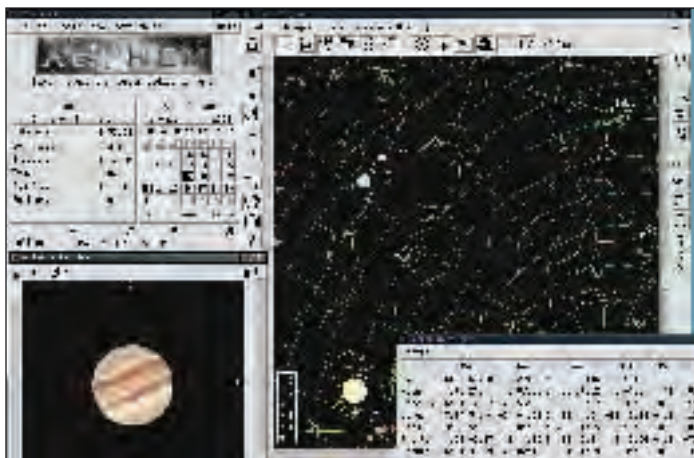




# Xephem

A veteran still fully equipped for real serious work.

■ **VERSION** 3.5.2 ■ **WEB** [www.clearskyinstitute.com/xephem/xephem.html](http://www.clearskyinstitute.com/xephem/xephem.html)



Planets, constellations and all the calculations that you'll need: *Xephem* remains a reliable and competent companion for serious astrophiles.

One of the oldest astronomy apps for Unix-like platforms still actively developed, it also runs on Apple OS X, Solaris and FreeBSD. The interface is less modern and sleek than programs based on recent toolkits, but serious

feature abound. *Xephem* has built in support for all planets, a lot of Solar System satellites and planetary objects like Jupiter's Great Red Spot. The user can define new objects, from man made satellites to asteroids. Comet

trajectories through the Solar System can be displayed in 3D stereo views.

The program can download data from several astronomical sites and display them according to user requests. These data range from satellite and asteroid trajectories to the variable star light curves continuously updated by the American Association of Variable Star Observers, AAVSO ([www.aavso.org](http://www.aavso.org)). The light curves window lets the user choose a variable light star, downloads its data from the AAVSO site and then plots a diagram showing how the light of that star changed in the chosen time interval. Other Net connections are used to build planispheres with real-time cloud cover, land and sea surface temperature and satellite ground tracks.

*Xephem* can directly control several telescopes, and understands the log files produced by SETI@home clients. The 'Sky Point' function of the SETI sub-window, for example, centres the display at the position of the SETI work unit currently being processed.

Other data processing utilities embedded in *Xephem* are a spreadsheet for coordinate conversion and a calculator to solve user-defined equations with catalog data. PostScript output is obviously supported.

One last nifty feature is the "Night at

a glance" function, which shows immediately when planets and other objects are above the horizon in any user defined location, for a 24 hour period.

The user interface is unusual but smart: notice how several commands are organised along the borders of the star chart window: 'What' buttons on top, 'Where' buttons on the right, 'How' buttons on the left. *Xephem* uses *Open Motif*. Both the runtime and developer packages of this toolkit must be installed to build and run the program.

The downloadable distro includes several large sky databases. To get really serious (and support the developers!) users can purchase a US\$59.95 CD-ROM with extra databases, counting about 70 million stars and many thousands of other objects.

## LINUX FORMAT VERDICT

<b>FEATURES</b>	<b>9/10</b>
<b>EASE OF USE</b>	<b>7/10</b>
<b>DOCUMENTATION</b>	<b>8/10</b>
<b>PERFORMANCE</b>	<b>8/10</b>

If you're at all serious about using this, it's certainly worth forking out for the wealth of extra data in the full version.

**RATING** **8/10**



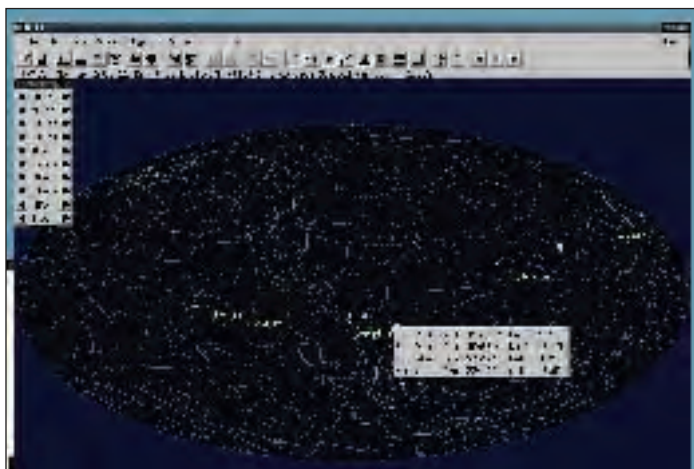
# XPLNS

Simple-to-use planetarium tool with a nice GUI.

■ **VERSION** 3.3.1 Rel.1 ■ **WEB** [www.astroarts.com/products/xplns/](http://www.astroarts.com/products/xplns/)

*Xplns* has a spartan look and some serious features for the not-so-casual star enthusiast. 3.3.1 calculates and

displays quickly and accurately the position of objects from stars to comets. The motion of an object can be followed



The speedy default settings produce uncrowded, readable star charts.

by tracking it, and fourteen different projection modes are supported. The sliding cursor at the bottom of windows lets the user rotate the point of view: even on low-end machines *Xplns* redraws the screen following the cursor without any lag. Even real-time motion is supported, together with jumps back and forth in time (via the panel shown on the left of the screenshot). One thing to keep in mind is that *Xplns*, even if fast, won't start if X runs with 256 or less colours. This can be a problem when planning to use this software on systems with limited graphic cards.

A nice-looking feature of *Xplns*, even if it might be limited to explain Earth rotation to students, is the so called "Diurnal motion view". The program can display star charts, centred on the Polar Star, with all other stars describing arcs of circles around it.

Due to the inclusion of proprietary code, *Xplns* is free of charge but distributed only in binary form. Aside from license issues, this is obviously a problem if the provided packages don't work on some less than common combination of kernel, *glibc*

and XFree. At the time of this writing, the developers provided separate binaries for *glibc* versions 2.1, 2.2 and 2.3. They installed without problems on Red Hat 9, but pushing some toolbar buttons while the program was redrawing the chart froze it, and we had to kill it from the command-line.

On the test system, *without* command line options, *Xplns* tried to start in Japanese and aborted, since the needed fonts were not available. English, French and Dutch are also available: they can be selected from within the program (choose Settings> Environment) or from the command line:

```
% xplns --lang=en
```

## LINUX FORMAT VERDICT

<b>FEATURES</b>	<b>7/10</b>
<b>EASE OF USE</b>	<b>7/10</b>
<b>DOCUMENTATION</b>	<b>7/10</b>
<b>PERFORMANCE</b>	<b>8/10</b>

With a bit more polish, this could even be the winner of this selection.

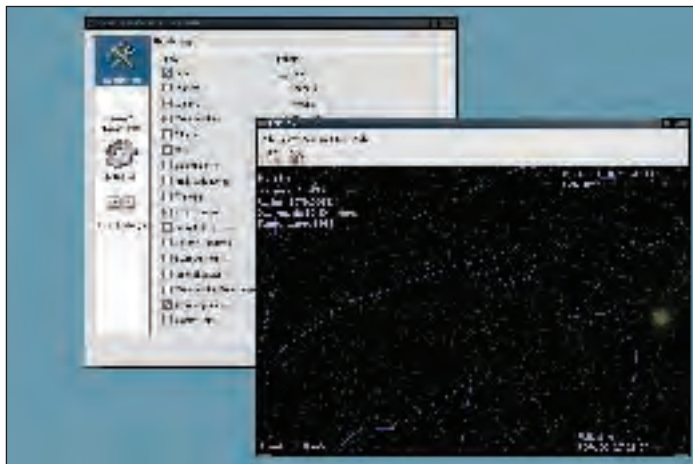
**RATING** **7/10**



# Celestia

An extensible space flight simulator.

■ **VERSION** 1.3.0 ■ **WEB** [www.shatters.net/celestia/](http://www.shatters.net/celestia/)



Preparing for a space flight: *Celestia* can go from basic planetarium mode to warp-speed interstellar travel.

This is a real-time 3D space flight simulation tool not confined to the surface of the Earth. It is possible to simulate travels through the universe, as long as the catalogs contain the relevant

items. The default maps include the solar system, more than 100,000 stars, and a lot of other objects. A complete manual is available, both online and in PDF format. If your hardware is powerful

enough (at least 32 MB of RAM, fully supported by your Linux distribution, and the corresponding Mesa/OpenGL libraries), zooming is smooth, scaling without hitches from interstellar scenarios to much smaller ones. On more limited systems *Celestia* will run slowly, and may miss at all some 3D animation features. Building from source requires several development packages from KDE and Mesa/OpenGL, not just the runtime ones.

The 'spaceship' mode is highly entertaining. Simulating an interstellar fly is as simple as selecting the destination and clicking the Goto button. Predictably, the arrow keys can be used to change direction. Holding down the **A** key starts spaceship moving, at speed exponentially increasing up to a 'hyperspeed billions of times faster than light'.

The program can show unrelated views from different positions (for example Earth from the moon, or the Sun from Mercury) simultaneously. The manual suggests this mode for eclipses, but planetary alignments are also good candidates for this feature.

*Celestia* also supports users scripts, and is built to be extended with third-party items: a guide on how to write

them is available on the website. Any kind of astronomical object – be it real or made-up – can be added to the database in this way. The available add-ons include objects as diverse as the unnamed moons of giant planets to Mars spaceships orbits.

Another nifty feature in version 1.3 is the possibility to save and share the so-called **cel://URLs**. They are strings containing all current settings (camera location, orientation, etc) which can be pasted in web pages and similar. Clicking on them other *Celestia* users will start their program from the same position.

There's also an active *Celestia* community: a forum and several pages with a lot of scripts and contributed objects are all reachable on the web.

## LINUX FORMAT VERDICT

<b>FEATURES</b>	<b>9/10</b>
<b>EASE OF USE</b>	<b>8/10</b>
<b>DOCUMENTATION</b>	<b>9/10</b>
<b>PERFORMANCE</b>	<b>8/10</b>

For a generation of users who cut their space-faring teeth on *Elite*, this is Astro-simulation at its finest!

**RATING** **9/10**



# Stellarium

One of the most realistic sky drawing apps available.

■ **VERSION** 0.5.1 ■ **WEB** <http://stellarium.free.fr>

A very nice looking planetarium app built with OpenGL for real-time 3D photo-realistic skies, available for Windows 95 to XP, Linux/Unix and Mac OS X: ideal to get familiar with

heavenly objects and for observation events rather than scientific accuracy. *Stellarium* renders atmospheric effects like fog and diffraction, requiring:

■ A 3D Card with a support for



Turn off any lights near your computer to get the full twinkle, twinkle...

OpenGL. At least a Voodoo3 or a TNT2 is recommended.

■ A dark room for realistic rendering: details like Milky Way or star twinkling can't be seen in a bright room.

With adequate hardware, stars do twinkle, and zoom is fast and smooth. Full screen mode further increase realism. The Milky Way looks just as one would see it through a binocular or telescope at the same zoom level. The user interface is a bit on the light side, but adequate. As in other apps, selecting an object (see screenshot) pops up a window listing its main characteristics.

The included database contains more than 120,000 stars and several deep sky objects. Landscape contours (visible in the bottom part of the screenshot) can be defined by the user. The speed of animation can be set to real time or accelerated. An important feature \_not\_ present in *Stellarium* is a sky object search engine. This is a bit upsetting, even if coherent with the declared goals of the package: just show accurately what is up there, rather than finding and tracking things.

The next version of *Stellarium*, which may be already available by the time you

read this, should display Sun eclipses and Jupiter satellites. The most evident addition however should be the support for fish-eye mode: 360 degree field of view just like in a real planetarium or outdoor, with landscape lines drawn accordingly all around the sky map.

*Stellarium* is a very appealing tool with great potential, but development and contributions are slower than in other programs. This is simply due to the fact that the user community is smaller, and that *Stellarium* is a one-man project: kudos to Fabien Chéreau for his software. C++ programmers are welcome to join, to speed things up!

## LINUX FORMAT VERDICT

<b>FEATURES</b>	<b>7/10</b>
<b>EASE OF USE</b>	<b>7/10</b>
<b>VALUE FOR MONEY</b>	<b>8/10</b>
<b>PERFORMANCE</b>	<b>9/10</b>

*Stellarium* may not be as accurate as its competitors, but it does look as a window open on the real sky.

**RATING** **8/10**

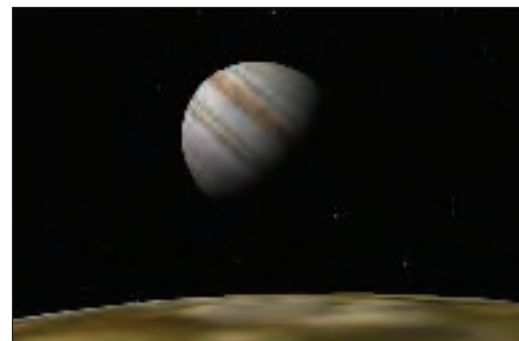
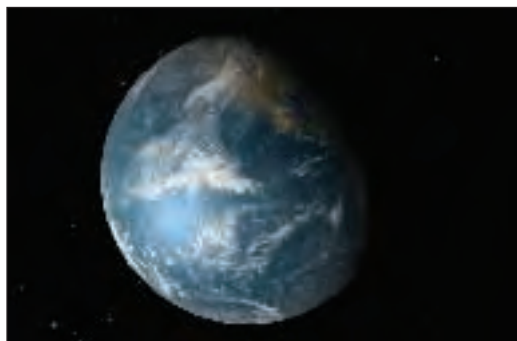




# ASTRONOMY APPS THE VERDICT

**C**elestia gets the first place in this roundup because it offers the best compromise of the features declared as target: rich functionality, easy installation and configuration, fun to use for beginners. This package integrates planetarium and advanced space-flight simulation functions with good documentation, and an active user community. On top of that, it is also easily extensible.

When 2D sky visualisation is enough, but integration with the desktop and little setup effort is important, *Kstars* is the way to go. It blends in perfectly with KDE, is a pleasure for the eyes, and is usually bundled with a lot of other well-written educational software (see <http://edu.kde.org>). *Xephem* remains the preferred solution for advanced hobbyists. *Stellarium*, as already mentioned, may become a very



Some of the amazing spacescapes in *Stellarium*.



serious competitor of *Celestia* if it had more developer manpower.

There is an important factor to consider when deciding which planetarium software is best suited to one's goals and style: this kind of activity inherently requires a *lot* of RAM and CPU cycles, regardless of the program. The memory use figures reported in the table below are those measured right after startup, with the program just sitting there waiting for user input: they should really be considered just as a very rough starting point. If you need an OpenGL advanced simulator like

*Celestia* or *Stellarium*, don't even start to measure RAM until you are sure to have a good 3D graphics adapter with a proper Linux driver.

In this field, the great majority of the required RAM and disk space is occupied by catalog data, not by the program itself. The 32MB used by *KStars*, for example, seemed entirely due to the fact that this application starts slowly to load the whole catalog *before* the user steps in, to be faster during later usage. A program may be quicker simply because it is displaying a much smaller number of stars, not

because it is coded better. With astronomy tools, finding the more responsive package depends even more than usual by what exactly the user wants to do and how.

The reviewed programs are only the top of one of the many faces of the 'astronomy with Linux' world... er, galaxy? To have a real idea of all that is possible the best place to go is [www.randomfactory.com/lfa/intro.html](http://www.randomfactory.com/lfa/intro.html): you'll find a compilation of several gigabytes of precompiled Linux astronomical software for your entertainment and education. **LXF**

## ASTRONOMY APPLICATIONS: TABLE OF COMPARISON

**Note:** source packages sizes and memory stats below are approximate. Memory usage varies from system to system, and is affected by the program's configuration and other factors.

NAME	TOOLKIT	SOURCE PACKAGE SIZE	STARTUP MEMORY USE	CONFIGURABILITY	ALTERNATIVES
<i>Celestia</i>	Qt	16MB	20MB	high	<i>Stellarium</i>
<i>KStars</i>	Qt	12MB	32MB	high	<i>Xephem</i> , <i>Xplns</i>
<i>Nightfall</i>	GTK	1MB	12MB	medium	N/A
<i>Starplot</i>	GTK	150KB	3.2MB	low	N/A
<i>Stellarium</i>	OpenGL	3.1MB	16MB	low	<i>Celestia</i>
<i>Xsky</i>	Athena	1MB	3.2MB	medium	<i>Xephem</i> , <i>Xplns</i>
<i>Xephem</i>	GTK	2.5MB	5MB	high	<i>XSky</i> , <i>Xplns</i>
<i>Xplns</i>	N/A	1.2MB	4MB	medium	<i>Xephem</i> , <i>Xsky</i>

# Hottest Picks



The best new Open Source software on the planet!



**Mike Saunders**

A coder since Amiga times, Mike's a Linux and BSD guru.

This is the place where we get to profile some of the hottest software around.

Each month we trawl through the hundreds of open source projects which are released or updated, and select the newest, most inventive and best for your perusal. Most of the Hot Picks are available on our coverdiscs, but we've provided web links if you want to make sure you have the very latest version.

If you have any suggestions for things that we should cover, please email us at [linuxformat@futurenet.co.uk](mailto:linuxformat@futurenet.co.uk)

**H**ot Picks has been a regular section of *Linux Format* right from issue one, and we've looked at stacks of top-quality new and upcoming applications. Many have matured into popular and widely-used programs, others have provided alternatives to the more established software, and a few have faded away into obscurity. It's fascinating to look back over the last four years and see how many of the programs that we take for granted today looked in their embryonic stages; early feature-lacking and bug-prone releases have battled through to reliable and flexible applications.

Thanks to the suggestions of you, our readers, we've been able to cover all aspects of Linux software – desktop utilities, programming tools, server apps, games and more besides. And as a slight departure from the normal *Hot Picks* format, this month we're looking back at some of the choices in past issues and looking forward at a bunch of the most intriguing applications which deserve more coverage. We've compiled a list with 50 of the most useful and promising Linux programs in several



**DVD readers are treated to 330 programs from every *Hot Picks* ever!**

categories, and best of all they're on the coverdiscs – you can give them a spin straight away! CD readers get the full 50 Hottest Picks listed below that we've somehow managed to squeeze onto 3 CDs, and DVD readers get a truly awesome collection of *Hot Picks* software: the latest version of *every single title* we've featured since *LXF01*!

With such a gargantuan range of top-notch Open Source software available, and thousands of projects in

heavy development, our 50 selections are bound to stir up some debate; if you think we've made a controversial choice, then the Magazine forum on our website is open for lively discussion. Still, every application in its field here is definitely worth trying, and as many of them have been featured elsewhere in the mag in recent times (Roundups, Tutorials and standalone reviews etc) so here we're examining a few of the lesser-known tools too.

## 50 issues of *Linux Format Hot Picks* – The Hottest 50

Firebird 0.7	Superb Gecko-based browser from the Mozilla crew
MPlayer 1.0pre2	Immensely versatile media player – vast format support
Fluxbox 0.114	Small, fast and slick Blackbox-derived window manager
WINE 20031118	Maturing Microsoft Windows OS emulation layer
Bochs 2.0.2	Competently emulates a full x86 PC system
XFce 4.0.1	Attractive and lightweight desktop alternative to KDE/GNOME
SoundTracker 0.6.6	Well-crafted GTK-based music tracker (MOD)
XMMS 1.2.8	Crisp Winamp-esque music player (MP3, Ogg and more)
Kopete 0.8beta1	Lovely well-designed KDE instant messaging client
GAIM 0.74	GTK IM client, supporting heaps of different protocols
DOSBox 0.6.0	Like Bochs, but concentrates solely on emulating MS-DOS
ReZound 0.9.0	Graphical audio file editor crammed with goodies
X-Chat 2.0.6	First-rate and flexible IRC chat client built around GTK
Thunderbird 0.3	Featureful, lighter standalone Mozilla mail component
Pan 0.14.2.90	The best graphical newsgroup reader for Linux
Quanta 3.2 BE 1	Polished web site development tool built on KDE
Apollon 0.9.1	Multi-protocol peer-2-peer network prog for KDE
gPhoto/gtkam 2.1.3	Digital camera suite, supports loads of models
GnuCash 1.8.8	Popular money-managing accounting app using GTK
Planner 0.11	GNOME project planning, scheduling and tracking (formerly called MrProject)

### OFFICE

OpenOffice.org 1.1	Bulky but very powerful MS-compatible office suite
AbiWord 2.0.1	Svelte and clean multi-platform word processor
KOffice 1.2.94	KDE's collection of smart little office tools
Gnumeric 1.2.2	Well-developed spreadsheet app, part of GNOME-Office
KILE 1.6	A full-featured LaTeX editing program for KDE
Scribus 1.1.3	Highly promising Qt-based publishing program
Kroupware 1.0.1	Groupware system built around KDE's Kolab and KMail

### DEVELOPMENT

Anjuta 1.1.98	Smooth GTK-driven integrated coders' development suite
ManEdit 0.5.10	Definitely the most pleasant way to create manual pages
gPHPEdit 0.4.3	Sweet and nicely-designed GNOME 2 PHP/HTML/CSS editor
KDevelop 3.0.0B	Brilliant KDE IDE supporting a plethora of langs
NEdit 5.3	Small and Efficient multi-purpose coders' editor
Eclipse 3.0M5	Another solid and well-received claim to the IDE throne

### SERVER

Postfix 2.0.16	Massively popular and robust mail transfer agent
Apache 2.0.48	Without doubt best and most used all-round web server
Exim 4.24	Another successful alternative to Sendmail MTA
Samba 3.0.0	Absolute godsend for UNIX-Windows integration
OpenSSH 3.7.1p2	The de facto standard for remote administration
Nessus 2.0.9	Detailed and thorough security checker
Cherokee 0.4.6	Small, clean and fast alternative to Apache
MySQL 4.0.16	Open source database in very common use
PostgreSQL 7.4	Excellent MySQL rival in the database race
Ethereal 0.9.16	Powerful network analysis and scanning tool
ProFTPD 1.2.9	Regarded by many as the best FTP server bar none
KMyFirewall 0.9.6.1	Comfortable UI for setting up iptables firewall

### ENTERTAINMENT

Frozen Bubble 1.0.0	It's Bust a Move... but on Linux and Open Source
ZSNES 1.36	Near-perfect Super NES emulation to relive old times
Pathological 11.3	Pleasingly presented, polished puzzler
Freeciv 1.14.0	Decently done Open source Civilization clone
BZFlag 1.7g2	Online 3D tank shenanigans and blasting fun ahoy!



## DIGITAL CAMERA UTILITIES

## gPhoto/gtkam

■ VERSION 0.4.3/21.3/0.110 ■ WEB [www.gphoto.org/](http://www.gphoto.org/)

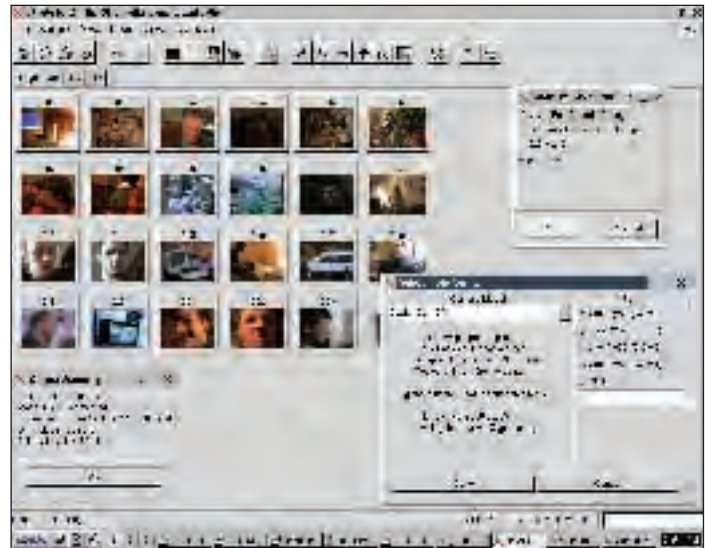
Apple's Mac platform has been the primary domain for professional artists and photographers in recent years, and as a result support under Linux for digital cameras has been somewhat sketchy. Similarly, the lower-end devices tend to be bundled with dodgy Windows drivers, once again leaving Open Source fans in the cold. We haven't looked at *gPhoto* much in *LXF*, but it has done a sterling job of improving the situation, so it's worthy of inclusion here.

The *gPhoto* software base is a little complex at present; most distros are supplied with the *gPhoto2* command-line binary and supporting *libgphoto* library, along with a graphical *gtkam* tool for viewing. Also in common use is the original *gPhoto*, which has a more developed interface and works better

with some older cameras. With *gPhoto2*'s components more distinctly separated, it's hoped that other apps (eg *Nautilus*) can make full use of its range of capabilities.

From the command-line, *gPhoto2* can be used to grab images and videos from a device, but for hands-on operation *gtkam* is a better choice. Its sparse UI allows for basic image browsing and camera configuration – impressively, over 400 models are supported at present (some better than others) including just about all household name brands such as Agfa, Canon, Kodak, Nikon and Olympus.

Still, it's not perfect. While *gPhoto2/gtkam* had no troubles with a modern Canon unit, it fell to pieces dealing with an old Casio device (support marked as 'Experimental',



The original *gPhoto* has more features and better support for old cameras.

admittedly). However, the original *gPhoto* (0.4.3) handled it fine, and has a better interface with more features for manipulating images, so it's definitely best if you keep both programs at hand.

All in all, *gtkam* as an application is pretty limited; the developers describe it as a reference implementation of a

*libgphoto* tool and the original is better on the feature front. Yet it does the job, and most importantly the fantastic work by the coders on supporting so many models should be applauded. Their work is invaluable to snap-happy Linux-using photographers, and provides the foundation for other image programs like *Kamera* and co.

## WEB BROWSER AND MAIL CLIENT

## Firebird/Thunderbird

■ VERSION 0.7 (FB) and 0.3 (TB) ■ WEB [www.mozilla.org/](http://www.mozilla.org/)

When Mozilla was launched, one very valid criticism directed at the project was its bloat – all the XUL and abstraction resulted in a thick, bulky

wrapper round the relatively speedy *Gecko* HTML rendering core. As a result, *Firebird* (né *Phoenix*) was born as a standalone browser to combat the

slowness problems, and did well; in a similar way, *Thunderbird* (*Minotaur*) appeared to provide the mail/news client component as a single program too. While not orders of magnitude faster, they became noticeably faster and smaller than the old *Seamonkey* builds.

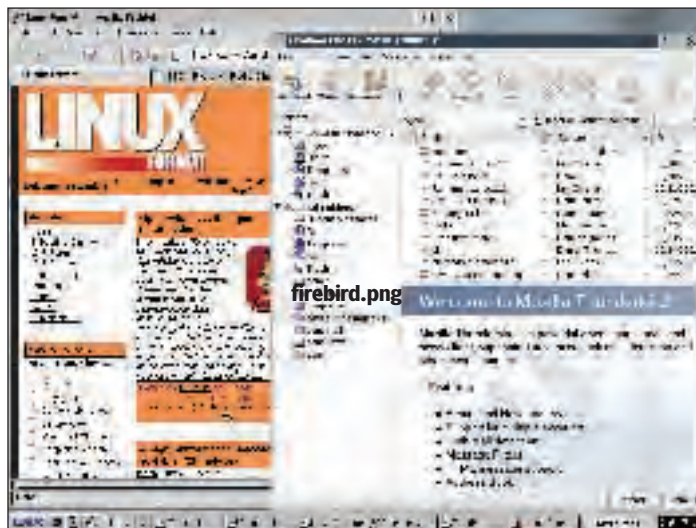
*LXF* covered *Firebird* not too long ago, but its fast development pace and importance on the Linux desktop merits it with another look. Equally, *Thunderbird* has paced forward competently and is showing a great deal of potential. We're looking at an early-December nightly build of *Firebird* here – this should be similar to release 0.8 as you read this. And unless you fancy a few command-line somersaults, it's best to stick with the pre-built binaries.

The most notable new feature since *Firebird* 0.7 is a DOM Inspector window for examining the makeup of a document, accessible from the Tools menu. Work on a proper installer has

begun (Windows-only at present), while the Preferences box has had a few clean-ups, there's a new Download Manager, and a 'First Run' wizard-type box and extensive UI polish are planned for the near future. It's just a tiny bit faster too!

Meanwhile, *Thunderbird* 0.3 has seen plenty of work since our last *Hot Picks* coverage. Alongside a new *Qute* theme – bringing it in line with *Firebird* – there have also been improvements to the spelling checker, Options window and lots of tweaks to boost performance. It's clearly usable as a day-to-day mailer now.

Both apps are marching along to 1.0 releases with armies of fans behind them, and they work superbly as desktop-independent Internet apps. With a bit more spit-shine and work on the running speed, they'll be undeniably significant in Linux's future on the desktop. A brilliant duo.



*Firebird* and *Thunderbird* in action – note the new *Qute* theme for the latter.

## PROJECT MANAGEMENT

## Planner

■ **VERSION** 0.10 ■ **WEB** <http://planner.imendio.org/>

Along with email clients, web browsers and office suites, project management tools are becoming ubiquitous in the workplace. Being able to organise resources, generate plans and have a clear overall view of a project's direction is vitally important in a competitive business – a few slip-ups or misjudgments could lead to delays and lost cash. Microsoft has been successful with its (imaginatively titled) *Project*, part of the *MS Office* compendium, and now CodeFactory AB, in collaboration with the GNOME community, brings us *Planner*.

The name that regular readers will recognise for this application was in fact *MrProject*. As we went to press with this, our 50th issue, it was announced at the eleventh hour that the name of the program has been changed to *Planner* – sorry for any confusion!

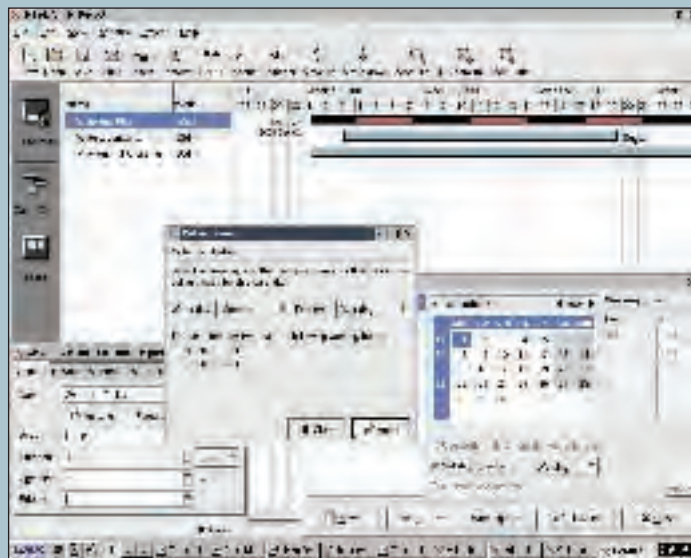
As *Planner* is a component of the GNOME desktop (and specifically *GNOME-Office*) it's most likely to be

included with your distro (probably as *MrProject*). Failing that, the source tarballs from our coverdisc are available for building it – you'll need recent GTK and GNOME libraries along with their relevant development headers and so forth, and you'll have to compile both the app and its supporting library (*libplanner*).

With a cleanly laid-out interface, *Planner* gives a good initial impression

of professional and smart program – perhaps not as many twiddly buttons as some 'Pointy Haired Bosses' would like, but good all the same. The left pane gives quick access to the three main views: Resources, which can be applied to individual tasks, Gantt Chart, for a graphical indication of progress, and Tasks (in which dates and costs can be managed). It's all very neat and usable. To simplify matters, resources can be assigned to Groups while completed tasks can be toggled to Milestones and represented as such on the chart. Text notes can be added to individual tasks, calendars can have exact working times set, and the whole kaboodle is saved as an XML dialect (or exported to an SQL DB). There's an HTML export function too thrown in for good measure.

Overall, *Planner* may not yet be as feature-packed as MS's offering but it's simple to use and not overloaded with distractions. The coders have some interesting and regularly requested goodies planned for the future – a full calendar implementation and possible *MS Project* export filter – but for now it's still an accomplished string on Linux's corporate desktop bow.

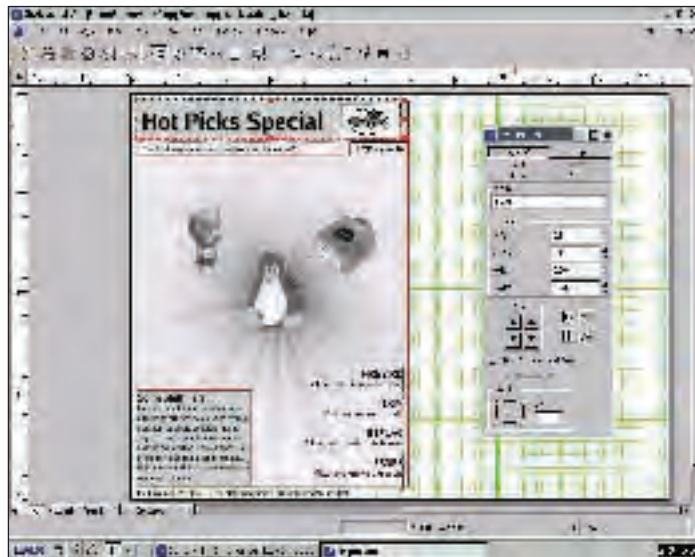


Not the most rivetting project ever, but demonstrates the app's capability.

## PUBLISHING TOOL

## Scribus

■ **VERSION** 1.1.3 ■ **WEB** [www.scribus.org.uk/](http://www.scribus.org.uk/)



Scribus is getting faster and more reliable with each release – top stuff!

Not too long ago in LXF (issue 45 to be exact) we looked at *Scribus 1.0*, the project's first stable release, in a standalone review. Andy Channelle summed it up with "Very usable if your needs are modest... It has the potential to go onto great things," and totally right he was too. Five months on, a huge amount of development effort has been put into *Scribus* – overhauls, rewrites and other additions too. Here we're looking at 1.1.3, which is a developer release heading towards a new stable branch.

You'll need to compile *Scribus* from source as no binaries are yet available, but with the right components in place it should build without too much hoop-jumping. The developers recommend Qt 3.2.3 and GCC 3.2.x for maximum stability; other versions may work but could also throw up glitches and crashes. Then goes the typical `./configure && make && make install` routine.

*Scribus'* most immediately apparent change in the development branch is its slick new splash screen. Otherwise, few alterations have been made to the

UI; the layout is still tidy and sports the ever-useful redefinable keybindings. Version 1.1.2 saw a large performance patch slotted in, and the results are clearly evident: scrolling, zooming and reflow of text boxes is snappier. Hurrah.

Other improvements include a rewrite of the font subsystem (now uses *Freetype* rather than *Qt* to get font info), a story editor for more efficient text editing, built-in Python scripting and a plethora of other touches and fixes. Font changes aside, it has no problem opening native XML files from the 1.0 release, and the top-notch PDF export (and preview) tool still works as well as ever.

We're hugely impressed by *Scribus'* progress since 1.0, growing steadily into the DTP app of choice for Linux systems. Not quite a *QuarkXPress 4.0* killer – we can't expect that yet – but considering the number of media companies ditching *QuarkXPress* in favour of *Adobe InDesign*, *Scribus* has the potential to be a future market number two, especially if it's eventually incorporated into *OpenOffice.org*.



## INTEGRATED DEVELOPMENT ENVIRONMENT

## Anjuta

■ VERSION 1.1.98 ■ WEB <http://anjuta.sourceforge.net/>

Anjuta's silky GTK2 editing window with the initial-start dialog.

## When we chose KDE's masterly

*KDevelop* tool as the best IDE in LXF35's *Roundup*, one developer went straight onto a KDE forum and congratulated the team for their work. He accepted that there were weaknesses to improve upon, and reviewer Mo Kelly's summary that there were 'rough edges' was spot-on. Since then, the *Anjuta* crew has been working hard on a GNOME 2 version – it's also becoming a favourite of coders the world over, and so we're looking at its progress here. The RPM supplied on our coverdisc should work with Red Hat 9 and other recent RPM-based distros (including Fedora Core 1); if not, compiling from the source will be hassle-free providing you have all the necessary libraries and devel packages installed.

*Anjuta* doesn't start up particularly quickly, but the slick splash screen and Application Wizard give a positive impression. The Wizard offers a number of project types – console app, vanilla X program or full *GTK* project – and goes on to create all the usual paraphernalia. With tooltipped toolbars

and a three-pane setup making up the window furniture, *Anjuta* abides by the usual IDE conventions and the syntax-highlighting *Scintilla* editor component is notably good.

Supporting solid integration with the standard GNU toolchain, a robust *gdb*-based debugging subsystem and various CVS operations, *Anjuta* does a respectable job and the ability to take an existing project tree and *Anjuta*-ise it is a sound addition. New since 1.0 is a rework of the thorough Prefs box, an external tools configuration dialog, wider language support and oodles of other improvements and fixes.

We still suffered the odd crash in use, and certain aspects of the app could do with a bit more polish, but otherwise it's moving along well; it's not quite as featureful as *KDevelop* yet but that will come with time and more developers. Nonetheless, *Anjuta* provides a friendly and easy-going tool for starting a programming project (or indeed managing a current one in a more coherent environment), especially if you want to develop for the GNOME desktop.

## PROGRAMMER'S EDITOR

## NEdit

■ VERSION 5.3 ■ WEB [www.nedit.org/](http://www.nedit.org/)

Programming tools vary so widely for different projects with different goals using different languages. One essential ingredient in a productive coding session, though, is the editor – being the hands-on app for navigating and managing source code, the title of best editor is fiercely disputed (see the perennial *Emacs* vs *Vi* wars, which seem to show little sign of abating, despite the fact that there are lots of editors available these days). Equally, some programmers prefer a fully-fledged development environment like *Anjuta* whereas others feel happier in a standalone program, adhering to the UNIX philosophy of 'small, simple tools working together'.

*NEdit* is one of the most popular and long-standing text editors, and its maturity and featureset deserve some coverage in this *Hottest Picks*

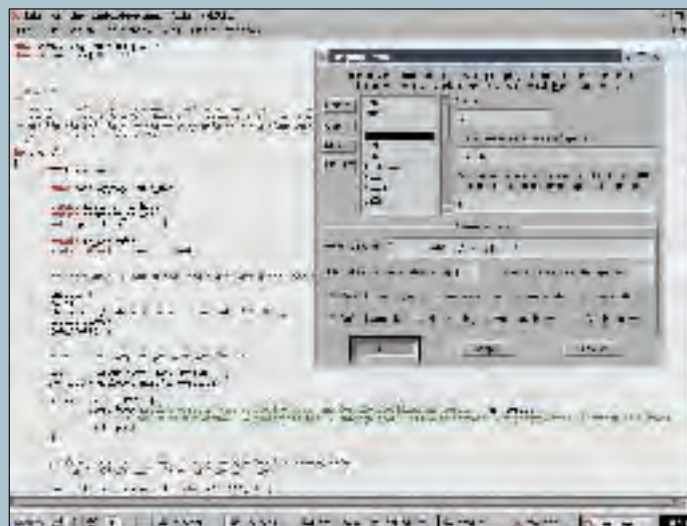
*Special*. Many distros include *NEdit* in their package archives, but the source tarball and binary RPM on our coverdisc should do the job in most

cases. **make linux** will compile the editor with *LessTif*; if this fails, the pre-compiled binaries already have *LessTif* statically linked in.

With a focus on friendly design for newcomers and a large array of goodies for experienced coders, *NEdit* certainly excels on the feature front. Its minimalist menu-driven interface is straightforward to understand; similarly the keybindings and context menu make it very familiar. Yet under the

hood, support for a great range of both common and esoteric languages (with syntax highlighting) is available, together with a macro facility, unlimited undo/redo, auto indent, parenthesis flashing (enormously handy) and various useful shell commands. These work on the current text, so being able to use **sort(1)**, **a/ispell** and any other command-line tools is a bonus. The program also supports many different platforms, including mac OS X, MS Windows, SGI systems, HP UX, AIX, Solaris/Sun OS, and even OS/2.

Default settings can all be tuned through the program – font, window size, indent, wrap and the shell commands menu. For an application primarily targeted at hackers, it's lovely to see that a well-written and comprehensive online manual has been included for good measure. While *NEdit*'s main featureset will be of most interest to programmers, it's still a fine all-round editor and is fast and capable to boot. Plus, the long development history (dating back over a decade) has helped it to be rock-solid and ultra dependable – essential for professional use.



NEdit at work with a file open, also showing the lang properties box.

## MAIL TRANSFER AGENT

## Exim

■ VERSION 4.24 ■ WEB [www.exim.org/](http://www.exim.org/)

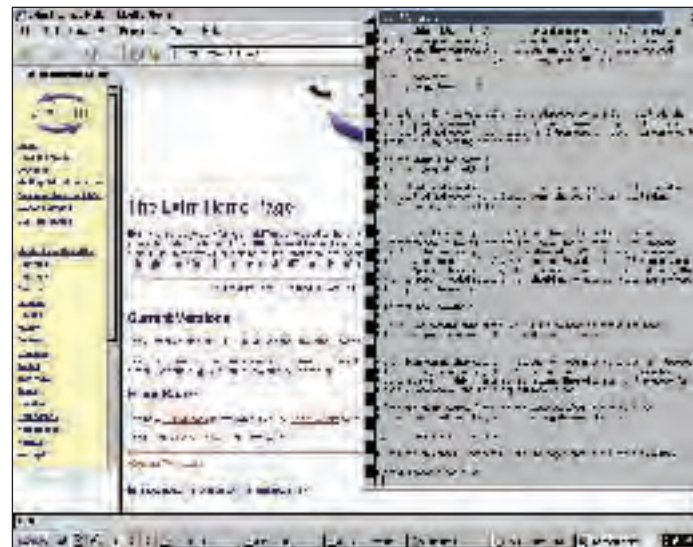
**Popularity:** does it always reflect on a product's quality? Judging by the way that VHS usurped Betamax in all but the professional arena, Windows is currently more popular than Linux, and more youngsters would rather spend their pocket money on buying singles of unoriginal cover songs screamed by manufactured pop acts dreamed up by fat middle-aged marketeers and accountants, rather than listen to a good bit of Telemann or *Rage Against The Machine*, we can safely say NO – in capital letters. In a similar vein, *Sendmail* is the most widely deployed MTA and yet many would argue that alternatives such as *Postfix*, *Qmail* and *Exim* are superior. We haven't covered the latter much in LXF, so this month we're giving it a look.

*Exim* strives to be a fast, reliable and scalable MTA, and has seen lots of large-scale real-world use –

Freemove, one of the UK's biggest ISPs, uses it, as do many other companies and organisations. Chances are it's included with your distro among the server apps; if not, editing `src/EDITME` and copying it to `Local/Makefile` and then entering **make** will begin the build process.

Pleasingly, *Exim*'s configuration file is well documented with sane keywords and a reasonably logical structure (those used to crafting *Sendmail* setups will appreciate this aspect in particular). Indeed, the main *Exim* binary shares many command-line options with *Sendmail* in order to make it more of a drop-in replacement. A basic graphical monitoring and tweaking tool, the *Athena*-based *eximon*, is also available.

Sporting support for virtual domains, host/network blocking, mail size limiting, privilege dropping and individual message filtering, *Exim*'s



*Exim*'s site and config file – about as exciting as it gets, visually!

healthy featureset makes it usable for all general purpose mail server tasks and its top-class in-depth documentation (including a comprehensive if sometimes a little verbose 23,000 line general manual) is a great bonus for admins. The blacklist-based spam-killing options are useful too.

All things considered, *Exim* is a fine alternative to *Sendmail*, and less

experienced admins will find it immediately much cleaner and simpler to configure and tune. The MTA's widespread use is testament to its stability; it doesn't have quite the sparkling security track record that's boasted by *Qmail*, but it's still respected all the same. Perhaps one of the biggest accolades is that *Exim* is the default MTA in the ultra stability-focused Debian!

## FTP SERVER

## ProFTPD

■ VERSION 1.2.9 ■ WEB <http://proftpd.linux.co.uk/>

**With the World Wide Web's** outrageous success, the trusty old File Transfer Protocol doesn't see as much exposure these days, although it's still a crucial part of the Internet as a whole. Using a great big Web browser just to pull over a file isn't elegant or efficient; FTP clients can make the job so much better. On the server side, various FTP servers are available and *ProFTPD* was born out of the developer's desire to create a powerful and secure alternative to *WU-FTPD*. For more info about FTP, see last issue's tutorial.

Quite a few distros bundle *ProFTPD*, so you may already have it in binary form – otherwise it's a cinch to compile, following the usual **.configure && make && make install** procedure. There are no bizarre library dependencies, as it just needs *GCC* and the standard libs to build, and the

only other installation decision is whether or not it's run via *inetd/xinetd*. All quick and straightforward.

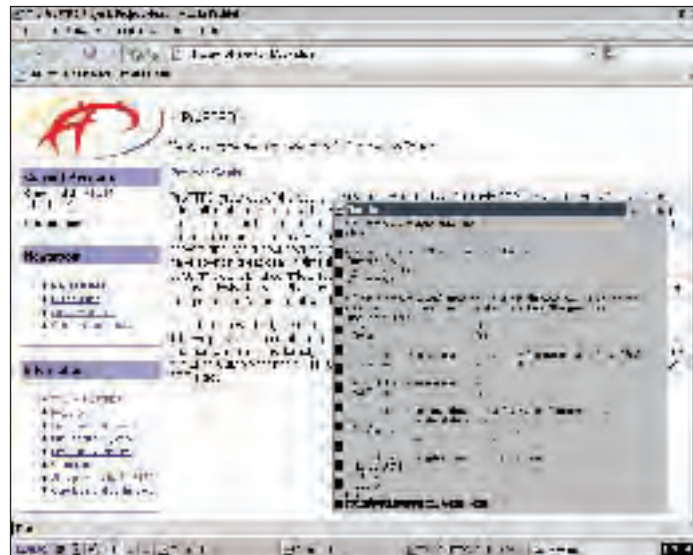
Configuring *ProFTPD* for the first time isn't too taxing, as the developers have cunningly modelled the central configuration file on *Apache*'s `httpd.conf`. Consequently, it's well-commented with understandable keywords and makes life a lot easier for newcomers and experienced admins alike. As with most modern server tools, *ProFTPD* can run as a non-privileged user for security purposes.

Together with the expected features such as anonymous access configuration, logging (in *WU-FTPD* format) and IPv6 support, *ProFTPD* is also extensible through a module system; supplied with the source are base modules to provide different authentication methods, and

interaction with an SQL server, along with various others. A fair few third-party modules can be found around the Net too. Also on the feature roster are virtual servers, 'ftpassess' configuration on a per-directory basis a la *Apache*, and stacks of other touches.

*ProFTPD* is being stressed in some impressively large roll-outs – incredibly

busy sites such as [ftp.kernel.org](http://ftp.kernel.org) and <http://sourceforge.net> are running the FTP server, along with [Slackware.com](http://Slackware.com), Linksys and many others. This confirms its stability and security – and coupled with the friendly configuration, it's a great all-rounder and well worth a look, whether you intend it for personal or business use.



Not much to show off – just *ProFTPD*'s site and configuration file.



## ONLINE 3D TANK GAME

## BZFlag

■ **VERSION** 1.7g2 ■ **WEB** [www.bzflag.org/](http://www.bzflag.org/)

**Developed during World War I** in the utmost secrecy, the tank played a major (if mostly psychological) role in that conflict's proceedings. The first tanks used in battle cruised along at a breakneck 5mph and had all manner of troubles in a scuffle you may have heard about at the Somme. Had the British government been more open about their makings (rather than hiding them as 'water carriers' during construction, hence the name) then maybe they would have fared better through some good old Open Source-like peer review. Today, tanks can be found driving over landmines all over the world or zooming around colourful 3D landscapes in *BZFlag*.

An enormously entertaining online shooting romp, *BZFlag* enjoys great popularity and sizeable communities have built up around it. The RPM we've

included on our coverdisc should work with most recent distros (*glibc* 2.3+), but otherwise compiling from source is a doddle and you can get playing straight away. Find a game server, choose a team (or Rogue for independence) and let the violence commence.

The basic game mechanics of *BZFlag* are straightforward: navigate around a 3D maze-like arena, locate power ups and destroy the opposition. There's no health meter – one shot and it's farm-buying time – and in many arenas the bullets bounce off walls for added insanity. Some game servers allow you to jump, although you can't adjust vertical aim, so good timing is required to pull off this rather untraditional strategy successfully.

It's the power-ups that make *BZFlag* a riot, though. Lasers, homing



**Purple Dude in Distance™** prepares to take on my onslaught of pain...

missiles and invisibility make life (and your opponent's death) much easier, but negative items can slow you to a sitting-duck crawl or reverse your steering. Wowzers. There are numerous variants on the game style, all of which give a great deal of replayability; your tactics and techniques matter in all, though.

The only problem with *BZFlag* – and it's a major downside to Open

Source online gaming in general – is the ability for others to cheat: just a wee bit of hacking skill all dastardly tank commanders need to add invincibility or enhance power ups beyond the realms of fair play. Still, on good servers, against a bunch of more principled opponents, the action is genuine and it's all supremely enjoyable projectile-based Combat-esque fun with smooth visuals to boot.

## SUPER NES EMULATOR

## ZSNES

■ **VERSION** 1.36 ■ **WEB** [www.zsnes.com/](http://www.zsnes.com/)

**Nintendo's Super NES, known** as the Super Famicom in the East, is fondly remembered by many gamers as the zenith of early 1990s gaming and the absolute pinnacle of 2D entertainment. Having shifted a whopping 49 million units of the console in its lifespan, Nintendo was able to capitalise on its back-catalogue by releasing such near-perfect titles as *Mario World* and *Zelda III* in the pocket-sized Game Boy Advance incarnations; few other companies have had such an opportunity.

Indeed, the sheer quality of such games has led to SNES emulation being A Big Thing – *Snes9x* is one of the best-known emulators, with an early Unix port, but the busy *ZSNES* coding crew

produced a Linux version not long after. The RPM supplied on our coverdisc should work with Mandrake and other recent distros, but building from source is an option (you'll need *SDL* and a very specific version of *NASM* to compile).

*ZSNES'* interface is slightly unusual in that it doesn't use any common X toolkit, but incorporates its own *WIMP* environment in the main window. This works fine; the operations for loading games and modifying options are all easily available. Although over 1,000 games were released for the SNES and it's hard to judge compatibility, *ZSNES* is perhaps the best that is available for Linux – SuperFX and DSP games such as *Stunt Race FX* (*WildTrax*) and the lovely *Pilotwings* work beautifully.



**MegaDrive/Genesis fans – we'll review an emulator for you next month!**

Together with the common features of state-saving (memory snapshot), joypad configuration and window/fullscreen modes, also present are a smart Game Genie code system and emulated multiplayer network setup. Those interested in delving into a game's workings can toggle sound channels and graphics layers on and off, and everything works flawlessly.

Despite the peculiar interface, *ZSNES* insulates the player from too too much hassle and compatibility is the most crucial part. The x86 asm CPU core helps games run smoothly, even on a Pentium 233. For re-living such golden classics as *Mario Kart*, *Secret of Mana* and *Streetfighter 2*, or just for an easy start in the world of retro gaming, *ZSNES* is superb. **LXF**

## BIGGEST HITTERS

Our future in their hands:

# ten of Linux's biggest hitters

cover feature



Sleuthing about in his long raincoat and trilby-hatted gumshoe attire, **Michael Saunders** fits up the major players in Linux and Open Source.

**W**ith all the rapid and exciting technological advances going on in the Linux world – distro updates, new software, large companies endorsing the OS – it's easy to forget about the people in the background: the developers, managers, testers, artists and

advocates: all improving the tools and communities we are lucky enough to benefit from today. Many of the big movers and shakers tend to keep a low profile, and a few aren't known outside of their own specific circles.

So, this month as a part of our 50th issue celebrations, we're looking at ten major players in the Linux industry (well, nine men and a handful

of women), along with a few others who deserve a mention, giving an overview of their past, their current work and why they're significant in the future of Linux. A detailed examination could fill a whole magazine, so instead of trying to compress

everyone's history too much, we've included (where possible) links to

personal sites and/or biographies. We've selected our line-up from a broad range of participants in the Linux world and naturally some people will be left out; if you're a Slackware fan, for example, you'd understandably want to see Pat Volkerding included. As a result, we've chosen players who have an overall influence on Linux.



## LINUS BENEDICT TORVALDS

Just think, you could have been holding *Freax Format* magazine right now...

**Function** Lead kernel developer

**Nationality** Finnish

**Website** [www.cs.helsinki.fi/u/torvalds/](http://www.cs.helsinki.fi/u/torvalds/)

### The main man. The head honcho.

As creator and lead developer of the kernel at OSDL, Linus Torvalds is the public face of Linux and has overall responsibility for its direction. Torvalds was born in Finland in 1969 and demonstrated a precocious flair with computers, coding games in his teens; at Helsinki university his ability had grown so much he attempted his own OS core.

Finding Minix (a basic UNIX-like) and MS-DOS to be too limiting, the

Swedish-speaking guru put together a simple 386-only 'Freax' kernel and invited others to contribute over the Internet. One name change later (plus adoption of the GPL) and coders worldwide started helping out.

Reading emails, programming, reading emails, sleeping, reading emails and spending time with his wife and daughters – Torvalds' modern life leaves little time for much relaxation, especially as the 2.6 kernel revs up. And the popular press depiction of the man as a 21st century David against a Redmond-based Goliath doesn't help; Torvalds prefers to avoid

the politics of the pro/anti Microsoft debate and focus his efforts on being an effective project leader.

In this world of management buzzwords and product launches saturated in hyperbole, Torvalds' approach is refreshingly down-to-earth and pragmatic. When asked why he wouldn't include a debugger in the kernel, Torvalds explained how it encourages laziness and finished with "Because I'm a bastard." He's well known for self-deprecating quips, and his knack for solving disputes and writing great code will provide us with reliable kernels into the future.



**Linus Torvalds: "because I'm a bastard..."**

## RICHARD MATTHEW STALLMAN (RMS)

Recursive acronyms aplenty with Stallman's GNU and Hurd.

**Function** FSF President

**Nationality** USA

**Website** [www.stallman.org](http://www.stallman.org)

### Perhaps the most controversial

character in this article, RMS doesn't receive the press attention that Torvalds and co are used to, and yet his importance in the Linux and Free Software world is enormous. Stallman joined MIT (Massachusetts Institute of Technology) in the 1970s as a programmer, and became accustomed to its spirit of code and idea-sharing. As the commercial software market grew, though, Stallman saw these

freedoms being eroded as companies became reticent about revealing source code and information.

This prompted the talented hacker to make a stand: rather than watch his freedoms get snatched away in the name of money, he established the Free Software Foundation and GNU Project in the early 1980s. The latter aimed to build a whole UNIX-like operating system (GNU's Not UNIX) from purely open code for anyone to distribute, and he worked on GCC, Emacs and others. However, GNU's Hurd kernel wasn't progressing with much pace and by 1991 Torvalds' Linux helped make it a

complete system – GNU/Linux as Stallman prefers to call it.

As President of the FSF, Stallman RMS devotes much of his time to speeches and promotional work, spreading the word of software freedom and related issues such as patents. Although some disagree with his 'GNU/Linux' stance, the man's stunning coding achievements and admirable tenacity in building a totally free OS will go down in history. Without Stallman, Linux would not have existed in the form we know it today.



**RMS's butterfly-charming methods helps GNU/Linux adoption in India...**

## ALAN COX

A hacker without a beard is like a horse that plays *Tetris*: very rare.

**Function** Kernel hacker

**Nationality** British

**Website** [www.linux.org.uk](http://www.linux.org.uk)

### Solihull-born bearded coding

machine Alan Cox is generally regarded as 'second in command' to Torvalds for kernel development decisions. The Red Hat employee, currently enjoying a year out to study at Swansea university, is well known for his -ac kernel branches which act as a safe testing ground for new features. If they prove to be stable, they make it into the main tree.

Like many famous programmers today, Cox started off toying with the first mass-market home computers such as the ZX81; these rudimentary machines provided heaps of hackability and instigated a colourful career in programming. After a brief spell in the games industry, Cox bumped into the young Linux kernel when developing a text adventure, and by fixing bugs and adding code he became part of the Linux family. A few jobs with ISPs followed, as did marriage to partner Telsa Gwynne, and he settled into a job at Red Hat.

Cox's expertise isn't confined to one area of the kernel – his work on sound, networking and other components is widely respected, and equally at Red Hat he's involved with various projects and is active on the new Fedora lists. As maintainer of the 2.2 kernel, Cox is responsible for the ultra-stable tree still in use by many companies, and there's no doubt that his masterly hacking skills and sound technical judgement will be of crucial importance as the Linux market expands exponentially over the next few years.



**Fedora was on LXF49's discs – get a copy and try out Cox's work.** >>

## BIGGEST HITTERS

### « WOMEN IN LINUX

It's not just toys for the boys in Linux land...

**Function** Various  
**Nationality** Various  
**Website** Various

**The computing world in general** tends to be rather male-dominated, particularly on the software development side, and this is mostly true of the Linux and Open Source communities too. Nevertheless, women play an important role in many projects – we've bunched together some of the more notable in this subsection.



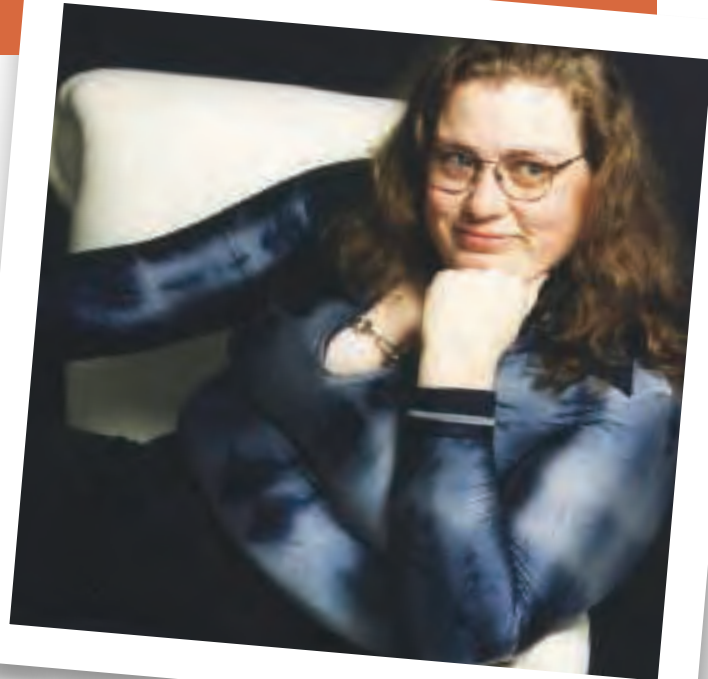
**Mitchell Baker**, general manager of **Mozilla.org** (or the 'Chief Lizard Wrangler' as she's commonly known) works day-to-day with companies and developers that are making use of the Open Source browser. As a former Netscape employee dealing in legal issues, Baker was responsible for the Mozilla Public License and monitors Mozilla's progress as a whole.

As *OpenOffice.org* picks up momentum, **Solveig Haugland** has played a large role in advocating and teaching users about the free office suite; her books on the subject have given newcomers an approachable introduction, and she has run training courses for hands-on learning.

**Carly Fiorina**, HP's CEO, has no direct ties with the Open Source world, but her company's expanding Linux strategy makes her one of the most powerful figures in corporate takeup of the Linux OS. Meanwhile, over at <http://women.kde.org>, the ever-popular KDE desktop project is encouraging women to

get involved with development and website issues.

There's a dedicated women's site for all things Linux: **Jenn Vesperman's** [www.linuxchix.org](http://www.linuxchix.org) which collects together all sorts of useful information. And who could forget **Kelley Corten**, publisher of *Linux Format* or SUSE's **Jasmine Ul-Haque**?



**Jenn Vesperman (above),  
Carly Fiorina (left).**

### MATTHEW J SZULIK

Red Hat's big boss is bringing Linux into large companies.

**Function** Chairman and CEO, Red Hat  
**Nationality** USA  
**Website** [www.redhat.com/about/corporate/team/szulik.html](http://www.redhat.com/about/corporate/team/szulik.html)

**Red Hat is without doubt the most** prominent commercial Linux vendor, with an almost household-name brand and successful bunch of enterprise distro offerings, and funds much development of *GCC*, *glibc*, *XFree86*, *GNOME* and others. Matthew Szulik, as CEO of the Raleigh, North Carolina-based business, holds a crucial position in shaping the company's future and helping to greatly boost Linux's mainstream presence.

Prior to joining Red Hat, Szulik's busy career had taken him through a number of tech startups, building up

such companies as Interleaf, MapInfo and Relatively Software. By 1998, he was sufficiently intrigued by the potential in Linux and the possibility of 'revolutionising an industry' and began work at the company. This was shortly before the IPO.

A no-nonsense man with bags of experience, Szulik doesn't mince his words in interviews and explains his thoughts with appropriate and confidence-boosting focus. Now his company's under considerable pressure because of SCO's allegations and attacks, but he's proved his strength and raised Linux community cheer by filing a lawsuit in retaliation.

With Red Hat's focus clearly on the enterprise (and the popular RH distro being halted in favour of Fedora), Szulik has to keep the

developers and hobbyists happy while still making money from the big sales. His company is the *de facto* corporate image of Linux, and he's ensuring that it has a healthy future.

**Will he still be smiling quite so broadly after hearing Perens' opinion of Fedora?**





## ERIC S RAYMOND

Guns, Tae Kwon Do and Fetchmail – a lethal combination.

**Function** Linux speaker/writer/advocate

**Nationality** USA

**Website** [www.catb.org/~esr/](http://www.catb.org/~esr/)

**Known for his love of guns and** martial arts (and also his worryingly in-depth 'Sex Tips For Geeks' guide), Eric Raymond is a staunch Open Source activist and speaker. His magnum opus, *The Cathedral and the Bazaar*, (O'Reilly, ISBN 0-5960-0108-8) was well received by the community as a definitive writing to explain how the free software model

works – it has influenced many and boosted Raymond's image so much that he is often contacted by the media for his point of view, and consulted by companies or organisations that are producing their own Open Source licenses.

Raymond describes himself as a "long-time hacker, active in the Internet culture since the 1970s, who got unexpectedly famous in the late 1990s" Born in Boston, Massachusetts in 1957, Raymond was exposed to computers through his father and

became fanatical about hacker culture – later on he updated the famous Jargon File and created a print version in *The New Hacker's Dictionary* (MIT Press; ISBN: 0-2626-8092-0).

On the software side, Raymond has been involved in various projects including the popular *Fetchmail* mail-retrieval tool, the *ncurses* text-based widget library, and more recently the ultimately unsuccessful CML2 kernel configuration system. Along with Bruce Perens, Larry Augustin and others, Raymond helped to coin the

term 'Open Source' as a more business-friendly alternative to the capitalist-scaring 'free software'.

While many of Raymond's opinions and writings attract fiery criticism from some quarters, his aggressive advocacy and determined efforts to get businesses *understanding* what free software has to offer has to be applauded, and *The Cathedral and the Bazaar* will serve as a hugely useful text for years to come. Sample content is downloadable from his website and other places on the Net.

## BRUCE PERENS

Ex-Pixar and HP employee noted for his powerful advocacy work.

**Function** Linux writer/speaker/advocate

**Nationality** USA

**Website** [www.perens.com](http://www.perens.com)

**Multi-talented Bruce Perens enjoys** great popularity in the Linux and free software spheres as an advocate, writer and spokesman. With a lengthy history in the computer graphics field, including software engineering stints at NYIT and Pixar, Perens has an innate knowledge of both the programming and social sides of computing, and like Eric Raymond, isn't afraid of courting controversy when expressing his point of view, as the quote below shows!

Following his work in the CG industry, Perens took a job at HP in 2000 as the company's Senior Strategist in Linux and Open Source. He states proudly that his job was to 'challenge the management' and re-tune the company's approach to this new phenomenon – unfortunately, the merger with Compaq resulted in widespread changes and he left to start his own consulting firm.

Along with the *Electric Fence* debugging util and *BusyBox* suite of

low-resource system tools, Perens' main free software programming has been in the Debian project. He's also been a key figure in the formation of the Linux Standards base, Open

Source Initiative and similar organisations, and occasionally pops onto Slashdot to join in the discussion.

Perens is a model Open Source advocate; he's had experience of the computer industry, is a good speaker and doesn't go over the top with hype and fantasy. And as companies fall over themselves to get a slice of the Linux action, Perens, like Raymond, will be there to guide them and make sure they co-operate in a proper fashion with the community.

**That tie alone is living proof that Linux is ready for enterprise...**



**“The Open Source community is supposed to produce Fedora so Red Hat can put a stamp on it and charge lots of money...”**



## BIGGEST HITTERS

## « MATTHIAS ETRICH

Before this man, FVWM95 was seen as the height of Linux usability.

**Function** KDE founder, Trolltech employee

**Nationality** German

**Website** <http://kde.org/>

**The early releases of the KDE**

project were of mammoth value to Linux's progress as a desktop OS – they brought a consistent suite of



**“A conference is an excellent place to finally give in to your burning desire to create free software every spare minute...”**

end-user graphical tools to the traditionally command-based Linux OS, and the one man we can thank for this is Matthias Ettrich. Born in 1972 in Bietigheim, South Germany, Ettrich studied at Tuebingen's Eberhard-Karls University and now works at Trolltech, the company behind Qt – the toolkit on which KDE and many other programs are built).

In October 1996, Ettrich posted a mailing list message asking for other developers to get involved in his project. His 'Kool Desktop Environment: Programmers Wanted' post is a historical gem and outlines the original plan – a lot of the thoughts and ideas remain in place

today. As Ettrich was working on another app at the time (*LyX*) it was vitally important that others helped out, and now the community has hundreds of developers.

Seven years have passed since that message, and Ettrich is now Director of Software Development at Trolltech, working on Qt and finding time to help out with KDE too. While these days he's not quite as involved with the rapidly developing desktop suite as in earlier times, his work on making UNIX accessible to the masses and attracting developers to such a daunting job is to be commended. Even though GNOME has caught up in terms of features and user interface, KDE initiated it all and continues as the most popular Linux desktop.

**Matthias Ettrich: Variatio delectat (variety gives joy).**

## JIM STALLINGS

Big Blue's Linux boss is driving the company down a new path.

**Function** General Manager of Linux, IBM

**Nationality** USA

**Website** [www-1.ibm.com/linux/news/stallings.shtml](http://www-1.ibm.com/linux/news/stallings.shtml)

**IBM's pledge to pump \$1 billion**

into Linux research, development and marketing was a monumental event for the community. Here a traditionally closed and conservative megacorp was embracing a new, radically different and disruptive technology, and while many were cautious initially it was widely agreed that such a gigantic supporter would be good in the long run. Jim Stallings recently took over from Steve Solazzo as IBM's General Manager of Linux.

Having spent 18 years with IBM, including work in the sales and AS/400 groups, Stallings now oversees 250 people in the Linux Technology Center. Their work

includes kernel enhancements for stability and scalability on IBM's beefy hardware, among other projects, and a quick scan of the linux-kernel mailing list confirms the giant's involvement and commitment to improving the OS.

Now IBM faces trouble from SCO's (still mystifyingly vague) allegations; most are in agreement that IBM's colossal patent warchest, excellent legal team and overall lack of any obvious wrongdoing will pull them through this brouhaha. Similarly, the company has to continue supporting its own AIX operating system while promoting Linux on the lower-end, but Stallings appears confident about the road ahead.

As the world's largest computer company, IBM and Stallings' Linux moves can have a huge impact on the market as a whole. For now, things are going very well indeed.



**IBM Linux GM, Jim Stallings.**



## EBEN MOGLEN

Free Software Foundation's legal guru.

**Function** General Counsel to FSF

**Nationality** USA

**Website** <http://emoglen.law.columbia.edu>

### Whenever Stallman's Free

Software Foundation has to deal with any kind of legal issues, Eben Moglen is usually the man for the job. As Professor of Law and Legal History at Columbia Law School in the USA, Moglen also serves *pro bono* (without fee) as General Counsel of the FSF, assisting the non-profit organisation and writing supremely helpful commentaries on free software matters such as SCO's behaviour and enforcing the GPL.

Moglen spent the early 1980s at IBM as a programmer and analyst, and later moved into the legal field. His tireless work to bring archaic copyright and patent laws into the modern digital world earned him a 2003 Annual Pioneer Award from the EFF (Electronic Frontier Foundation). He has run courses on such topics as 'Computers, Privacy and the Constitution' and 'Law in the Internet Society', and written countless essays on encryption, history and Microsoft's actions.

With Linux beginning to hit the mainstream, and more companies now using GPLed code in their products, Moglen's in-depth knowledge of the law gives the FSF a strong legal

backbone and will hopefully help to prevent too many license violations. Additionally, as the SCO drama unfolds, Moglen's essays and explanations are providing the community with valuable

down-to-earth and understandable views on the somewhat arcane proceedings. He deserves a big round of applause for his work supporting the FSF and community. **LXF**

**Eben Moglen: "When all ergonomic design is performed by the econodwarf, can a man stand up?"**



## HONOURABLE MENTIONS

Other key figures in the community.

**Space constraints limit us to these few major figures, but there are so many others, including these...**

**Eric Allman** – Developer of *Sendmail*, the most widely used MTA  
[www.sendmail.org/~eric/](http://www.sendmail.org/~eric/)

**Brian Behlendorf** – Co-founder of Apache (web server) Software Foundation  
[www.behlendorf.com/~brian/](http://www.behlendorf.com/~brian/)

**Miguel de Icaza** – Ximian CTO and co-founder of the GNOME desktop project  
<http://primates.ximian.com/~miguel/>

**Klaus Knopper** – Creator of Knoppix, a fantastic bootable live Linux CD distro  
[www.knopper.net/knopper/](http://www.knopper.net/knopper/)

**Jacques Le Marois and Gaël Duval** – Co-founders of MandrakeSoft  
[www.mandrakesoft.com/company/about/executives](http://www.mandrakesoft.com/company/about/executives)

**Laurence Lessig** – Law Professor known for online rights / copyright work  
[www.lessig.org](http://www.lessig.org)

**Martin Michlmayr** – Project Leader for the Debian distribution  
[www.cyrius.com](http://www.cyrius.com)

**Andrew Morton** – Kernel hacker and likely maintainer of 2.6 –  
[www.zipworld.com.au/~akpm/](http://www.zipworld.com.au/~akpm/)

**Michael Robertson** – Lindows CEO, Linux (self)publicist extraordinaire and big fly in Microsoft's ointment  
[www.lindows.com/](http://www.lindows.com/)

**Richard Seibt** – CEO of German Linux vendor SUSE (now owned by Novell)  
[www.suse.com/us/company/suse/suse/particulars.html](http://www.suse.com/us/company/suse/suse/particulars.html)

**Marcel Tosatti** – Current maintainer of the stable 2.4 series Linux kernel  
[www.marcelothewonderpenguin.com](http://www.marcelothewonderpenguin.com)

**Patrick Volkerding** – Developer of Slackware, the longest-running distro  
[www.slackware.com/about/](http://www.slackware.com/about/)

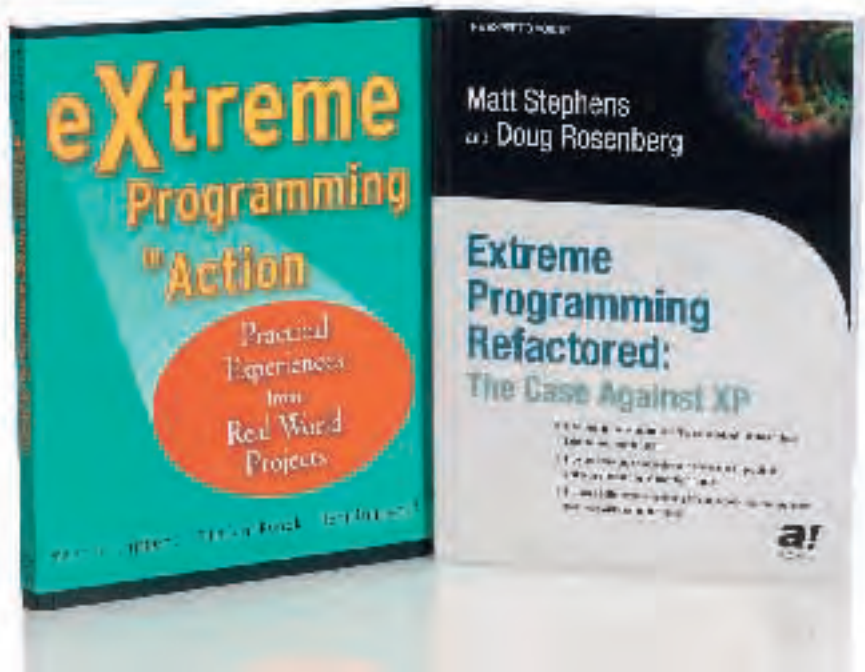
**Larry Wall** – Creator of Perl programming language  
[www.wall.org/~larry/](http://www.wall.org/~larry/)

**You** – Linux users everywhere! Without a dedicated following, GNU/Linux would have remained an entirely academic exercise...

The case for and against... XP

# EXTREME PROGRAMMING

Alarmed to see the letters 'XP' in a Linux magazine? Don't be – it's nothing to do with the Microsoft bloatware. **Jono Bacon** referees a discussion between an advocate and an adversary of the Extreme Programming paradigm.



Software development is a complex process. It involves many different developers writing many different lines of code that have to interact with many other developers writing many more lines of code. This apparent web of complexity has led to the development of a number of working practices and methods that are intended to tie up these different elements of a project and combine them together to meet the end result quicker, cheaper and more efficiently.

There are many different types of working methods and paradigms available to solve this development complexity, and recently one of the most controversial and discussed about methods is Extreme Programming (XP). The concept of XP is that development

is a more practical procedure and testing begins at the start of the development cycle. An emphasis is placed on teamwork and group discussion, and the theory is that XP should be able to handle issues and bumps in the development process easily. The big question of course is whether it actually works. To perform a good analysis of the subject, LXF got in touch with two main advocates with an interest in XP.

The first is **Martin Lippert**, co-author of *Extreme Programming in Action* (Wiley, ISBN 0-4708-4705-0) who shares with us his view that XP can be practically used.

Providing the sceptics' view of XP is **Matt Stephens**, co-author of *Extreme Programming Refactored: The Case Against XP* (APress, ISBN 1-5905-9096-1).

## The concept of XP

To begin with, we first need to identify the different views on what XP is exactly. The definition of a definition in many cases is confusion, so we first asked Martin his views on what XP is: **"For me, Extreme Programming is an agile development method that basically allows teams to produce high quality code all the time at a tremendous speed. XP makes this possible by using a pragmatic combination of basic values, a number of principles and last but not least a set of practices, like pair programming, simple design, refactoring, testing or continuous integration, to name just a few. Within this way of producing software, communication gets more important than contract negotiation, working software more important than comprehensive documentation, individuals and interaction more important than processes and tools; and most notably, responding to change gets more important than following a plan (see <http://agilemanifesto.org/>). Someone once said 'XP puts the human side back into the software development business'. At the end, both sides benefit from XP: the customer gets working software that fits exactly his needs as fast as possible while the development team can do what it can best: develop good software."**



It certainly sounds like XP is a perfect model for software development. After all, customer satisfaction and happy developers are key to the morale and lifeblood of a project. Matt is not entirely convinced of XP though, and feels that it has been somewhat over-hyped:

***"XP suffers from too much hype and 'ra-ra', insufficient up-front design, insufficient documentation, a cavalier attitude towards requirements, too much interdependency between XP practices, lack of scalability, and mandatory pair programming."***

From Matt's response, it seems that both camps have a fairly inverse view on the merits of XP and its practices, such as pair programming and up-front design. XP cannot really be as controversial as it seems? Surely if there is a possibility that customer satisfaction and developer morale can be increased, it should be considered for development? Martin follows this view and reacted to Matt's statement: ***"The XP hype is already over, from my point of view. I talk to more and more people who are using Extreme Programming for various projects successfully. Even many larger organisations are using Extreme Programming as part of their daily development. In addition to that, the practices behind Extreme Programming are not new. XP combines a set of proven techniques that are well-known and have proven their value for years. What XP makes unique is the way they are combined. That is why Extreme Programming produces the best results if all practices are used together. The interdependencies***

***between them are therefore a great benefit, from my point of view. Having wind is nice. Having some drapery is nice, too. But the most benefit you get out of those things if you combine them and sail."***

Even though XP seems to embody a radical view in customer feedback and developer positioning, it seems the core techniques are well established, and some newer techniques have been added to complement them. Martin went on to discuss the concept of documentation with agile development:

***"The documentation issue is an often misunderstood principle of Extreme Programming. For most agile methods, working software is more important than comprehensive documentation (see the agile manifesto). But 'is more important' does not mean that documentation becomes obsolete. If documentation (and even comprehensive) documentation is of some value for the customer, an XP team will produce it. But most customers I know would like to see a working piece of software and add features to that software before several hundred pages of documentation are produced. At the end the customer decides what is important and valuable for him. And the XP team will produce exactly that. The same is true for the "normal" requirements. They drive the complete XP process all the time.***

***"And requirements change over time. This is what XP makes so extremely powerful: changing requirements become daily business without reducing the speed of the development team."***

***"The scalability issue is a real big point. In general, XP works fine for teams of 10-20 people. Some people have got even 30 people to work with XP successfully. More people makes it more difficult (as it is true for most of the other development methods that are around, too). If you would like to use Extreme Programming with larger teams, you need to adopt it to this situation. Additional practices are needed for example, but it is possible."***

It seems clear that for small development teams, XP can be a suitable solution. XP certainly offers a method of essentially banking on the unknown and taking care of requirements that may have not been considered at all. There is no doubt that XP has been used successfully by some teams, but Matt questions the success of XP:

***"This is a straightforward exposition of XP theory and often claimed benefits; ie the standard XP party-line hype. We've been hearing this hyperbole unchallenged for years, but we don't believe that the facts back up the hype. Certainly not the facts we've seen. The question is whether, in practice, these theoretical benefits are realised. Experience from many people that we've spoken to indicates quite the opposite."***

## THE PROCESS OF EXTREME PROGRAMMING

Implementing XP on a typical project typically involves first getting some user stories and conducting some identification of typical design problems that will be encountered in the project. These problems can be tested by developing a Spike System that will try different methods of approaching the problem. This system will give you an idea of the final solution that you will re-implement later. When this initial work is complete, a schedule can be developed that takes into account managers, developers, customers and other parties. This schedule will allow the development of the project to involve regular testing from the first day onwards. This schedule needs to be complete and adhered to.

When the project is in full development, other techniques such as pair programming can be used to ensure that the development team are working together effectively to actively solve problems and prevent other risks. This is of course tied in with extensive testing, and systems to handle customer and developer feedback to change the requirements where needed.

Do you think this can work? Do you feel it can be applied practically? Well, that is for you to decide, readers!

***"Extreme Programming combines a set of proven techniques that are well-known and have proven their value for years..."***



Left: **Matt Stephens**, XP critic. Right: **Martin Lippert**, XP advocate.



***When writing XP Refactored, I received emails which we call the voice of experience (VoXP) such as this:***

***'I've just joined a project using XP. I really wished I had some critical info before jumping in. The pair programming is absolutely mind-numbing.'***

***With this XP stuff, software development is no longer a professional occupation, it's just another type of assembly-line work. We're herded into a small room like telemarketers. Actually, I***



## EXTREME PROGRAMMING



*bet telemarketers have a better work environment.'*

*"Anyway, back to our response to the 'pro-XP' statements...*

*Contrast the statement 'puts the human side back into software development' with this statement from one of our VoXP correspondents in XPR: 'The threat of losing your job if you don't pair up is tremendous pressure.'"*

## Practical implementation

At this point, it is clear that we have two widely different views on the applicability of XP, and both views are backed up with the kind of information you'd expect of respected authors.

We direct the discussion now on the practicality of applying XP to real-world projects, and we first asked Martin his view on how well XP can be used

in the real world:

*"The best situation in which XP could be applied is a small team of motivated developers, a customer who is willing to try it out and who is able to take responsibility and a management that supports the XP team. But people within the community collected a lot of experience how to successfully adopt XP to various different and difficult situations. Nevertheless, you get the most out of XP if you have to face changing and unclear requirements. But this is the case for most projects that I have seen.*

*"From my point of view, the best way to start using XP is to put a coach into the team and let him decide how to adapt XP. I most like the way to start with the complete process right away. But I also saw projects adapting practice after practice successfully diving into XP."*

So with the issue of XP being practical, Martin's view is that there is the ability to accommodate changing requirements, but developers should ensure that a coach is placed within the team to establish the development culture to get the most out of XP. There are of course two sides to a discussion, and Matt believes that XP is not actually quite so clear-cut in terms of successful practical use:

*"Some parts of XP can be reasonably applied. In fact, most projects would benefit from applying the Test-Driven Development (TDD) aspects of XP. XP might cause problems when its more rigid practices face opposition, eg due to team culture. Pair programming is a good example. Some programmers – generally the extroverted ones – love to pair up, and expect everyone else to feel the same way. However, introverted programmers – people who like to concentrate – tend to dislike being forced to pair up all day and to switch partners just when they're settling down into a good working relationship. In fact, the resistance to pair programming is becoming really noticeable in the industry – and can be a real headache for project managers if there are personality clashes within a team.*

*"XP promotes a particular mindset when it comes to up-front design. To a seasoned XPer, who designs as he goes along (eg ten minutes of design before each programming session), it makes perfect sense to say: 'I do up-front design all the time!' To other people, this seems paradoxical and frankly daft. XP does seem to eschew the benefits of proper up-front design, as if it can't be done.*

**"The chance of hitting a big design flaw because things weren't thought through makes Extreme Programming high-risk."**

*But not addressing design concerns in sufficient detail before coding stores up lots of problems for later.*

*For example, XP doesn't adequately address the fringe cases – the exceptions – that can shape a design. Instead these issues are addressed as and when you get to them. This may or may not work – but they're flying by the seat of their pants. They're increasing the risk of hitting a big design flaw because they didn't think things through at the start. It's one of the things that makes XP high-risk."*

It seems that the social issues of XP are definitely on show here. Social issues and how they affect product development in all areas of industry is often overlooked; and when they are considered, the results can be even worse through over-administration and over-legislation. Matt used the concept of Pair Programming as an example, and specified that the social issues and personality of the programmer can affect their successful use of pair programming. This technique involves two programmers working together, where one will act as the driver and perform the coding on a single computer, with the other acting as an observer. The idea is that while one programmer is coding, the other can observe for syntactical and structural problems in the code as they can view it from a different perspective to the driver. This is one of the concepts that is ingrained in XP, and Martin went on to discuss this:

*"I would agree in some ways, and pair programming is for sure one of the most-discussed practices of XP. But Extreme Programming is a team-working discipline, and it forces people to work together. If the team culture is based on lone fighting, mistrust among the team members, and strong code ownership, it will be more complicated for them to adapt XP than to other teams. My personal experience with pair programming is*

*this: even coders who were afraid of pair programming at the beginning asked me after two weeks within an XP team to not let them program alone. But there are a lot of issues and possible problems that could make pair programming hard and cumbersome.*

*"My recommendation in those cases is: do not force them to do XP. Let people do XP who want to learn something new or who are willing to try something out. Maybe Extreme Programming is not suitable for everybody."*





With Martin identifying that XP may not be for everyone, but that it does indeed work for some projects, Matt went on to highlight some issues discussed earlier:

*“There are a couple of things we have an issue with here:*

**1 ‘Customer gets his needs filled as quickly as possible’ – this didn’t really happen on the legendary C3 payroll project (the first XP project, hyped as a success even though the signs were that it was a failure). On C3, after four years of endless refactoring, the original XP team (who described themselves as ‘the best team on the face of the Earth’) had only delivered one-third of the project. They were way behind schedule, had strayed off-course so that they weren’t delivering what the customer really wanted, and – not surprisingly – the project was canned. About a year later, an article appeared in *The Economist* describing the C3 project as a success.**

**2 ‘Customer taking responsibility’ – XP offloads responsibility for many aspects of software projects onto an onsite customer. As a result, the customer is one of the biggest single risk factors on an XP project. How much responsibility gets offloaded to the customer in XP? Here’s a list that we found in a paper called Customer Involvement in Extreme Programming XP2001 Workshop Report:**

- *Understanding customer wishes, maintaining regular contact with end users, and balancing their potentially conflicting interests.*
- *Talking to developers, clarifying feature requests when needed, and understanding some of the developers’ technical concerns.*
- *Specifying functional tests for user stories, and verifying that these tests run correctly.*
- *Participating in the planning of iterations and releases.*
- *Maintaining good contact with management, explaining progress, and justifying time spent with the development team.*
- *Being a customer requires a number of skills that are independent of the application domain. These include balancing potentially conflicting end-user needs, experience in requirements*

*gathering, reporting to upper management, controlling the budget, and checking for forgotten requirements.’*

*“Originally, all this was supposed to be done by a single individual. Not surprisingly, even XP’s creator, Kent Beck, now admits that this was ‘an error of early XP thinking’. Nowadays XP advocates say that projects should have ‘customer teams’. But, if the customer team doesn’t ‘speak with a single voice’, massive problems arise, because so much in XP relies on face-to-face communication.*

*As mentioned in the above list, the customer is also responsible for writing and maintaining the customer/acceptance tests. These tests must take into account the all-important ‘fringe cases’ (the what-ifs, or alternative scenarios, such as ‘what if the user login fails?’) which can account for over half of a project’s functionality.*

*Because of the way that the requirements (user stories) are structured in XP, the customer needs to be ‘on tap’ at any time so that the programmers can get the required details for the user story that they’re working on. The customer needs to anticipate these questions and have the answers ready, otherwise that part of the project can’t proceed.*

*Having said all that, an on-site customer approach can actually be a good and beneficial thing. But the XP approach, piling so many responsibilities on the customer, can’t be healthy (in fact, the original C3 customer, who was generally very highly regarded, had to switch jobs because the on-site customer role was so stressful and demanding that it was damaging her health).*

*XP practices seem to be tailor-made for maintenance projects rather than development: that is, when at least one iteration of a project has been released, XP’s ‘inch-by-inch’ approach to making changes reduces risk, because you’re checking at every stage to see whether your revisions have inadvertently broken existing functionality. Unit tests and acceptance tests used together are an effective regression testing tool.*


*However, if you’re starting out on a new project, it’s better to start with as thorough an understanding of the requirements as possible (within a reasonable timeframe – we’re not advocating an old-style “waterfall” approach here!), and an up-front architecture and design. After that, once you’ve done the groundwork, it’s safe to apply SOME of XP’s practices to benefit the project.*

*The case we make in XPR is that if we address XP’s failure modes, it’s possible to refactor it into a process that still fulfils its agile values, albeit in a more rigorous, less failure-prone way.”*

## Conclusion

As you can see from the interesting responses from both **Martin** and **Matt**, XP is far from being a clear-cut concept. There are many differing viewpoints on XP, and even some areas that you would expect to be agreement on, there are still issues that can separate the two camps. The true question that most of you will be asking is whether it can work for you. There is no doubt that XP does have a place, and in some cases XP has been proven to work. The issue though is whether XP can be considered a sanitised development model that can be applied to different development teams and projects.

The nature of Linux development has some similarities to XP in a lot of ways. If you look at how a typical Linux application is developed, bug reports and user feedback are present at each stage of the process. The difference with this model though is that that distributed development has its own set of issues that are involved in identifying the development model.

To get a true understanding of the situation and how it relates to your project, we recommend that you get both Martin and Matt’s respective books, and try to draw your own conclusions. 

## RESOURCES

There are a number of resources on the Internet regarding XP and the different viewpoints on it. Among the more helpful ones are:

Extreme Programming: A gentle introduction

[www.extremeprogramming.org](http://www.extremeprogramming.org)

This site provides a good introduction to XP and discusses how to use it within your projects. A very pro-XP site.

Software Reality (Programming with a dose of satire)

[www.SoftwareReality.com](http://www.SoftwareReality.com)

A critical eye on agile methodologies, particularly XP.

[www.pairprogramming.com](http://www.pairprogramming.com)

This site discusses the concept of pair programming and how to implement it in projects. The site also has research and articles discussing the subject.

ICONIX Software Engineering

[www.iconixsw.com](http://www.iconixsw.com)

Often seen as a direct “competitor” to the XP process.

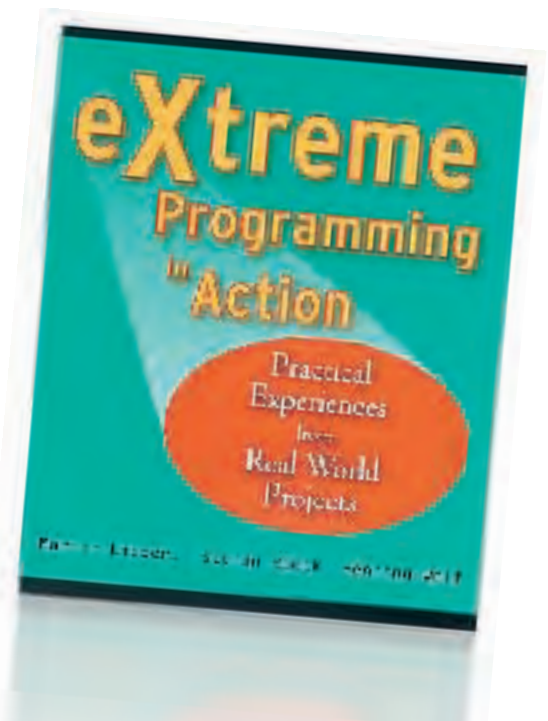
[www.xprogramming.com/](http://www.xprogramming.com/)

Another XP portal that discusses the various issues surrounding XP.

Hacknot

[www.hacknot.info](http://www.hacknot.info)

Articles and links for developers.



# What on Earth is...

# FORTRAN?

## Biagio Lucini builds a case for using an old modern programming language.

**>> Fortran. I suspect this is another acronym... What does it mean?**

Fortran is the short name of "FORMula  
TRANslation", or, if we want to be pedantic, of "IBM  
Mathematical Formula Translation System".

## But what is it?

A programming language.

**» Another programming language?  
There's plenty of them out there!**

Fortran is one of the most venerable high-level programming languages, having been designed in the late 1950s. Fortran is still a widely used and actively supported and developed programming language.

**>> If it was introduced about forty-five years ago, it must have been superseded by now, surely?**

Many programming languages designed at that time have been, but Fortran has not. Its secret resides in the capability of evolving according to the current opinion of what a modern programming language should be. This is the root of its success, which in turn stimulates further evolution.

**>> You are stimulating my curiosity.  
Tell me more!**

To understand the success of Fortran, you have to consider the world of computing as it was around fifty years ago. At that time, computers were synonymous of big mainframes and very special-purpose machines. Programming was then very complicated and far from modern paradigms. Fortran was invented to allow experts in other areas (mainly in physics, engineering and mathematics) to use the power of those devices with a relatively small effort: just few instructions and commands to translate a mathematical problem into machine-executable code to get the result in an unbelievably short interval of time (of course, computers at that time were nowhere as fast as those we are used to nowadays, but their speed was enough to open new perspectives). Fortran became so popular that after a few years almost any computer came with a compiler for that language. However, this had a side effect: a lot of dialects – often incompatible – were born. This incompatibility was not an advantage for the user, nor was it desirable by vendors. It became clear that a standard must have been agreed. This standard, completed in 1972, is known today as 'Fortran 66'. 'Fortran 66' was the first standardised programming language, one of many records held by Fortran.

**>> So, when you say 'Fortran', do you mean 'Fortran 66'?**

No, since Fortran 66 is not the last revision of Fortran. Historically, a very popular one has been (or more properly, 'is') 'Fortran 77' (officially out in 1977). This was a rather conservative revision, originated by the necessity to remove ambiguities from the language and to benefit from advances in the theories of programming. Many programs written in Fortran 77 are still widely used and actively maintained. Much of the popularity of this language is due to its simplicity and efficiency: despite being very easy to learn and use, Fortran 77 allows for hardly rivalled performance.

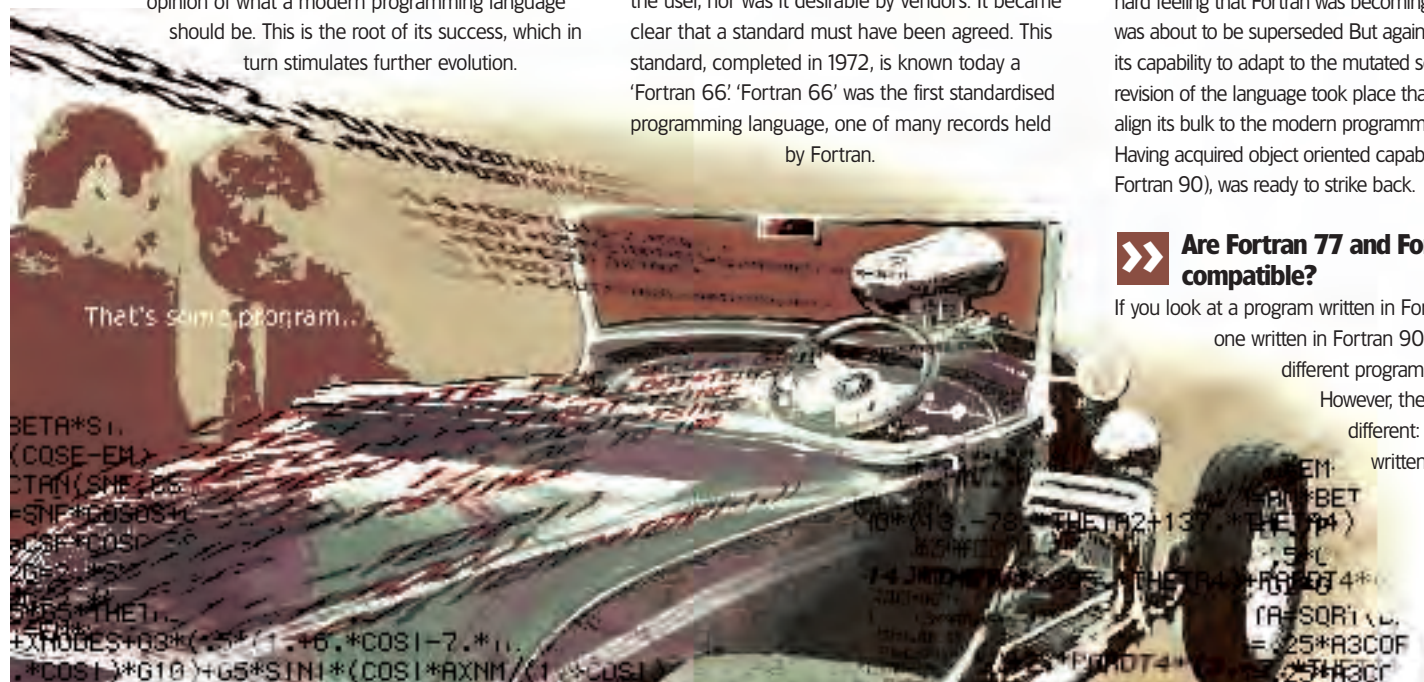
To be fair, Fortran 77 is now used (or should be used) just for legacy purposes: many libraries are written in this language, many man-hours have gone in developing code in Fortran 77, programs are very well tested and efficient, and it would be a waste from several points of view to throw them away.

## »» What has happened in the meanwhile?

To put it simply, evolution. The idea of Object-Oriented Programming (OOP) was one of the biggest breakthroughs in programming; new languages like Ada, Pascal and mainly C++ allowed for slimmer and more elegant coding. For the first time, there was the hard feeling that Fortran was becoming obsolete and was about to be superseded. But again, Fortran showed its capability to adapt to the mutated sensibility: a new revision of the language took place that allowed it to align its bulk to the modern programming paradigms. Having acquired object oriented capabilities, Fortran (or Fortran 90), was ready to strike back.

## Are Fortran 77 and Fortran 90 compatible?

If you look at a program written in Fortran 77 and at one written in Fortran 90, they seem different programming languages. However, the reality is different: a program written in Fortran 77 is





a perfectly legal Fortran 90 program. In this sense, Fortran 90 can be seen as a superset of Fortran 77. This was reckoned necessary because of the vast amount of "legacy code" floating around.

However, there are a few catches. Firstly, a few ambiguities of Fortran 77 have been declared obsolete in Fortran 90 and they should not be used in freshly written programs. Secondly, the standard format of the source programs has been changed. Since one of the requirements of Fortran 90 was backward compatibility with Fortran 77, the result of this is that a legal Fortran 90 source can have two formats: the 'fixed' form (inherited from Fortran 77) and the new 'free' form.

### » Continuity is important. What's the deal with changing the format?

You should remember that Fortran was born nearly fifty years ago and that many characteristics of the language have propagated just for legacy reasons. If you think that in the late 1950s, to write code you just fired up your Emacs under X, think again. Not very far in the past, programmers wrote code on cards by punching little holes on them, compiled the sources by bringing those cards to someone who put them into a special reading machine and went back some time later to collect the results, or (more likely) the errors from the compilation process. When a mistake was discovered, the quickest way to amend it was to cut the card and to replace the wrong code with the correct one (ever wondered where the expression "patching the source code" comes from?) Punching cards had a special format of eighty columns. The last eight columns were unusable and the first six were used for control statements. This is the very same structure that characterises a fixed form source: only seventy-two characters per line are available, of which the first six must be used for special purposes (comments, line continuation and labels). This structure is rather limiting and has been superseded by the free form: now each line can contain up to 132 characters, and the actual code can start on the first column.

### » How is the fixed form distinguished from the free form?

A fixed-form source file must have the suffixes `.f` and `.for`, while for the free form, the suffixes `.f90` and `.f95` have to be used.

### » I can guess the origin of the suffix .90, but where .f95 comes from?

Fortran 90 was followed by Fortran 95 – the current standard. However, Fortran 95 is just a minor revision of Fortran 90, with some obsolescent features removed and a bunch of new statements added.

### » Are there many advantages in using Fortran 90/95 instead of 77?

Quite a few. For a start, you get the flavour of OOP. Then, starting from Fortran 90, new types were defined (among others, allocatable arrays and pointers). Finally, stricter rules of programming were

formulated and unsafe but still legitimate features of Fortran 77 (for example, implicit reshaping of a matrix onto a vector with the same number of entries) were definitely banned. All this for sure encourages cleaner and more reliable programming.

### » What are the Object-Oriented features of Fortran 95?

Fortran 90/95 allows you to define your own data type together with manipulating functions and subroutines, and to pack them into a module for future reusability. The module can be imported by any program via the `USE` statement. Operators can be overloaded. Deeper descriptions of Object Oriented features of Fortran 95 can be found at [www.cs.rpi.edu/~szymansk/oof90.html](http://www.cs.rpi.edu/~szymansk/oof90.html)

### » Many languages have better and cleaner implementations of OOP. Why should I prefer Fortran?

For the speed. Rarely have I seen a well-written Fortran program out-performed by a well-written program in any other programming language.

### » Is then Fortran the best programming language on earth?

Is KDE the best Desktop Environment on Earth?

### » What do you mean?

Programming languages (like many other human devices) are often tools invented for dealing with a problem or a class of problems. Fortran was invented for numerical computations, and in this field it excels. I use it at work and I am pretty happy with the performance I can get out of simple and clean code. But if I had to write a Linux clone I would probably use C, or if I had to write a portable graphical application I would probably use Java.

### » Can I use then Fortran only for numerical simulations?

Fortran can still be used for a variety of purposes: for instance, there are programs around that perform string manipulations written in Fortran.

### » Is there any reason (apart from legacy code) why one could prefer Fortran 77 over Fortran 95?

The use of Fortran 77 for new codes is discouraged. However, there is at least one reason why this could be preferable, and the reason is again speed. To put it simply, the speed at which a code is executed is largely determined by the optimisation that a compiler can perform. Easier structures can be manipulated very easily, while more complicated structures are harder to manipulate. In other words, the more a language is sophisticated and offers high-level structures to simplify the job of the developer, the harder it makes the job of the compiler, which for safety reasons can decide at some point to perform only very trivial optimisations. However, the new





## WHAT ON EARTH Fortran

« features of Fortran 90 were designed in such a way that the most appreciated characteristic of Fortran (speed, to make it clear!) was not sacrificed by the quest for a cleaner language. The result is a good compromise between efficiency and modernity.

### » » 'Efficiency' and 'speed' are words that suggest High Performance Computing.

In fact, Fortran offers several facilities for parallel programming. For instance, the implementation of arrays and relative built-in functions in Fortran 90 were done with parallelism in mind.

### » » How do I write a parallel program in Fortran?

There are several ways. A popular one is High Performance Fortran ([www.crpc.rice.edu/HPFF](http://www.crpc.rice.edu/HPFF)), which is a superset of Fortran 90, explicitly targeting the easy development of parallel apps in Fortran. Similar in scope is OpenMP ([www.openmp.org](http://www.openmp.org)), which also supports C++. Both HPF and OpenMP were made for shared memory systems. On a Beowulf cluster, it makes more sense to use message-passing techniques like MPI. A popular implementation of MPI is *mpich* ([www-unix.mcs.anl.gov/mpi/mpich](http://www-unix.mcs.anl.gov/mpi/mpich)).

### » » Is speed the only reason for the popularity of Fortran for numerical computations?

Fortran was originally designed for numerical computations, and as such it has many efficient built-in functions that speed up the development of numerical code. On top of that, Fortran 90 has simplified the way array operations are performed and has added the possibility of building new types with corresponding manipulating functions, for easier programming. There are many well-tested and fast Fortran libraries in the wild that are a breeze to use for numerical simulations.

### » » Will Fortran be kept aligned to the modern concept in theory of programming?

You can bet on that! In fact, a new revision (at present known as Fortran 2003) is almost complete and should get final approval in early 2004. Fortran 2003 will be a major revision of the standard, substantially larger than Fortran 95 (but not as large as Fortran 90). A list of the improvements include better object management (like for instance allocatable arrays of derived types), a new command line interface and better interoperability with C. See the J3 website ([www.j3-fortran.org](http://www.j3-fortran.org)).

### » » Can I link Fortran and C programs?

Of course! When you build an executable, this does not carry any memory of the programming language used to produce it. But there are a few caveats, like for instance the fact that many compilers append to the names of procedures a final underscore. There is lots of info on how to interface C and Fortran, at [www.absoft.com/wincinter.html](http://www.absoft.com/wincinter.html) for example. Though targeted at Windows users, it discusses general problems.

### » » Who is backing Fortran?

A language does not reach the level of popularity of Fortran without first-class enterprise support (or the other way around, if you prefer). A few companies base their business almost exclusively on Fortran. Many big software vendors (which often, as for instance, in the case of IBM, Sun, SGI and HP/Compaq are also among the biggest hardware vendors) have invested and still keep investing in Fortran. Fortran compilers are provided for virtually any architecture and any operating system (thanks to the existence of a standard, Fortran code is very portable among different processors and different compilers, though some compiler vendor likes to add extensions to the language that can limit portability when used).

As I said earlier, Fortran is widely used in the High Performance Computing world, and it is impossible to think of a Beowulf or a shared memory cluster not equipped with a Fortran compiler. The standard being

in continuous evolution and the language still being very popular, it is very unlikely that Fortran support will be discontinued in the foreseeable future.

### » » Linux and big companies do not always march side by side...

But as far as Fortran is concerned, Linux is very well supported. Fortran has a very strong tradition on Unix systems. Linux is becoming more and more a cheap and efficient replacement of those systems. Moreover, you wouldn't even think of running a long numerical simulation on an OS which has a propensity to throw up a Blue Screen of Death.

Then, it has become natural for many companies to port their Fortran technology to Linux. There are many commercial compilers for Linux. Among them, we mention (in rigorous alphabetical order) *Absoft Pro Fortran*, *Intel Fortran Compiler*, *Lahey-Fujitsu Compiler* and *Portland Group Compiler* (the first two have been reviewed in previous issues of LXF) for the i386 architecture. On other architectures, you may need to use other compilers; for instance, for the alpha processor family there is a Fortran compiler that has been developed by HP/Compaq.

### » » Commercial compilers are expensive and I can't afford paying a license for them.

The *GNU Compiler Collection* (better known as *gcc*) comes with a Fortran 77 compiler. You may also want to check the license agreement of the Intel Fortran Compiler: the chances are that you qualify for a free license.

### » » Is g77 better than Intel's ifc?

Both have advantages and disadvantages. *g77* can run almost on any architecture and any operating system, but is much younger than its cousin *gcc* and is not a central piece of the suite. The Intel compiler is generally faster, but is very specialised to x86 and Itanium.

### » » What about Fortran 90/95?

The Intel Compiler (as well as other commercial compilers) are Fortran 95 compilers. As far as GPL software is concerned, unfortunately the stable branch of *gcc* does not include a Fortran 90/95 compiler. There are however two projects that aim to produce a GPLed Fortran 95 compiler, both at a relatively early stage of development. They are *g95* (<http://g95.sourceforge.net>) and *gcc-g95* (<http://g95.sourceforge.net>). They can work for you.

### » » Why do we have two projects?

The latter is a fork from the former, due to divergences in the objectives among developers. *gcc-g95* aims to integration into the *gcc* family. It will be part of the *gcc* distribution starting from the 3.4 or (more probably) the 3.5 release.





## » How do I have a go with these compilers?

You can download the binaries that you need from the above websites. For *gcc-g95* though, the recommended procedure is to compile the source code yourself. *gcc-g95* is part of the gcc experimental optimisation branch *tree-ssa*. To compile *gcc-g95* you need to get the whole branch (not recommended if you don't have access to a broadband connection!) via anonymous CVS. See the website for more detailed instructions.



## » What is the general structure of a Fortran program?

As programs written in many other languages, a Fortran program is composed by a main program and subprograms (functions and subroutines). Subprograms can be called by the main program or other subprograms. Each self-contained chunk of code (be it the main or a procedure) is composed by a declaring block (where type and dimension of variables to be used are defined) and assignment statements, which form the actual computational part.

Last but not least, a programmer writes some code because she/he wants to manipulate some data in order to obtain a result. Thus every (sub)program will accept some inputs and will return a value, in the form of a variable or a string printed to some output file.

## » Can you give me an example?

Look at the code in the **rectangle.f90** box above right. This computes the area of a rectangle. The first statement assigns a name to the program. The second statement tells the compiler not to accept implicit defined variables. The **REAL ::** statements assign to the variables **a**, **b** and **area** the type **real**. Then the body of the program starts by asking the user to insert the input data, which are stored on the variables **a** and **b**. Finally, the calculation is performed, the computed value is assigned to the variable **area** and the result is printed. Statement following a **!** symbol are ignored till the end of the line (an involved way for saying that comments are defined by a leading **!**). Note:   
**i** Unless the "IMPLICIT NONE" statement is used, variables can be implicitly defined, those starting by **a-h,o-z** being **real** and those starting by **i-m** being **integer** (the use of implicit variables is a bad habit inherited from Fortran 77);   
**ii** Fortran is not case-sensitive (the fact that **Area** has been typed with a leading capital letter in line 11 after having been defined with only lowercase letters does not generate any error, contrary to what would have happened in C, for example); this feature may

seem messy, but if correctly used (not as in our case!) can improve readability of the code.

## » How do I actually compile a Fortran program?

It depends on the compiler you have. Assuming that your compiler is **ifc**, to compile the **rectangle.f90** program listed in the box on the right and call the executable **rectangle** you will issue the command

```
# ifc rectangle.f90 -o rectangle
```

Of course it is also possible to optimise the execution by using specific compiler switches. For instance

```
# ifc -O3 -tpp7 -xW -align -ipo -o rectangle rectangle.f90
```

produces an executable that is optimised for the Pentium4 processor.

## » What development tools do I need and which are available for Linux?

First, you need to write the source code to a file. For this you need an editor, and there are plenty of editors for Linux. An editor supporting syntax highlighting will simplify your job. Then, you need a compiler, and we have already dealt with this issue. Finally you need a good debugger to get your program running the way it is supposed to. *gdb* and *derived* have good Fortran support. If your project explodes in size, then you can use *make* to manage the build process.

## » Are there any IDEs?

Open Source IDEs like *Anjuta*, *Kdevelop* (3.0 beta) and *SourceNavigator* do support Fortran, but unfortunately only Fortran 77. Commercial apps like *CodeForge* often support Fortran 90/95 (and others).

## » Why isn't there any Open Source IDE supporting Fortran 95?

The reason is twofold: on the one hand Fortran 95 is a much more complicated language than Fortran 77; on the other hand, sadly not many programs have been migrated to Fortran 95 (this is the drawback of having backward compatibility). The Fortran 95 niche market is not judged worth investment by developers of those IDEs, who are often interested in other aspects (like simplifying the building process of apps for GNOME and/or KDE, which won't be written in

## rectangle.f90

An example of a FORTRAN program.

```
PROGRAM Rectangle ! Compute the area of a
rectangle
IMPLICIT NONE
REAL :: a, b ! Dimensions
REAL :: area ! Result

! User inputs
PRINT *, 'Write the width and height of the
Rectangle'
READ (*,*) a, b

! Compute the area
Area = a*b

! Print the result
PRINT *, 'The area of this rectangle is', area

END PROGRAM Rectangle
```

Fortran). Anyway, fire up your text editor and then see it for yourself whether there are Open Source IDEs for Fortran 95!

## » Are there automatic tools for converting legacy Fortran 77 code to Fortran 90/95?

There are a few, but generally the conversion will be only syntactical, not lexical. If you really need to convert some code, the best thing to do is to spend some time in porting it. Check [www.nsc.liu.se/~boein/f77to90/f77to90.html](http://www.nsc.liu.se/~boein/f77to90/f77to90.html) for instance.

## » What about Fortran websites?

Of course, the most popular probably being [www.fortran.com](http://www.fortran.com). There you can find tools (some of which are free), links to other sites, training courses etc. Also see [www.fortranlib.com](http://www.fortranlib.com).


## » Where can I get more information about Fortran in general?

You can have a look at the famous Michel Ollagnon's Fortran 90 (indirect) FAQ [www.ifremer.fr/ditigo/molagnon/fortran90/engfaq.html](http://www.ifremer.fr/ditigo/molagnon/fortran90/engfaq.html).

## » Where can I get more information about Fortran on Linux?

[www.nikhef.nl/~templon/fortran.html](http://www.nikhef.nl/~templon/fortran.html) has not been updated recently, but not that much has happened in the meanwhile.

## » I would like to give it a try. Where do I find a good book/tutorial?

There are plenty available on the Net, but my favourite tutorials are those offered by the University of Liverpool: [www.liv.ac.uk/HPC/HTML/FrontPageF90.html](http://www.liv.ac.uk/HPC/HTML/FrontPageF90.html) 

# Tutorials >>

Our experts offer help and opinions on a whole host of Linux applications

## YOUR GUIDE TO GETTING THINGS DONE!

Whether you are just starting out in Linux, or an experienced veteran, there's always more to learn. Every issue of *Linux Format* is packed full of practical advice, and nowhere is it more concentrated than in our tutorials pages.

Here you'll find expert guides to all sorts of things, from Basic Linux usage to understanding and deploying network solutions, from simple script coding to the complexities of Perl regular expressions, Java server apps and more. We aim to bring a good mix of tutorials to each issue, but if you have any suggestions for topics you'd like us to cover, why not contact us, by email at [linuxformat@futurenet.co.uk](mailto:linuxformat@futurenet.co.uk) or by snail mail, or log on to [www.linuxformat.co.uk](http://www.linuxformat.co.uk) and post your suggestions in our special forums? Hope to hear from you soon!

**Nick Veitch** EDITOR

## HOW CODE IS REPRESENTED

Including code in magazines can be tricky, but we hope our notation will help it become clear. When lines are too long for our columns, the remaining text appears on the next line in a solid blue box:

```
procedure
TfrmTextEditor.mniWordWrapClick
(Sender: TObject);
otherwise, there is usually a gap
between lines:
begin
mniWordWrap.Checked := false
end;
Usually, you'll find the code on
our CD/DVD too.
```

## THIS MONTH TEACH YOURSELF...

### Beginners' tutorial

Sound on your Linux box is much easier than you thought! **p62**

### Blender >>

Metaballs and the MakeHuman plugin. PLUS – Show off your skills and win a graphics card! **p66**

### The GIMP

Filter Fantasies Two: more crafty non-destructive ways of tweaking your digital images **p72**

### Practical PHP

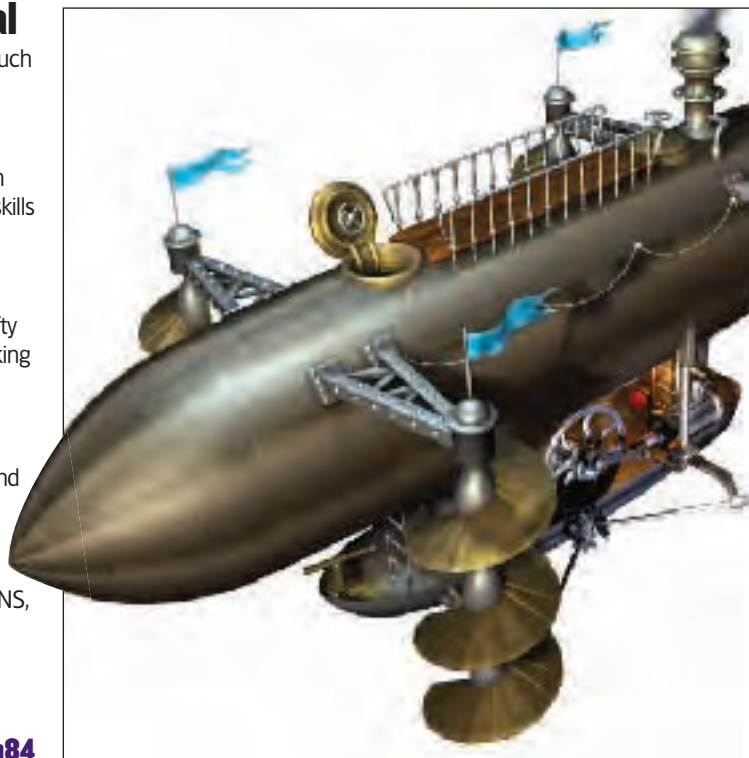
Object-oriented programming, and a further look at PHP 5 **p76**

### TCP/IP and Linux

Making sense of the Internet: DNS, IP addresses and routing **p80**

### Using HTML/CSS

Cascading Style Sheets add sparkle to your HTML pages **p84**



## TIP OF THE MONTH!

Despite Hallmark having such a nice range of cards for Valentine's Day, there's nothing that says "I love you" quite as much as a large box of Godiva chocolates. But (and trust us we often wish otherwise,) this isn't *Chocolate Format*, so we're going to explain how to send your Valentine message using Linux.

Firstly, login to your local server – if you have a mainframe at your University, all the better. If you don't, or if you left school 20 years ago, never fear – any server that's open to a few hundred people should have at least fifty or so logged in at any one time.

## SEND A CHEAP VALENTINE!

Secondly, type **who** to see who's currently logged in, or use **w** if you want the same information as well as to see what everyone is doing (few people, irrespective of how amorous they may be, will appreciate being yanked out of an *Unreal Tournament* frag-fest). If you're on a really big server with people who spend too much time on IRC, a command like:

```
who | grep "sexxychick69"
```

or, if you're female:

```
who | grep "zer0c00l"
```

would save you time hunting through the names. Thirdly, once you've picked your suspect, you need to change your username to something

less obvious than **nick@lxf** – if you have admin privileges, add a user with a romantic name. For bonus mayhem points, wait till the person on the terminal nearest to you wanders off to the bathroom and use **their** login. Type **mesg y** to enable messaging, and you're all set to write.

From the output of **who** you should see what terminal your suspect is on. Using the **write** command, their username, and the terminal, you can send your Valentine message like this: **write <user> <tty>**, eg **write luvrboy19 vc/1** – everything you type before **Ctrl-D** will get sent straight across!



## AUDIO PLAYBACK

# Beginners' Guide to Linux: Sound reproduction & alerts

Sound pervades almost every are of our lives. It can make us cry, lift our mood, mask the incessant hum of a hard disk, and warn you that 'You have spam!' Linux makes using sounds as accompaniment or alert almost effortless, says **Andy Channele**.

**T**his tutorial was going to be brought to you accompanied by the strains of Bach and *The Darkness* – or *The Bachness* if you will... The sounds in question would have been either ripped from my previously purchased CD of *Permission To Land* and stored on the hard disk, or streamed from one of the thousands of Internet broadcasters, but a change in the law means that you should only store uncopyrighted audio material on your PC – see the *You Little Thief* boxout for more information.

But any sound that comes out of your computer's speakers has to get in there somehow. And this tutorial is about how we do it.

## A techno duet

In relation to computers, sound can be broken down into two distinct fields – MIDI and digital audio – both of which have strengths and weaknesses.

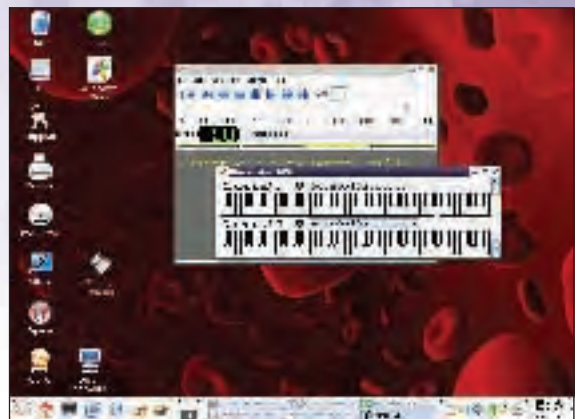
MIDI – which stands for Musical Instrument Digital Interface – is a language that allows various devices to communicate with each other and is a vital part of any modern music studio. As such, it is not particularly relevant to the average computer user, so won't take up too much space here. Briefly, MIDI uses the sounds built into your soundcard, often very short samples of real instruments, to build up music. The music itself is stored as a series of instructions that tell the soundcard which sound is being played and its pitch, duration, velocity (how hard the note is hit) and volume. It can also define effects such as reverb and chorus if your card supports them.

As the music itself is not stored, MIDI files are incredibly small – the complete works of Mozart could be stored on a single floppy disk – and can be 'remixed' using sequencer software such as *Rosegarden* or *Jazz++*.

The disadvantage is that the quality of reproduction when the music is played depends totally on the quality of the soundcard in your PC. The low end of the market is dominated by AC97-compliant integrated chipsets that sound more Bontempi keyboard than Korg, while at the higher end of the market you have card which could actually contain the guts of a complete Korg synthesiser and, as such, sounds indistinguishable from 'the real thing'.

In the middle are cards such as the Creative Labs Live!/Audigy range that come with a basic set of sounds which can be augmented by 'Soundfonts', which usually will have to be loaded into the system manually.

In Mandrake, put the Creative Labs CD in the



...while *KMid* uses the computer's sound hardware to much better effect.

drive, mount it and navigate to /mnt/cdrom/AUDIO/COMMON/SFBANK. The important file in here is called **8MBGMSFX.SF2**. Drag-and-drop this to /home or /usr/share/midi. Now open the Mandrake *Control Center* and install *awesfx* and *awesfx-devel* from your CD. Finally, open a terminal and type:

```
/bin/sfxload /soundfont path/8MBGMSFX.SF2
```

where 'soundfont path' points to wherever you dropped the SF2 file. If you have memory to spare, Creative Labs Live!/Audigy cards can be extended with bigger soundfonts – check out [www.personalcopy.com](http://www.personalcopy.com) for more information and access to some phenomenal, and fabulously large, soundbanks.

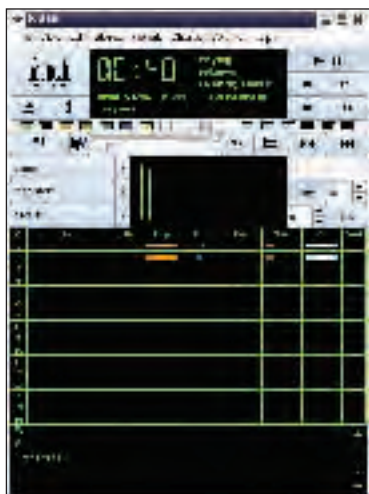
In SUSE you can get the same result entirely from within *YaST*. Open the Hardware>Sound section. If you have more than one soundcard, highlight the Creative Labs one under 'Already configured soundcards' and hit Change. If your card is capable of using them, there will be an 'Install soundfonts' button on the bottom right. Hit that and insert your Creative Labs CD in the drive.

Most distributions automatically configure soundcards so you can begin playing music straight away. To check use *sndconfig* in Red Hat/Fedora, *YaST* in SUSE and *DrakConf* in Mandrake and ensure the card is recognised.

## Playing midifiles

Midifiles are standard files that contain MIDI information capable of being played back on any General MIDI-compatible soundcard, which is just about all of them. You can find midifiles of various descriptions littering the Internet. They can be downloaded just like any other file and played using applications such as *Kmidi*, which uses its own softsynth (and so can sound a little bit

*Kmidi* is a software-based midifile player...



## LINKS

Linux audio resources

[www.vorbis.org](http://www.vorbis.org) Home of the Ogg Vorbis tools including *oggenc*, which you'll need to encode .ogg files.  
[www.shoutcast.com](http://www.shoutcast.com) Finds streams of your favourite type of music.  
<http://lame.sourceforge.net/> Source of the standard MP3 encoder. *LAME* stands for 'LAME Ain't an MP3 Encoder'.  
[www.iccast.org](http://www.iccast.org) Get your own SHOUTcast compatible server.

'choppy' if you're using the PC for other tasks), or *KMid* which offloads all the work onto the sound hardware and is much better if you have a decent soundcard. Both applications work in the same way as an audio program. Load up a file (with a .mid extension) and hit the 'Play' button. The rest of the transport controls work as expected.

If music is your first love, and merely playing midfiles is not good enough, you can use an application called a sequencer to remix them – see *LXF48's Roundup* for more information.

There are quite a few good Open Source sequencers out there, and most of them would require a tutorial of their own. Included with most distributions is *MusE*, a well specified, stable MIDI and audio sequencer that can load and save midfiles. In common with most of these types of applications, *MusE* has a dedicated mixer desk which mimics the desks found in a proper recording studio, allowing you to alter volume and pan, and also adjust effects levels on individual tracks.

Within the confines of a sequencer, MIDI data can be treated just the same as words in a word processor. You can cut, copy and paste and also change the timing or pitch of notes to ensure a perfect performance. It is even possible to record a performance on a MIDI keyboard, and then have the software tighten up your playing using quantization.

## Break it down

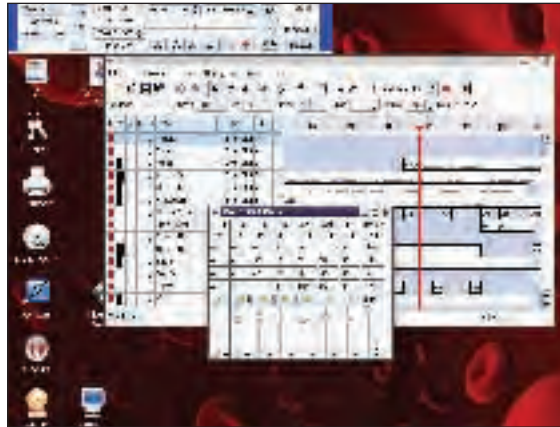
One thing MIDI and soundfonts can't do adequately is capture the fluid dynamics of the performance, say, of a guitarist or drummer. More importantly, a midfile cannot include vocals, which limits their general use. And this is where digital audio or wave files come in.

Sound is basically variations in pressure, or vibrations, in the air. Those vibrations reach your ears and are interpreted by your brain as the sound of a tree falling in a forest, for instance, or Shirley Bassey shrieking at the top of her lungs. But the one defining characteristic of sound is that it is continuous – a smooth wave with peaks and troughs. To capture this wave, computers break it down into small parts taking, in the case of a compact disc, over 44,000 individual 'samples' of the wave per second. This is expressed in the suffix KHz (kilohertz).

To most users 44KHz gives an adequate reproduction of an analogue sound, but it is possible to drive professional audio gear up to 192KHz to capture every nuance of the performance.

There are a number of ways to get audio into a Linux PC. The first, and simplest, is to put a CD in the CD drive of the computer, open the GNOME or KDE CD player, and hit the Play button. Music should emanate from the speakers. This is good, but it relies on you having the disc in the machine at all times.

The second option, then, is to 'rip' the CD onto your hard disk, if your CD is non-copyright, of course! This can be done either with a bespoke application such as *Grip* (included with most distributions), or using a drag-and-drop procedure in *Konqueror*.



*MusE*, a miniature full-featured recording studio on your Linux PC. To rip to MP3 in *Grip*, or other CD ripper, you will need to install *LAME*.

To rip a CD directly from *Konqueror* you'll need to have the correct libraries installed for encoding MP3s or Ogg files. These can be found either on your distribution disc or, as some vendors are not keen on shipping potentially license bearing or patented tools, at their respective websites (see links above left). Once you have these installed, pop a CD in the drive, open *Konqueror* and type in the address bar **audiocd:/** just like a normal URL. *Konqueror* will display a number of files and folders some of which, confusingly, do not yet really exist! You can rip the CD into a collection of .ogg files by opening the Ogg directory and dragging its contents to a new location on your hard disk.



## YOU LITTLE THIEF

EUCD makes MP3 players and copying for own use illegal!

P2P software is the latest 'potentially fatal' threat to the music industry. Having survived the ascent of gramophone records, radio, TV, home taping and CDs – all at some point identified as a killer blow – the music industry, it claims, is being brought to its knees by 12-year-old KaZaA users. Sales are reportedly down, though some industry pundits point to the decline of releases and the rise of the 'now you see 'em, now you don't' *Pop Idol* generation of 'performers'.

To combat the filesharing situation, the music industry acted with lightning speed (it only took them four years!) to set up sites where users could legitimately purchase downloaded music. If you're a Windows or, sometimes, Mac user.

The problem with the legit sites at present is they use very proprietary formats that are Digital Rights Management (DRM) enabled. Microsoft has apparently licensed the DRM in Windows Media Player to an unnamed company that may or may not produce a Linux player, but until that happens Linux users are effectively barred from this market.

The European Union Copyright Directive (EUCD) came into force on 31 November 2003, specifically making uploading to P2P sites like KaZaA and Grokster illegal; and also individuals who make a duplicate of a copyrighted DVD, CD or music file (for their own use, whether for back-up or for use on another device such as an MP3 player) are now committing a crime as well. The EUCD (more formally known as the Directive 2001/29/EC) amends the Copyright Designs and Patents Act of 1988, and has been severely

criticised by civil liberties groups and lawyers for too closely following the controversial 1998 US Digital Millennium Copyright Act, and potentially infringing human rights.

If you contravene the EUCD, theoretically you could face up to two years in jail or an unlimited fine, and risk possible civil action from copyright holders. It will also be against the law for anyone to break anti-copying technologies and publish their findings, as in the 'DVD Jon' case, in which 17-year-old Norwegian programmer Jon Lech Johanson was prosecuted for distributing DeCSS, DVD encryption-cracking software necessary to watch DVD movies on Linux.

The British Phonographic Industry (BPI), the UK equivalent of the Recording Industry Association of America, has always stated that it would wait for the EUCD before deciding whether to take legal action against UK P2P users. At the time of writing, it is still deliberating.

Strangely, these restrictions do not extend to hardware systems that make such illegal actions possible: Amstrad and Sony defeated Universal's efforts to block sales of tape-to-tape cassette decks and video recorders in the 1980s. Maybe in 2004 we'll be treated to the spectacle of Sony Music suing the manufacturing arm of Sony that makes MP3 players? Copying devices these days are usually controlled by their own firmware and/or an app that resides on your PC – another area the law doesn't seem to fully take into account. The issue of streamed media such as Internet radio seems to have escaped the law's attention altogether as it's a broadcasting issue...

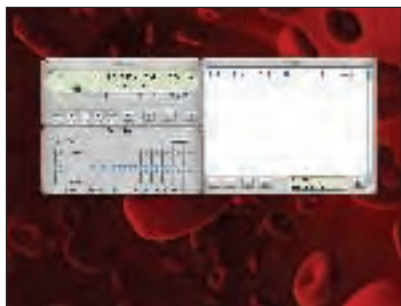


## TUTORIAL Beginners' Linux

Similarly, MP3s can be created by dragging the files from the MP3 folder to a new location. Ripping and encoding can take some time, so sit back and wait.

### Listen!

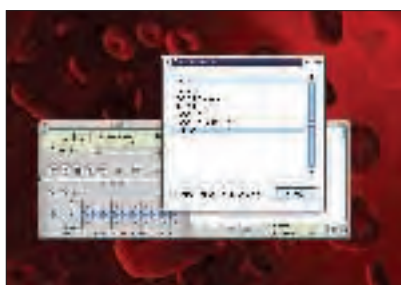
There are loads of applications available for listening back to your efforts, but for the sake of simplicity, we'll look at just one, *XMMS*, in detail with the promise of further coverage of more specialised apps in the future. *XMMS* is a good choice for a basic MP3 player as it doesn't favour one desktop over another and is an excellent all-rounder.



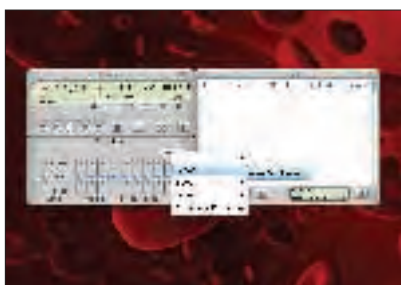
The *XMMS* UI is divided into three areas: main transport controls at top left, a graphic equaliser bottom left and the playlist on the right.



The load files dialog is a familiar affair.



You can use *XMMS* native skins or those designed for *Winamp*.



*XMMS* is able to import graphic equaliser settings from *Winamp* too.

The primary use for *XMMS* is to play songs, in MP3 or OGG format from the hard disk. To do this, simply right click anywhere on the main window to bring up the file menu. From here you can access various options to define how *XMMS* looks and sounds, and you can also select individual files or entire folders to play. Choosing 'Play File' or hit the **L** key, will launch a pretty standard file browser, which can be used to select an individual track or, using **Ctrl** and click, multiple tracks from the same directory. Hit 'OK' and the music will start playing.

Choosing 'Play Directory', or hitting **Shift+L** opens the same file browser, but this time you can select an entire directory to play. *XMMS* will burrow down into sub-directories too, so selecting 'Music' for instance, would begin playing the first song from the first folder in alphabetical order. By right-clicking on the window and selecting Options>Shuffle or hitting the **S** key, you could randomly flit through your whole CD collection without lifting a finger.

*XMMS* will also let you create and save playlists of your favourite music, perhaps to suit a particular mood. The toolbar at the base of the playlist window is used to create, edit, load and save playlists. Alternatively, you can right-click on anywhere inside the window to access all of the tools in a popup menu.

To create a playlist, click on the **+** icon. If you let go immediately the file browser is launched in individual file mode where, as usual, you can **Ctrl-click** for multiple files. However clicking and holding this button provides options to import a directory or URL, which can be used to play media from the Internet. The other buttons on the

toolbar are used to remove files, sort or invert the playlist, provide further information on the current file and load or save lists. The easiest way to organise playing order, though, is simply to drag and drop songs up and down the list – double-clicking a song title will play it.

As well as being compatible with the popular *Winamp* skins – go to [www.winamp.com](http://www.winamp.com) and download a *Winamp* 2 skin to `home/name/.xmms/skins` (enable 'show hidden files' in *Konqueror* first) and select it with Options>Skin browser or **Alt+S** – you can also use *Winamp*'s graphic equaliser presets, if you have *Winamp* installed on a Windows partition. Click on the 'Presets' button in the Equaliser section, choose Import>WinAMP Presets, and navigate to the location of the *Winamp* EQ file – the path is probably something like `/mnt/Windows/Program Files/Winamp/name.EQFXMMS` is the archetypal 'application with hidden depths' and the modular structure of it means there is a lot of extra plugins, to be found at [www.xmms.org](http://www.xmms.org), which extend the features of the player even further.

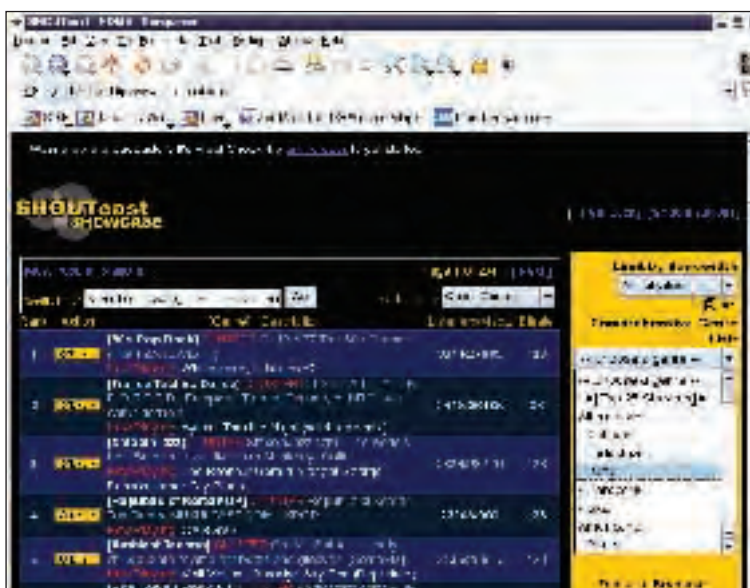
### Aural pleasure to SHOUT about

Another great feature of *XMMS* is the ability to play SHOUTcast streams. SHOUTcast is a system which allows individuals or stations to broadcast programming across the Internet to any compliant player. There are hundreds of stations out there playing everything from 1960s pop and Baroque chamber music to electro-trance or San Francisco punk and all points in between.

The best starting point is [www.shoutcast.com](http://www.shoutcast.com) which lists stations according to popularity, bandwidth (a 128KBps stream is better quality than a 56KBps one) and, crucially, genre.

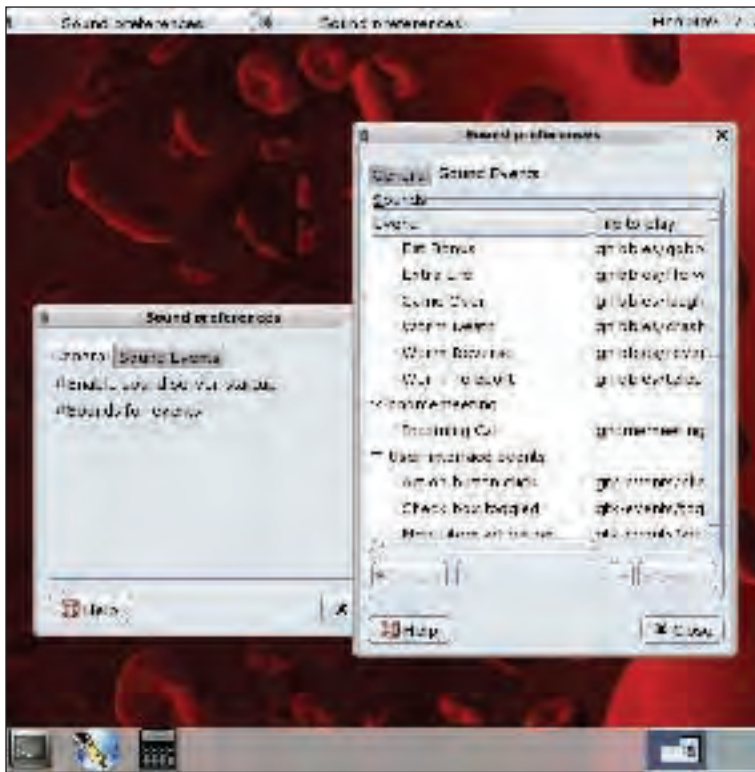
All the Linux browsers come preconfigured to play these streams by opening *XMMS*, so once you've chosen what you want to listen to, hit 'Tune in' and *XMMS* will launch, connect to the stream and start playing. The stream name will also appear in the playlist window and can be saved and loaded just as though it was a single track.

There is an Open Source implementation of SHOUTcast from the same stable as the Ogg Vorbis sound format. Icecast – [www.icecast.org](http://www.icecast.org) – allows users to set up their own SHOUTcast compatible servers capable of streaming content across the Net allowing music fans to share their tastes with others.



SHOUTcast caters for most tastes – whatever part of the world you come from!

## SOUND ALERTS – YOU HAVE SPAM!



Attaching sounds to events is simple in GNOME.

Sound alerts are useful for some things, but if you go overboard they can become a tad annoying. For instance, setting up your mail client so it pings, twangs, or otherwise announces the arrival of some

vital piece of spam is a time-saving device. It tells you 'you have mail' without the need to continually check the mail client.

It is possible to attach noises to many other 'events' in both KDE and GNOME. Beware though, something that sounds reasonable or amusing the first few times you hear it can quickly become infuriating if attached to a common event.

To configure KDE's sounds, go into the KDE *Control Center*, choose 'Sound and Multimedia' and select the 'System Notifications' tab. This is quite a simple dialog, that looks complicated. Just select the application you want to configure from the main drop-down list (at the top), select the action you want to add a sound to, and finally associate the .wav file using the 'Actions' section.

To do the same job in GNOME, you need the Sound Preferences dialog, which will be in either the GNOME *Control Panel* or, in SUSE 9, under the Desktop Preferences menu. Just ensure that both 'Enable sound server startup' and 'Sounds for events' are selected, then attach sounds to events under the 'Sound events' tab. You will see option for system-wide events – dialogs boxes popping up, etc – and there are also some application-specific events definable too. [LXF](http://www.linuxformat.co.uk)

### KMAIL

Email sound alert



In *Kmail*, you can activate this feature by going to Settings>Configure Notifications. In this dialog you can choose an event, in the case of *Kmail* only one event is available, assign a sound to it using the standard file browser and audition sounds with the 'Play' button.

## OPERA M2



Opera's M2 client is an underused part of the suite, but it stands up well to the competition. To set up notification, look under Mail>Manage Accounts, select the appropriate account and hit 'Edit'. You can access the mail notification browser under the 'Incoming' tab.

## MOZILLA THUNDERBIRD



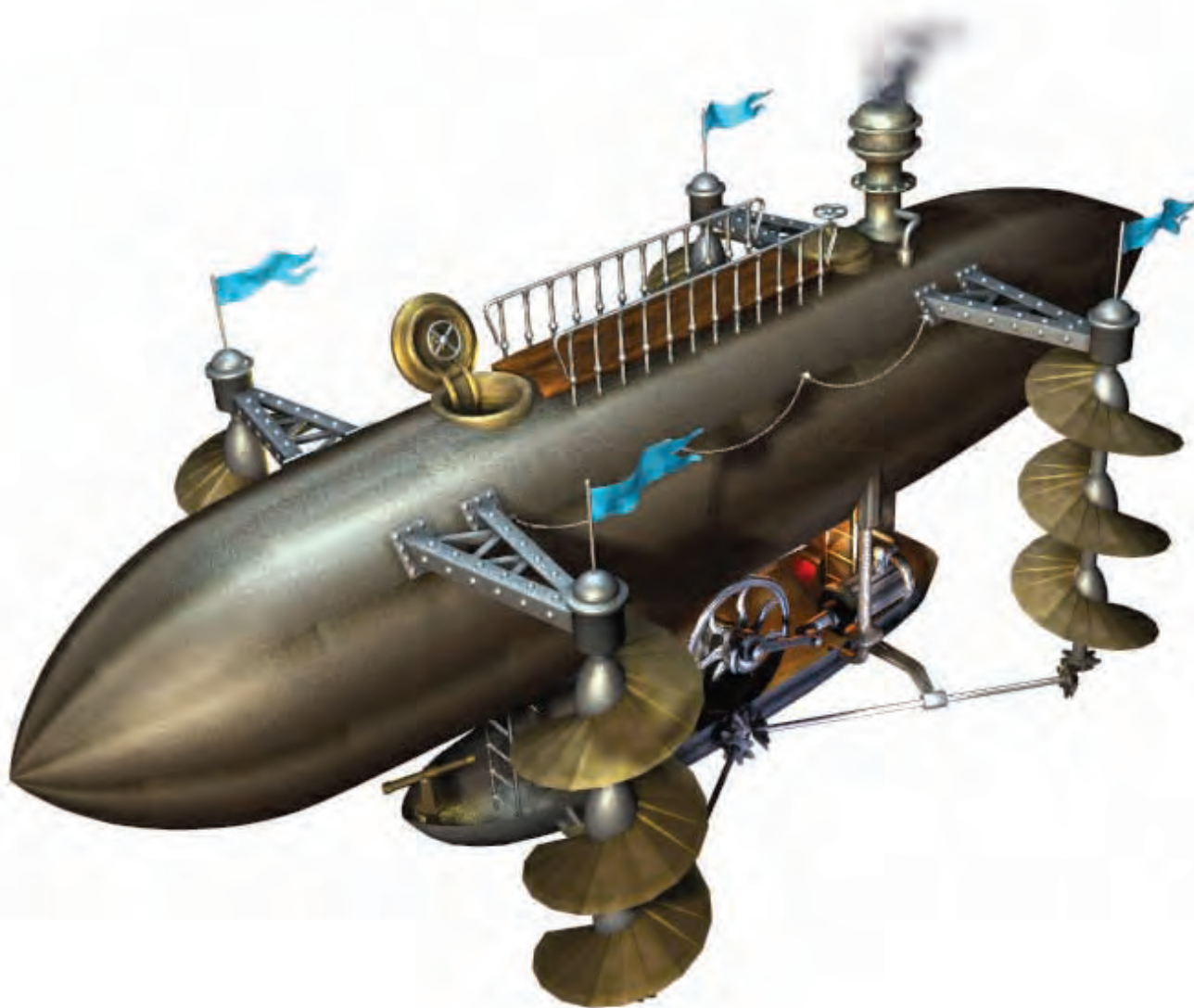
The *Mozilla* mail client can be coaxed into creating a cacophony by going to Tools>Options and looking under the 'General' tab. By default, *Thunderbird* uses a system beep to announce new mail – very early 1980s – but it can set to send forth the sound of your choice by selecting 'Custom .wav file' and then browsing to the correct location.

## XIMIAN EVOLUTION



*Evolution* can be configured to emit any sound when mail arrives, using the Tools>Settings menu entry. Look under the Mail Preferences tab. At the base of the screen is the 'New Mail Notification' section. Select 'Play sound when new mail arrives' and specify the file name using the 'Browse' button.



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## FINISHING TOUCHES

# Blender challenge: Show off your modelling skills



**PART 11** Jono Bacon rounds off *LXF*'s popular 3D modelling series with some final tips and invites you to pit the skills you've learnt against those of other readers...

At some point in a writer's career, they need to say things that they really do not want to say. Unfortunately, I have eloquently arrived at a point where I need to face such a problem and say something I would rather not. This, good readers, is the last part of this *Blender* tutorial marathon that I have been writing for the past eleven months. Since part one, we have covered a huge variety of subjects within Blender. This has included modelling, lighting, materials, textures, animation, bone structures, the game engine, radiosity, atmospheric elements, particle systems, character modelling and many other subjects more esoteric subjects like the *Blender*

game engine. Included with these many subjects we have looked at a variety of examples and cases where we can test our modelling, and in this, the conclusion to our series, we will really be testing your knowledge to see how well you can apply your *Blender* skills in a special *Blender* competition: see the final page of this tutorial for details of how to enter.

To kick this final part off, we will be spreading our wings over six pages rather than the usual four to cover some of the areas that we have not covered much in some of the previous parts. We will also look at a few modelling examples to get you prepared for the competition.

## Spicy Metaballs

One of the most difficult aims when modelling with a 3D package is creating a fluid-looking object. This object is often modelled using a variety of primitives, vertice editing or using special NURBS surfaces (we covered this in the last issue). One other method is to use a special feature called metaballs.

Metaballs are a devilishly simple concept that can have smooth and impressive-looking results. The idea is that you have a number of balls that can be placed next to each other and within each other. What is special about these balls is that they can stick to each other as if they had some kind of magnetic force that actually deforms the ball to stick to another ball. To test this, open up a new scene and remove the default plane. Next, move the camera and select Add>Meta>Ball from the toolbox (**F1**). You will see the ball added, and you can use the middle mouse button (or both mouse buttons pressed) to navigate the 3D view to see the ball at a better angle. Next, move the 3D cursor to another position on the screen and add another ball. If you now select the second ball by right-clicking it, and move it towards the first one, you will see the two balls deform as they are attracted to each other. You can see this kind of effect in **Fig1** above right.

Metaballs are fairly flexible in what you can do with them. You can move and scale them like any other object, and there are also some controls in the Edit buttons that can be used to configure each ball. With a ball selected, you can see that there are Wiresize, Rendersize and Threshold sliders. The Wiresize slider will first let you set the resolution of each ball. A lower setting ensures that the resolution is much higher and therefore you have a smoother ball. The rendersize button essentially does a similar thing as the Wiresize button but for the render process, and the Threshold button controls the 'stickiness' of the metaballs. Experimentation with the Threshold button can create some varied and interesting results. Another slider of interest is the Stiffness control. This slider is often used for controlling the size and density of the object.

With our two metaballs added, we will now go on to add some further shapes. In later versions of *Blender*, some additional types of metaball were added to support different types of shape. This includes metatube, metacube, metaplane and metaellipsoid. If we first add a metacube to the scene, we can position it below the two metaballs. With the metacube we have a number of

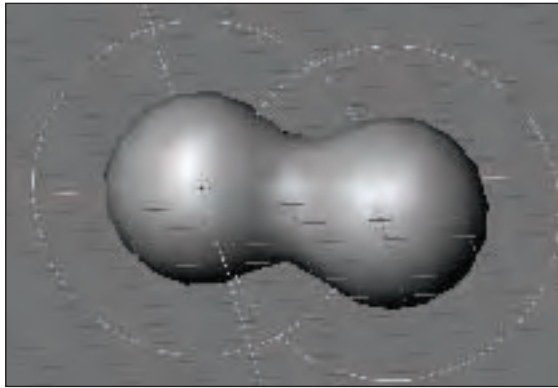


Fig1 Two metaballs attracting to each other.

additional sliders that be used to control the dimensions of the cube. The dx, dy, and dz sliders control the size of the cube along the respective axis. With a few meta objects, we can create quite attractive looking objects such as that shown in **Fig2**.

One interesting feature with these objects is the concept of using invisible metaballs to deform visible metaballs. As an example, if you add a metacube, and resize it so it is a little thinner in the top view, you can then add a metaball, and when the ball is selected, click on the Negative button in the Edit buttons. The ball will go invisible, but you can still see the control outline that can be used to move the ball towards the metacube. With a number of negative objects, the shape can be deformed quite effectively. One useful tip is to use a metatube to cut a hole in an object. This can be seen in **Fig3** overpage. This particular shape uses a few negative metaballs to deform a metacube, and a metatube to cut the hole in the shape.

## Create complexity with dupliframes

One of the problems with 3D modelling is that certain parts of a scene can take a long time to model and shape. This often includes large parts of repetition in creating lots of the same object that occur in a scene.

This can be managed in some situations by duplicating the object and moving it around the scene, but in some cases we can use a more elegant method with Dupliframes. The idea behind Dupliframes is to create a special path in which objects are positioned at equal points. A typical example would be a road. On a road, the streetlights are positioned at equal points down the duration of a portion of road. You can think of the road as the path, and a single lamppost as the dupliframe that we are dealing with.

To get started, first of all create a new scene and remove the default plane and camera. Next, create a bezier curve and keep extruding it until you have a nice long curvy line; this can be used as our path. Now add a single cube and make it thinner so it is more like a flat piece of wood. This will be the shape that we can use to repeat along the path. The first task we need to do is to parent the shape to the path. To do this, select the shape and then hold down the **Shift** key and select the path. To make the path the parent, press **Ctrl-P** and confirm the pop-up window. You will now see a small dotted line connecting the two shapes together. You will now need to select the rectangle shape (right-click the shape to select it, as we currently have both the shape and the path selected) and rotate/move the shape so it is in a correct position to follow the path.

To create the pattern of shapes, we first need to select the path and specify that it is used for dupliframe repetitions. To do this, first select the path by right-clicking it, and then go to the

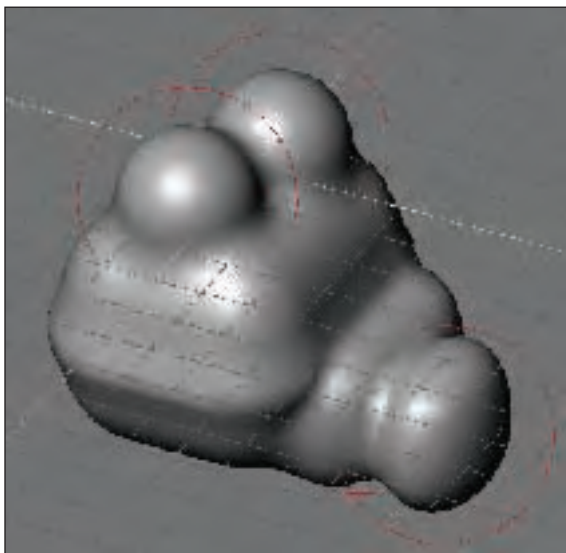
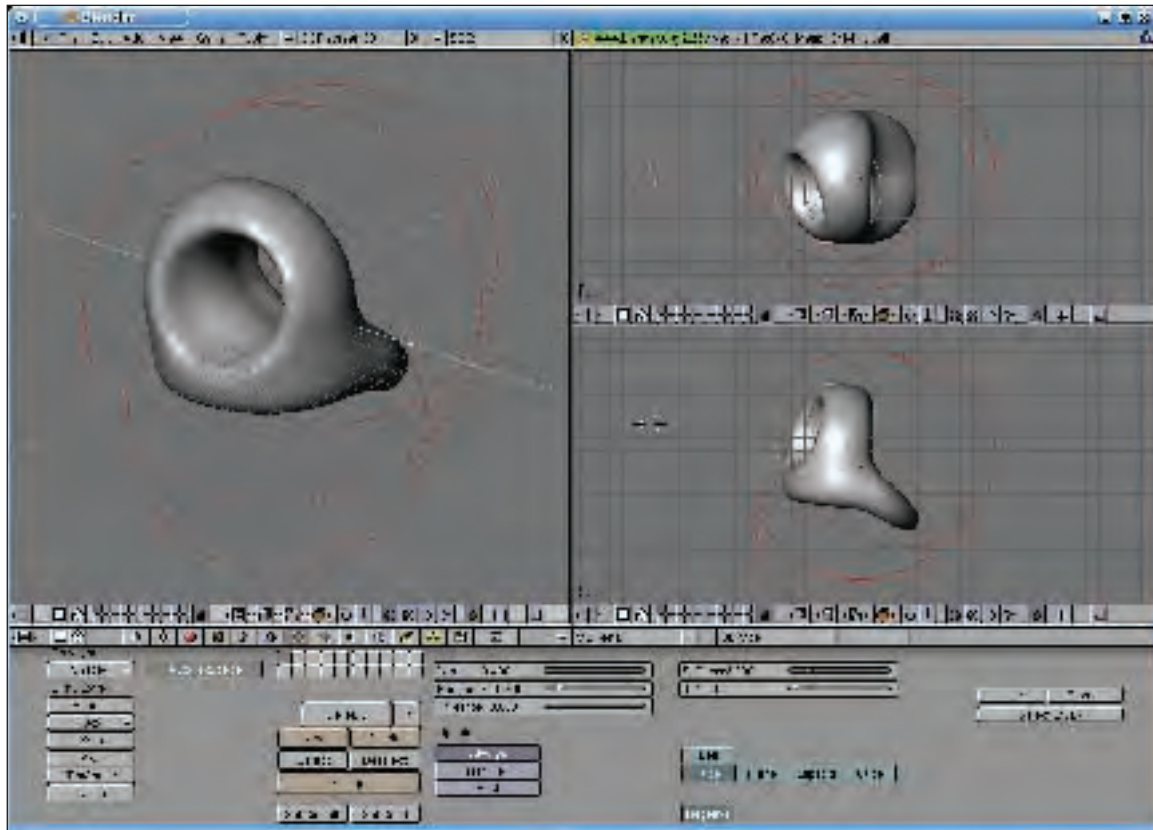


Fig2 Using more metaball shapes.



## TUTORIAL Blender

Fig3 Using negative metaballs to model more complex-looking objects.

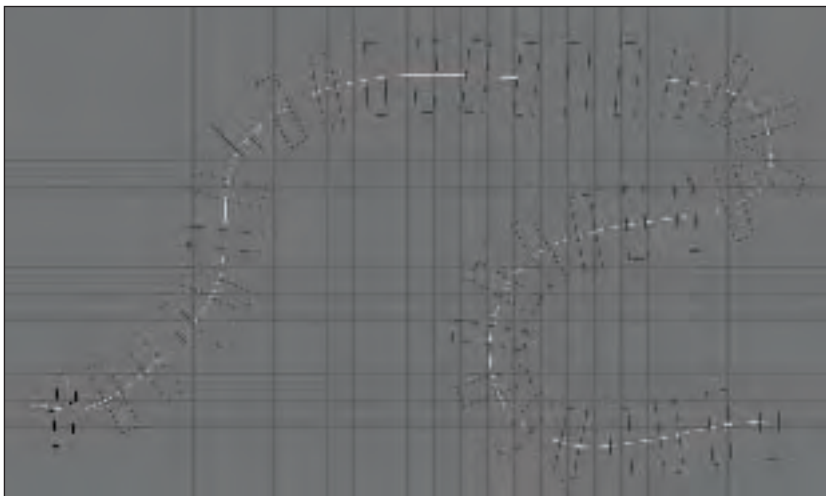


◀ Animation buttons and select the CurvePath and CurveFollow buttons. Next you can right-click the shape (our rectangle in this example) to select it, and then click on the DupliFrames button within the Animation buttons. You will now see the shape repeated across the path.

At this point, you will probably find that there are far too many shapes repeated across the path. You can adjust this by first selecting the path with the right mouse button, and then adjusting the PathLen button. You should have a result that looks somewhat similar to that of **Fig4** below.

One of the nice things about using Dupliframes in your modelling projects is the fact that you can move the path and the shapes will be moved along with it, making it very easy to tweak the overall layout of a scene. You can also set the start and end points of the repeat sequence by adjusting the DupSta and DupEnd sliders.

Fig4 Creating a path of shapes with Dupliframes.



### Python support

One of the most powerful features within blender is its support for running scripts with Python. For those readers who might have been lucky enough to be living under a rock on Mars for the last few years, Python is a general purpose scripting language that can be used for writing special scripts and facilities for developing fine grained control of the objects in *Blender*. One of the most popular uses for the scripting engine has typically been for fine-tuning the behaviour of objects in the game engine. Although flexible for this use, the Python support goes much deeper than this, and there are many scripts that be used within blender to create complex objects easily.

We will be using one of the most popular scripts available for blender called *Make Human*. This special script allows you to create complex human characters easily by using a special command interface. You can issue commands to the interface and each command will adjust the dimensions and figure of your character. There is a great deal of support for fine-tuning specific parts of your character including eyelids and lips.

To use *Make Human*, you will first need to go and download it. You can get it from the project's website at [http://projects.blender.org/project/showfiles.php?group\\_id=16](http://projects.blender.org/project/showfiles.php?group_id=16). You will need to download two files – one is the *Blender* file that you use to create your characters, and the other is the library of templates that are used by *Make Human*. At the current time of writing, the *Make Human*'s developers have not yet finished porting the latest version to Linux, so you will need to download the 1.49 release (the newer version's Linux port may be out by the time you read this). The two files I downloaded were **MH-149.zip** (the *Make Human* project file) and **MH149targetlib.zip** (the templates library). When have downloaded the files, you will need to unzip them into a directory (any directory should be fine, including your home directory):

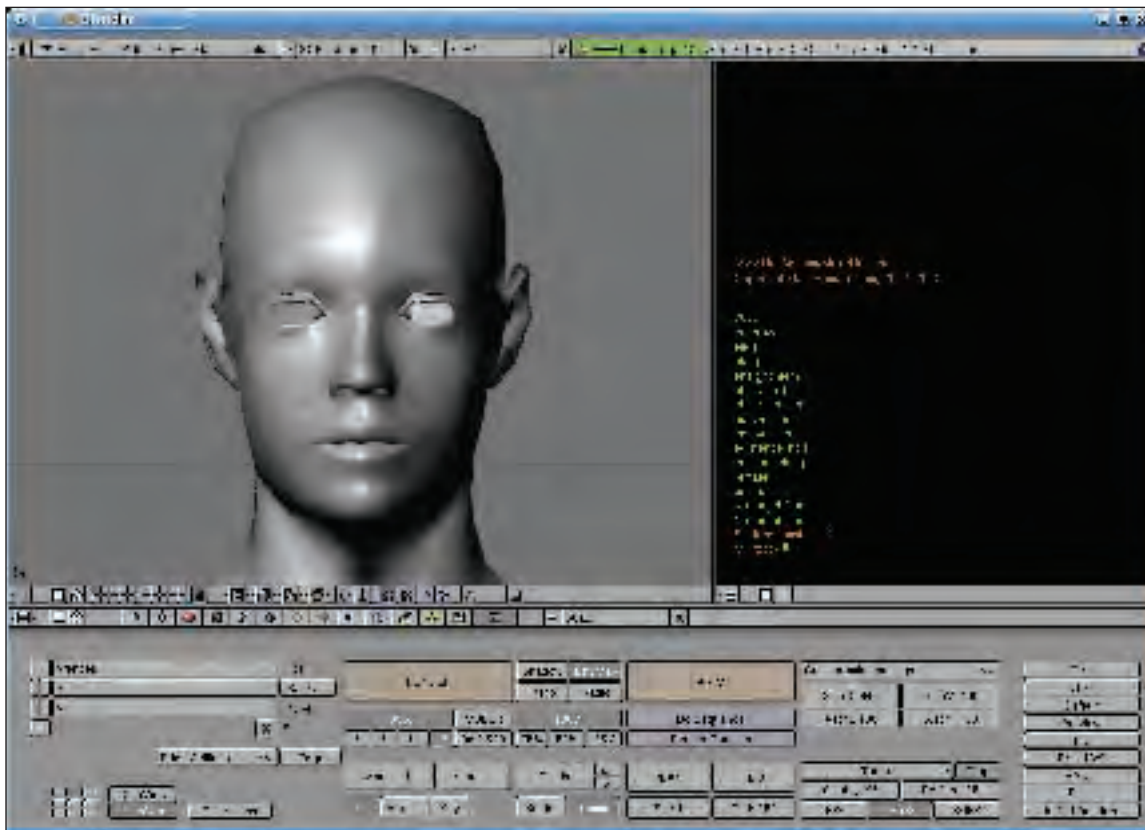


Fig5 Adjusting facial features with Make Human.

unzip MH-149.zip

unzip MH149targetlib.zip

When both of these files have been unzipped, you will have a .blend file and a directory with the target templates in. You can now load the .blend file into *Blender*. When the file has been loaded, you will see a human model in the left side of the window and a Python code listing on the right. Now we need to specify the location of our templates directory. To do this, go back to the shell where you unzipped the files you downloaded, and go into the targetlib directory. Now type

**pwd**

You can copy this location and put it in the code where it says:

**path="....."**

My directory is /home/jono/makehuman/targetlib so I set my path as:

**path="/home/jono/makehuman/targetlib"**

With the path set, we are all set to start using the script. Hover your mouse over the code view and press **Alt-P** and you should see the black console pop up in front of the code view. If you get an error pop up about the script, you may need to fix your python installation.

When the console pops up, it should say that it has loaded the templates successfully. If it does not say this, you will need to double-check the path that we just set. With the console all running correctly and the templates loaded, we can now load the templates by typing:

**load**

You will then see a number of lines that indicates each template being loaded. With these loaded, we are now ready to begin entering commands that will deform and adjust the human in different ways. Each command is generally followed by a size that



## NEW BLENDER MANUAL

Grab yourself a copy and fund the *Blender* Foundation!

One of the most popular products made available by the Blender Foundation has been the ageing manual that was available in book form and then in PDF form when the book stock ran out. Although a great reference, it has dated quite considerably and covers the older interface that was in the 2.0x series of *Blender*.

A new manual has been produced to cover the interface enhancements that have been added to the 2.3x series, and

not only this but the manual has been expanded and increased to nearly 600 pages (the original manual weighed in at approximately 250 pages). In addition to the new topics covered in the manual there is a CD-ROM containing data files and movies, and 16 pages of artwork created by various *Blender* users.

The book is available at [www.blender3d.org/e-shop/product\\_info.php?products\\_id=79](http://www.blender3d.org/e-shop/product_info.php?products_id=79). The price is 44

Euros and by purchasing the book, you will be contributing to the continued development of *Blender*.



Turn the page for details of how to win a copy – or order online and support the project!



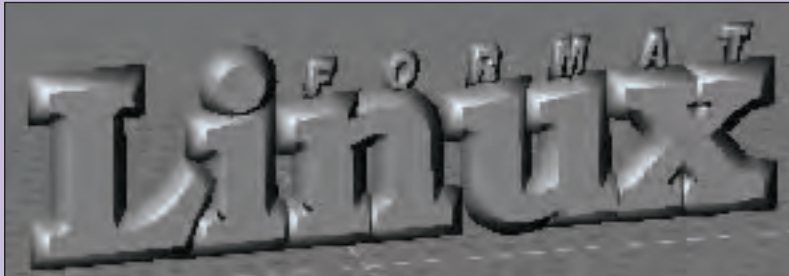
## TUTORIAL Blender

### DEVELOPING A LINUX FORMAT LOGO

Essential competition skills

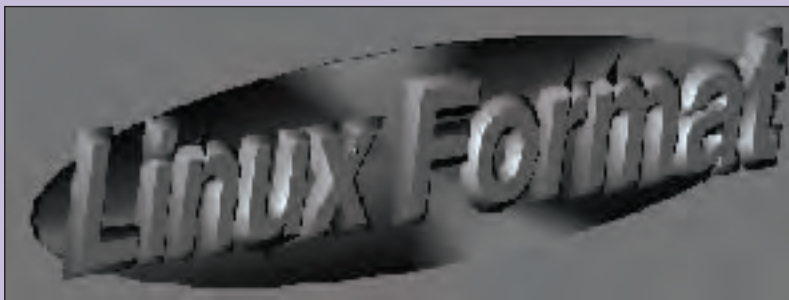
As part of our *Blender* competition detailed opposite, you will need to develop a *Linux Format* logo for your magazine cover. This will involve playing around with some of the text

capabilities with *Blender*, and to give you a head-start, I have come up with three different designs that use some simple techniques within *Blender*.



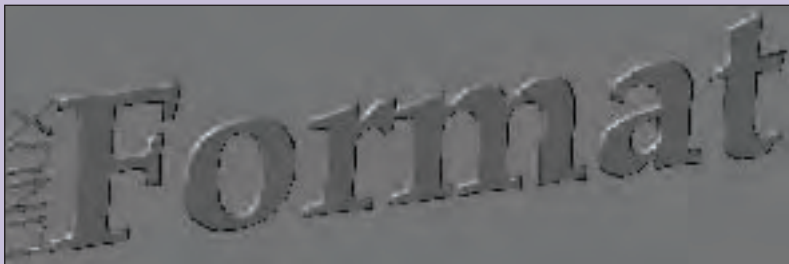
#### Logo 1

This logo was created by taking two different fonts and applying them to the 'Linux' and 'Format' words. The emphasis in this example is the 'Linux' word, and this word is not only larger but also fatter (I used the extrude buttons in the Edit buttons when the text is selected to change this. The 'Format' word is smaller, thinner and spaced out between each letter.



#### Logo 2

This simple design makes use of a single font for the 'Linux Format' words, and I have placed an ellipse behind the words. To create the ellipse, I added a UVSphere, pressed the **S** key to scale it, and then pressed both mouse buttons together to adjust the axis in which the object is scaled. To finish off I just placed the ellipse behind the text.



#### Logo 3

This design is again quite simple and uses a smaller, spaced out 'Linux' position alongside the 'Format' word. Two different font styles have been used and the different words have been extruded slightly. There is also a little bevel on the 'Format' word.

You can see with these three simple designs that some effective layouts can be developed using simple techniques and processes. This is all the layout stage of course, and when you add materials, lights and textures you can create more lively designs. Always remember to pay attention though to the simple aspects in your modelling such as positioning and scaling.

« will indicate how much of a change the command should make to the model. As an example, we will look at some of the commands that we can use to adjust the facial features of our model. Before we do this, you may want to click on the Set Smooth button in the Edit buttons to ensure that the model has a

smoother surface. You can then zoom into the head to get a closer look of the facial features.

We will first change the look of the mouth. To do this, we can use the **mshut** (mouth shut) command. To fully close the mouth we can use a 1.0 value for the command:

```
mshut - 1.0
```

You will see the mouth close after typing the command, and you should see something such as **Fig5**. We can also partially shut the mouth if needed. We can half shut the mouth with a 0.5 value, using the command in this way:

```
mshut - 0.5
```

Next we can adjust the eyes on the head. We can use the **eshut** command to shut the eyes to various levels. We will shut the eyes entirely by setting a 1.0 value:

```
eshut - 1.0
```

In addition to the eyes shutting, we can also adjust the size of our eyelids. You can use the **elids** command:

```
elids - 0.5
```

There are of course many other commands for adjusting the shape and orientation of your character. More information on the list of available commands is at the project's homepage:

[www.dedalo-3d.com/makehuman.html](http://www.dedalo-3d.com/makehuman.html)

### Conclusion

We have covered a lot of ground in using *Blender*, and we have discussed a wealth of different subjects. Although it may be difficult to believe, considering we've written 45+ pages about it over the last year, there are still many areas of *Blender* that have been left untouched and uncovered by this series of tutorials. We have concentrated instead on all of the major areas that are involved in terms of creating models and adding materials/textures and lighting them.

Some of the areas that we have not had space to cover are facilities in *Blender* for creating more expansive projects. An example of this is the Sequence Editor. This part of *Blender* can be used to take a variety of pre-rendered *Blender* animations and lay them out in a non-linear video style. The editor uses the typical timeline format, and you can create edits and sequences right within the blender environment. In addition to this, there is also a Sound Editor that can be used to add sound effects and music to your scenes. The basis of these kinds of editors is to turn *Blender* into a full media production suite as opposed to just a 3D modelling application. There are many examples on the net where these aspects of blender have been demonstrated, such as the many animated shorts that are appearing from various artists.

*Blender* is a powerful tool and has a strong community behind it. The tireless work of Ton Roosendaal and the other developers is taking *Blender* onto higher levels, and many new features are being added to the application all of the time. The newer user interface improvements and additional features are adding to the applicability of blender as a commercial base for 3D graphics, and it would not surprise me if we start seeing more and more *Blender* installations in professional animation studios. This will of course make a market for professional *Blender* artists, and I hope that this series has created a good introduction for many of you.

Have fun with *Blender*, and remember to keep an eye on [www.blender.org/](http://www.blender.org/) for the latest updates and improvements, and we look forward to seeing your submissions for the great *Linux Format Blender Challenge*. Good luck! **LXF**

## THE GREAT LINUX FORMAT BLENDER CHALLENGE

Win a top-notch graphics card in this great modelling competition!

Over the last eleven issues, we have covered many different aspects of using *Blender*, and now is the time to prove your worth as a *Blender* artist. This competition will pit readers against each other to create a compelling image for our competition. The idea is that readers should show as many of their *Blender* skills as possible, and these skills should be combined to create a good looking and effective piece of artwork. Does that sound simple enough?

To make the competition a little more interesting, we will set a task that should be completed by readers. Your brief for this task is:

*Create your own cover for a copy of Linux Format. This cover design can include any kind of artwork that you would like, but must include the Linux Format logo. The Linux Format logo does not need to be represented by the current design, and you can develop a new Linux Format logo for your own magazine cover (as shown opposite).*

As with any competition, there are some rules that govern how the task is judged. The following rules are applied to the competition, and any entries that break these rules will not be judged:

- 1 All entries must be *entirely* modelled in *Blender* by the reader. In addition to rendered artwork, the project .blend file must be submitted with the entry as well.
- 2 No Python scripts are allowed to be used (such as the *Make Human* script). All modelling must be done using the included tools within *Blender*.
- 3 All submissions must be 'clean': any racist, sexist pornographic, or other offensive material (eg libellous to other OSes) will be discarded.
- 4 All submissions must be still images. No animations will be accepted.

In addition to these rules, we have some tips that will help you head in the right direction when developing your entry. It is recommended that you make note of these tips, and ensure that you implement all of them where possible. These tips will help push your entry up to the top of pile of possible winners:



■ The aim of the competition is for you to demonstrate your ability at using *Blender*. To show this, you should use a variety of techniques to create your entry; typically the techniques that have been covered in this series. In addition to the techniques that we have covered in the past 11 issues, it is also recommended that you make use of some additional techniques that are documented on the Internet. Obviously these techniques need to be used in a constructive and attractive way, and just using an additional technique without any kind of artistic motivation will not be regarded as being impressive.

■ When coming up with ideas for your cover, try to be as original as possible. We are not just looking for a thousand different penguin designs and a stock *Linux Format* logo: try to come up with something new and different, concentrating on a particular subject. As an example, if you wanted your subject to be about using *Wine* on Linux, you may have some kind of design based around a wine bottle; or Windows software – Tux posing inside a Windows application etc. The key is to come up with something that looks interesting and gives a clear message. Your entry does not need to have a specific message, but those that do have a particular message or subject are more interesting to the viewer.

■ Humour can be an interesting tool when creating artwork. If you can present your entry so that it looks interesting and makes the judges chuckle, it is more likely to meet with the judges approval. You do not need to use humour of course, and the inverse effect of seriousness and drama can have an equally impressive effect, particularly for business-related subjects.

■ Remember that your submission will not be just judged on your modelling ability, but also on your lighting, materials, textures and setting skills. In many cases, an artist can create an incredible looking model that was lovingly created, but is fundamentally let down by inferior materials and textures. Lighting plays an important part, and you may want to use atmospheric effects such as volumetric lighting and radiosity. Imagination is quite important too!

### Submitting your entry

The deadline for this competition is **APRIL 30 2004**. You will need to *exactly* follow the guidelines below when submitting your artwork:

- When you render your entry, you should use the **FULL** button on the right hand size to set the size of the image. This will create a 1280x1024 full-size image. We will not accept smaller images.
- Your image should be submitted as a JPEG file. We will not accept other types of file format.
- You should ensure that your image is **ONLY** created in *Blender*. Any post-production additions/tweaks with *The GIMP* or *Adobe Photoshop* (or similar) are *not* allowed.
- You must submit **BOTH** your 1280x1024 JPG image **AND** your project .blend file.
- Entries will be judged by a panel consisting of: Julian Jefferson, Art Editor, *Linux Format*; Nick Veitch, Editor, *Linux Format*; and Jono Bacon, writer of this series.
- Please see full list of rules on page 114.

### The prizes

The creator of the best entry will win their artwork printed and framed in a quality presentation frame. In addition, the artwork will be printed in full colour in issue 55 of *Linux Format*. The winner will also get a 128MB Raedon 9600 Pro graphics card, courtesy of the kind folks at Crucial Technology, a copy of the new *Blender 2.30* manual, a *Blender* T-shirt/hat and a copy of the *Blender Textures* CD-ROM.

In addition to the main winner of the competition, we will also have some prizes for two lucky runner-up winners. The second place winner will get a *Blender* T-shirt/hat and a copy of the manual, with their artwork printed in *Linux Format*. The third place winner will get a T-shirt and their artwork printed in *Linux Format*.

Entries can be submitted in two ways: zipped/tarred files will be accepted by email at [lxformat@futurenet.co.uk](mailto:lxformat@futurenet.co.uk) with 'Blender Compo' as the subject-line, or burn your entries to a CD and post them to the address on the Mailserver page (page 12) marked 'Blender Compo'.



## TUTORIAL GIMP



## PHOTO EDITING

# Filter Fantasies: Part 2

While each filter adds its own unique elements to a design, it is the combination of filters that produces something that is uniquely yours, as **Michael J Hammel** shows us.

**T**his issue in part 2 of our look at GIMP filters, we're sticking with options available from the stock set of filters – those every *GIMP* user will have at hand. While these examples are quick and easy, they can all be used to quickly spice up any artwork – many of the tricks discussed here have been used in making the above and previous splash images for this series on *The GIMP*.

And while we're looking at readily available filters, don't forget to check out the *GIMP* Registry and to search the Net for more plugins. There are literally hundreds available for download now, many of which are easily compiled or are supported by the Perl and Script-FU filter interfaces. Additionally, there are collections of these filters already precompiled and ready to install. So be sure to dig around a little once you've mastered today's tutorials.



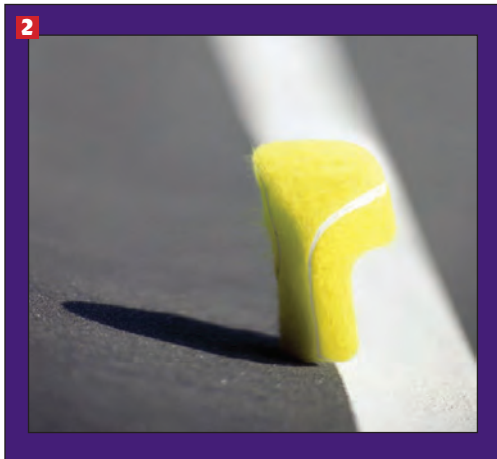
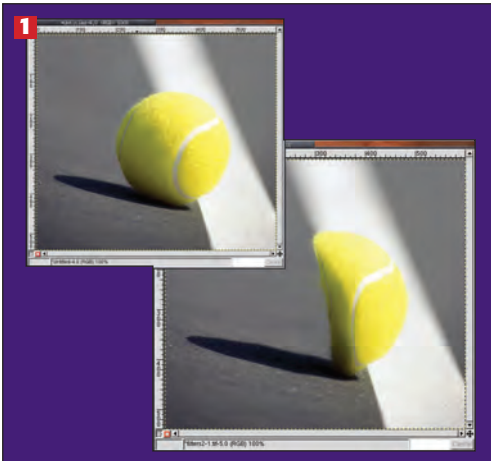
## DRAG AND SCULPT

The *IWarp* plugin may offer one of the most interesting yet least-utilised of all standard *GIMP* filters. Its interactive window allows you to drag the mouse through a preview and deform an image in multiple ways, from shrinking and growing, to moving sections of an image the way a blob of acrylic paint might be spread across a canvas. The problem with *IWarp* is not its ease of use –

it easily stands as one of the most intuitive filters – but rather with what you might do with such a tool. Most warping will be small – changing the shape of someone's nose or ears, for example if you work in fantasy imagery of elves or aliens. But you can also warp objects in ways that might not be easy to do with the real object and too complex to simulate with 3D tools.

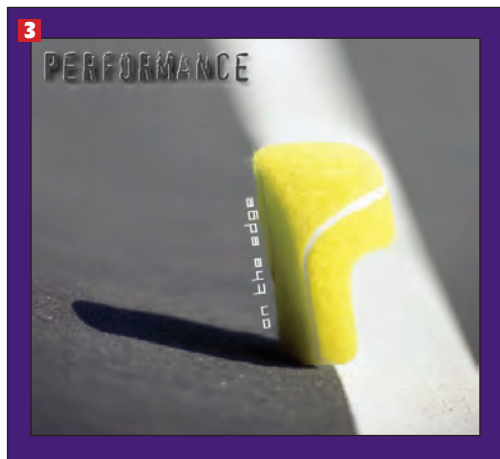
### Flatten left side

**1** This depth of field image allows us to be very creative with the tennis ball. Opening the *IWarp* plugin (Filters>Distorts>*IWarp*), we adjust the deform radius first to a large amount, about 75 (this is in percent of the image or selection area), and the amount to about 50 using a Deform Mode of 'Move'. Dragging in the preview window along the grain of the image, which angles slightly downward from left to right, pull most of the left side of the ball into the centre by starting the drag inside the ball. Choose a starting drag point that is nearer the left side than the centre of the ball – we don't want to disturb any part of the ball to the right of centre. Adjust the 'amount' and 'radius' down with successive drags to fine-tune the deformation. Change the mode to 'Shrink' to merge the seam to the new left edge, if necessary.



### Flatten backside to make half a ball

**2** Repeat the 'Move' mode on the right side dragging up through the white line to push the ball into the shape of a 'P'. By dragging inside the white we can keep the lines appearance intact (it's blurred by the depth of field anyway) and push the ball into the desired shape. Additional pushes are required near the top of the ball, starting just inside its edge, to push the ball to form a distinct square appearance at the upper right of the letter 'P'. Finally, the bottom of the 'P' is pulled down, and very small Move mode pushes are done beneath the letter to merge the shadow and the ground.



### The Letter P

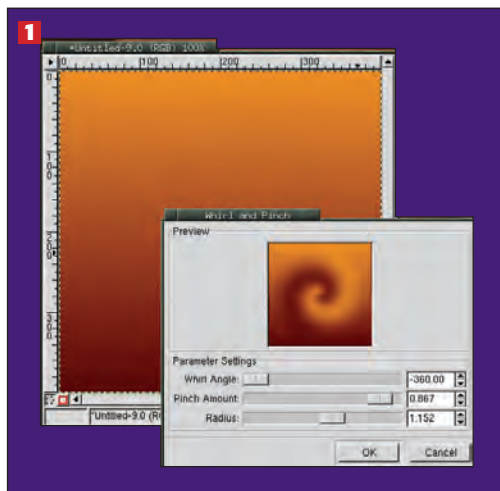
**3** A final bit of adjustment to square off the shadow and the back of the P and we're ready to add some text. The result shows how we can take an ordinary object and convert it quickly into something that might cost much more to produce in real life or take far longer using more complex 3D tools.

## CATCHING A WAVE

This next example is a quickie – making a coloured wave pattern with a grained texture. The simplicity of this process shows how a few filters can make a dramatic impact quickly.

### Gradient

**1** Start with a linear gradient using the foreground and background colours. One of the keys here to make the wave effect stand out is to use high colour contrast between the foreground and background colours. Next, open the Whirl and Pinch filter (Filters>Distorts>Whirl and Pinch). The Whirl Amount sets not only the size of the wave but the direction it breaks. The Pinch amount sets how tight the wave breaks – lower values unroll the wave. The radius sets how much of the image to use in creating the wave.



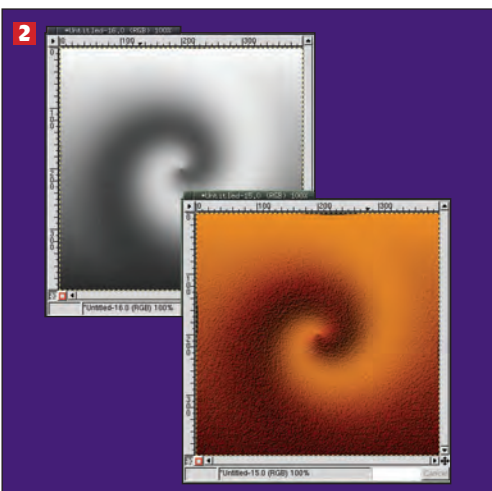


## TUTORIAL GIMP

## << CATCHING A WAVE (CONTINUED)

### Noisify & Bump Map

**2** Duplicate the image with **Ctrl-D**, then desaturate the duplicate. Open the Noisify filter (Filters>Noise>Noisify). Be sure the Independent box is not checked. This will guarantee that the noise will not be coloured. Set the slider down to 0.04 to apply a fairly small amount of noise. The noise will provide texture in the final image. Click on the original image to make it the active image and open the Bump Map filter (Filters>Map>Bump Map). Set the Bump Map image to the desaturated copy and choose appropriate filter settings to bring out the texture in the coloured wave.

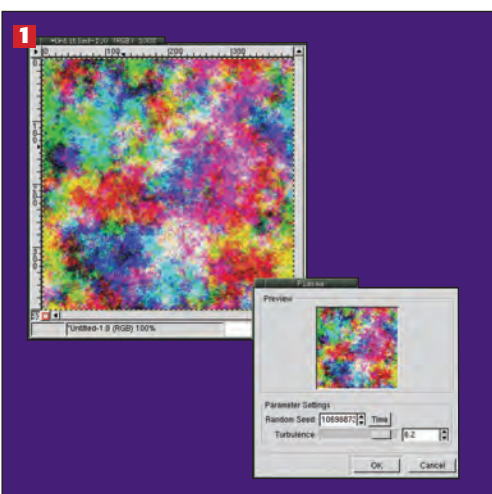


## THE FIRE WITHIN

Another quick but useful effect is fire, or rather a cloud of burning gas. The effect takes only two filters and less than 2 minutes to create. More importantly, with careful use of *IWarp* and some brightness and contrast adjustments, you can convert one such image into a series of moving flames.

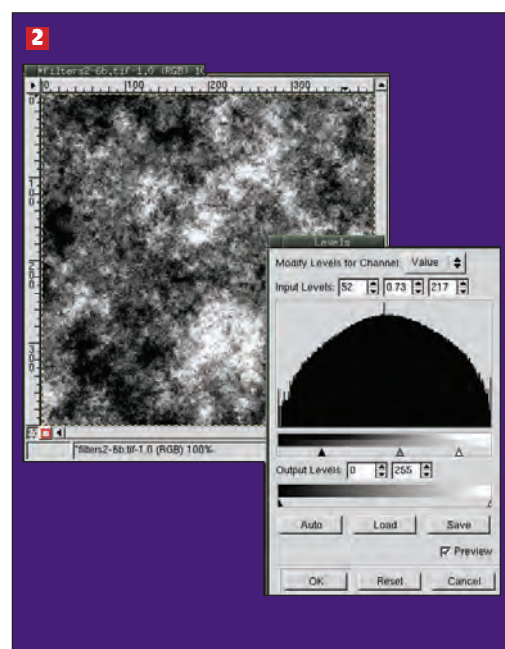
### Plasma

**1** Open a new image window of whatever dimensions you want or need. Render plasma (Filters>Render>Plasma) or solid noise (Filters>Render>Solid Noise) into the window. Plasma works better for this one because it better simulates the random gas look. If plasma is used, desaturate the image. The Plasma plugin renders in colour, whereas Solid Noise renders in black and white, and this effect needs to start with a black and white image.



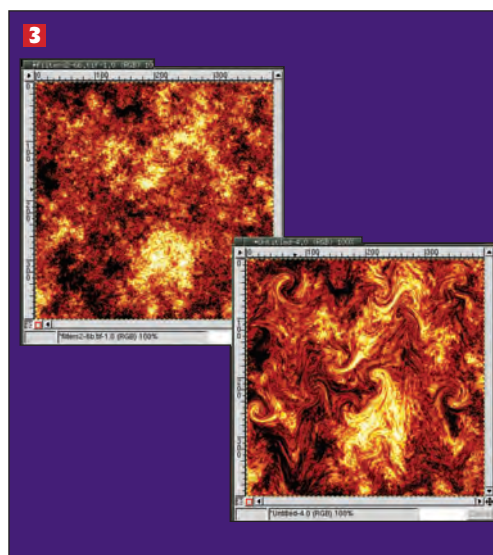
### Gas & Flames

**3** Adjust each of the other channels input levels (using the triangles below the histogram) individually, never closing the filter window until all changes are complete. The actual values will vary. In this example, we set the Red channel input values to 61, 1.94, 207; the Green channel to 72, 0.63, 207; and the Blue channel to 87, 0.26, 234. You can also adjust the output levels, perhaps reducing the amount of green used to bring out more yellow and red. While this image is fine for burning plasma, you can get creative and apply multiple passes of the *IWarp* plugin to create fingered flames, as shown in the second image here.



### Desaturated & Level adjusted

**2** Open the Levels dialog (Image>Colours>Levels). This is the only other filter you need for this effect. The Levels dialog initially shows the histogram for the Value channel. Adjust this channel by moving the black and white triangles on either end of the line below the histogram. Moving the black triangle to the right will increase the contrast of the image, effectively removing some of the clutter in the plasma cloud. Moving the white triangle to the left will also increase the contrast. When adjustments are complete, **DON'T** close the window! Further adjustments can be made to this channel later if needed before applying the changes. Keep in mind that the grey areas of the image will become reddish to yellow and white areas will go from yellow to white, so you have some idea what your image will look like even while its desaturated.

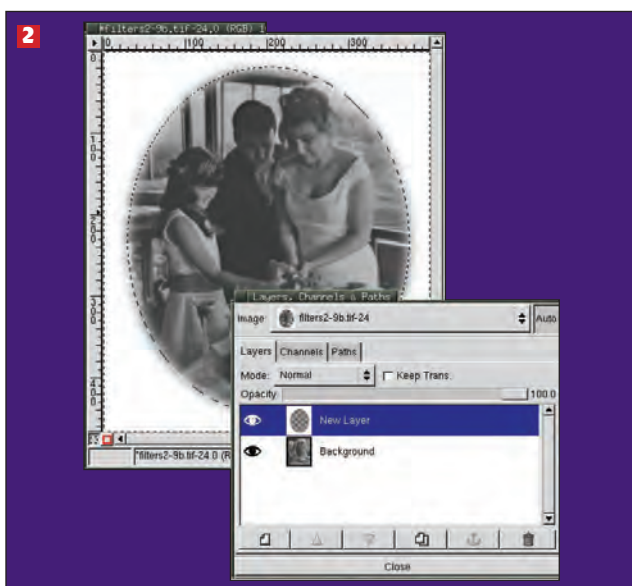
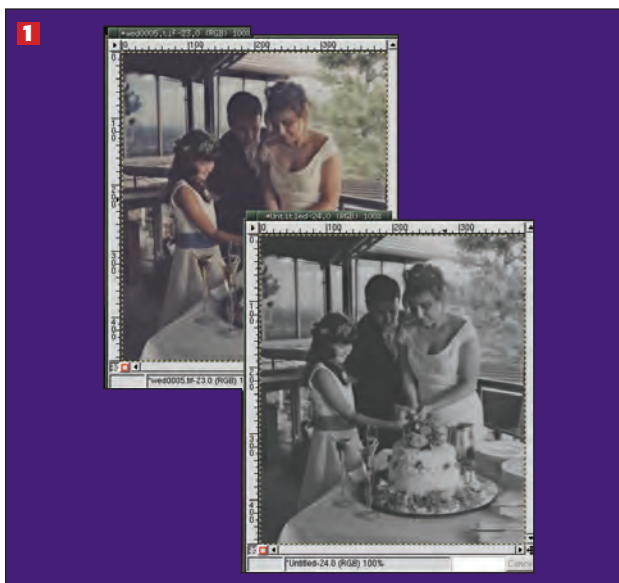


## A BIT OF HISTORY

In this example we'll take an ordinary photo, apply a vignette and age it to make it appear as though it were a photo taken in the late 1800s. Using a photo from an occasion when the subjects are dressed formally helps, as sportswear and other contemporary clothing can spoil the 'authenticity' at a stroke!

### Original image, desaturated

**1** Start with an appropriate photo which, when filtered, would look just as good having come from 100 years in the past as it would from today. A wedding photo often fits this requirement. Scale and centre the subject of the image. Leave plenty of space around the subject in order to create a vignette (a soft round oval that fades into the border). Adjust the levels if necessary to set the white and black points but keep in mind that not adjusting the levels may work even better. Desaturate the image.

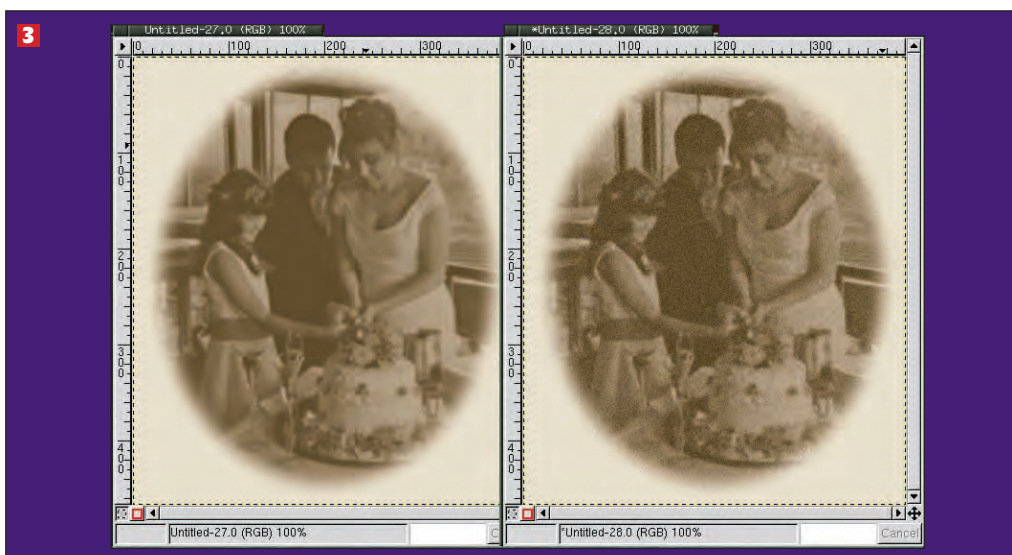


### Vignette

**2** Create an oval selection. Use the **Alt** key (or **Shift-Alt** if **Alt** alone doesn't work) to position the selection around the subject. Feather the selection a relatively large amount. For this roughly 400x500 image, we used feathering of about 25 pixels – you can experiment with different values, as a greater amount of feathering can look good for some images. Invert the selection. Create a new layer and then fill the selection with white. Clear the selection.

### Aged photo & noisified version

**3** Open the Old Photo Script-FU filter. This can be found under Script-FU>Decor in the Canvas menu. Choose Defocus and Sepia from the available options. You might add Mottle as well, but you definitely won't need to add a border – the vignette you just created is border enough – less is more! Apply the filter to a copy of the original. The filter will flatten your image for you (in the copy it creates) so you don't need to flatten it yourself. Be creative if you want – add some stains (Script-FU>Coffee Stains) or noise (Filters>Noise>Noisify) to make the image more grainy. [LXF](#)





PHP VERSION 5

# Practical PHP

Continuing on from the object-orientation discussion from last issue, Paul Hudson looks at magic functions, and a *simple* way to do XML...

Despite devoting a whole four pages to the new OOP features in PHP 5 last issue, there's still quite a bit more we've yet to cover in the form of magic functions, different kinds of class definitions, and also static class variables. The magic functions are designed to providing useful little snippets of functionality to your objects as standard, and give you extra flexibility that would otherwise have been impossible. In addition, PHP 5 allows definition of classes as being abstract and final, as well as giving us static class variables – these are quite in-depth pieces of functionality as OOP goes, so we'll be going over them fairly slowly this issue to make sure it's all understood.

Finally, XML in PHP 5 has been vastly improved so that, finally, it's easy to make use of XML in PHP for every day tasks without needing to write a mountain of code to navigate the DOM tree. As the name implies, the SimpleXML extension makes XML simple, or at least somewhat more simple, which provides yet one more compelling reason to upgrade to PHP 5.

Anyway, enough talking and onto some code – so what are these new magic functions and why do you want them?

## A touch of magic

We looked at some magic functions last month, namely `__toString()`, `__autoload()`, etc. This month we're looking at three magic functions that are somewhat confusing because they are designed to give you maximum flexibility in your scripts, and therefore might seem somewhat vague and even pointless when you first try them out.

The three functions we're interested in are `__get()`, `__set()`, and `__call()`. All three are similar, but `__get()` and `__set()` are

directly related, so we'll look at those two first. Consider the following script:

```
<?php
class car {
    public function __get($var) {
        echo "Getting $var\n";
    }

    public function __set($var, $val) {
        echo "Setting $var to $val\n";
    }
}

$volvo = new car();
$volvo->Name = "Tim";
echo $volvo->Name;
?>
```

Save that as `getset.php` and run it – naturally you'll need to have PHP 5 installed for it to work. The output you should get is this:

```
Setting Name to Tim
Getting Name
```

As you can see, we set the name of the car to **Tim**, then get the name and print it out. Do you see "Tim" being outputted? No. Well, let's take a look at how the scripts works!

The `__get()` magic function takes one parameter, which is the name of the variable to get. This is simple enough, and `__get()` will be called each time we reference a variable\* from our object. Similarly, `__set()` takes the name of the variable to be set as well as the value to set it to, and you can see that working in the

output. So, why doesn't anything actually happen other than the echo statements printing out?

Well, the problem here is that `__get()` and `__set()` only work on variables that are not set. This is why there's an asterisk a couple of sentences ago, next to "each time we reference a variable" – this is really "each time we reference a variable that has not been defined already". You see, `__get()` and `__set()` are designed to handle calls to variables that don't exist, and allow you to override the standard get/set with your own code.

In our example, we set the Name variable of our car object, and, as it doesn't have a Name variable, `__set()` kicks in. This call prints out "Setting name to Tim", but then doesn't do anything about it; the variable doesn't actually get set. The reasoning here is that you can customise the set action so that it does something entirely different – perhaps setting a value in a file rather than creating the object value; the choice is yours. As a result of this, we don't see the object's name being printed out, but we can redo the script to change that, like this:

```
<?php
class car {
    public function __get($var) {
        echo "Getting $var\n";
    }

    public function __set($var, $val) {
        echo "Setting $var to $val\n";
        $this->$var = $val;
    }
}

$volvo = new car();
$volvo->Name = "Tim";
echo $volvo->Name;
?>
```

This time, `__set()` gets the call to set an undefined value, and then carries through by setting it – this makes the script operate quite differently! The output is now this:

```
Setting Name to Tim
Tim
```

This time you can see we have the car's name being outputted properly, but we don't get the message "Getting Name" any more! It's usually around about now that people start thinking they can't win with `__get()` and `__set()`, but hold on while I explain the logic here. Keep in mind that `__get()` and `__set()` only work on variables that aren't defined in the object – by calling `__set()`, and having it actually set the variable, the variable becomes defined in the object. As a result of this, `__set()` no longer works – "Ssss! We always knew these functions were tricky...", as Gollum might say.

## It it helpful?

Now, given that both `__get()` and `__set()` are somewhat evasive, how can they be used for anything interesting and, dare we ask it, useful? This takes some thinking. Given that we're able to do absolutely anything we want when we get and set variables, it's a logical extension to consider making objects more than just temporary script values – making them permanent. This can be achieved by tying our objects into a database system so that as we read and write values, we are in fact working behind the scenes with a database.

If this sounds difficult, you're probably just overestimating the difficulty of these two functions. Log in to your MySQL server, and enter the following commands:

```
USE test;
CREATE TABLE list_of_clowns (Name CHAR(100) PRIMARY
KEY, Age TINYINT, BestTrick CHAR(30));
INSERT INTO list_of_clowns VALUES ('Clinko', 29, 'Juggling');
INSERT INTO list_of_clowns VALUES ('Bobo', 33, 'Pie-
throwing');
INSERT INTO list_of_clowns VALUES ('The Amazing Bobert',
46, 'Car crashing');
```

Here we have a very simple table that contains information on three circus clowns, Clinko, Bobo, and The Amazing Bobert. What we want to do is to be able to create an object in a PHP script that represents one of these clowns, and manipulate the table data using OOP. Note that we are storing the table in the 'test' MySQL database, which should have been created by default when you installed MySQL.

Save this next script as clowns.php:

```
<?php
mysql_connect("localhost", "someuser", "somepass");
mysql_select_db("test");

class clown_db {
    public $Name;

    public function __construct($Name) {
        $this->Name = $Name;
    }

    public function __get($var) {
        $result = mysql_query("SELECT $var FROM list_of_clowns
WHERE Name = '{$this->Name}';");
        if (($result) && mysql_num_rows($result)) {
            extract(mysql_fetch_array($result));
            return $$var;
        }
    }

    public function __set($var, $val) {
        echo "Setting $var to $val\n";

        mysql_query("UPDATE list_of_clowns SET $var = '$val'
WHERE Name = '{$this->Name}';");
    }
}

$clinko = new clown_db("Clinko");
echo "My name is {$clinko->Name} and my age is {$clinko->Age}\n";
?>
```

There's quite a lot of code in there, and you will really need to go and read last issue if you're not sure what `__construct()` is. Here's how the code breaks down:

- A clown class is defined, with a constructor to accept a name. Remember in our table schema we used the clown name as the primary key, so we create the clown giving it the name to use for table lookups.

- The clown class has `__get()` and `__set()` functions in there to look up and set data from the `list_of_clowns` table – these look up and set data by using the primary key to differentiate between clowns. ➤➤



## TUTORIAL PHP

◀ ■ The `__get()` function returns `$$var`, which is a variable variable that should be set to the value we just took out of the database, which `extract()` put into the global scope.

■ We create `$clinko`, a clown, and then get the script to output his (or her?) name and his age.

If you've followed the steps so far, you should get the output "My name is Clinko and my age is 29" – the object is communicating smoothly with the table. The script should work equally well if you change values of `$clinko`.

### Calling the uncallable

In the same way that we have `__get()` and `__set()` to handle variables that don't exist, there is also `__call()` to handle calls to functions that don't exist. In many ways this is even more esoteric than `__get()` and `__set()` and so is equally more difficult to find valid uses for unless you entirely grasp the concept.

Using `__call()` is slightly more tricky than `__get()` and `__set()` because functions are able to take a variable number of parameters as input. As a result, PHP hands you the function that was attempted as the first parameter and the parameters that would have been passed as the second parameter. Give it a try with this implementation of `__call()`:

```
public function __call($function, $args) {
    $args = implode(', ', $args);
    echo "Calling $function with $args\n";
}
```

You can now call any function you like on this object, and, if you haven't already defined it, `__call()` will be used. Of course, that isn't very helpful in its present very simple state – we want to extend this so that using `__call()` will automatically take maximum advantage of our database communication system. One possible implementation is this:

```
public function __call($function, $args) {
    if (count($args) != 2) {
        echo "Not enough arguments passed to $function()!\n";
        return;
    }

    $result = mysql_query("SELECT $function FROM
list_of_clowns WHERE Name = '{$this->Name}'");
    if (($result) && mysql_num_rows($result)) {
        extract(mysql_fetch_array($result));
    }

    $FaveTrick = $$function;
    for ($i = 1; $i <= $args[1]; ++$i) {
        echo "{$this->Name} does his $args[0]: ${$function}!\n";
    }
}
```

This is somewhat complicated to look at, but it's simply designed to take a function name and a set of arguments, and try to make some sense of it. Here's how it might be used:

```
$clinko->BestTrick('favourite trick', 1);
$clinko->BestTrick('most favourite trick', 2);
$clinko->FaveSong('favourite song', 2);
```

As you can see, we're using the undefined functions **BestTrick()** and **FaveSong()**, passing in two parameters each time. So, the first thing that `__call()` does is to bail out if we pass in less than two parameters – this is because we're using it very strictly right now; this might not be an possibility in your situation. Naturally you'll need to add a **FaveSong** field to **list\_of\_clowns** so that the data can be selected back out.

What the `__call()` function above does is take the function name and use that to extract data from the database, use the first parameter as part of the information being outputted, and the second parameter to decide how many times the database information should be echoed out.

So, using the three lines of **BestTrick()**, **BestTrick()**, and **FaveSong()**, we should get the following output:

```
My name is Bobo and my age is 29
Bobo does his favourite trick: Pie-throwing!
Bobo does his most favourite trick: Pie-throwing!
Bobo does his most favourite trick: Pie-throwing!
Bobo does his favourite song: The rain in Spain!
Bobo does his favourite song: The rain in Spain!
```

A fanciful use of `__call()`, perhaps, but you should get the point.

### Abstract art

I promised we'd cover abstract and final classes as well as static class variables, so we're going to cover this relatively simple area as quickly as possible before leaving OOP for good and moving onto the new XML topic. These three are much easier than `__get()`, `__set()`, and `__call()`, thankfully!

Abstract classes are another OOP concept that are there to help you fulfil code contracts. In this case, defining a class as abstract means that it cannot ever be instantiated directly – you can't create objects of this class. This might sound useless at first – after all, where's the point in defining a class you can't create? Well, consider that because OOP models classes after reality, there will be some classes that simply cannot exist if more specific options are available, but are used to define child objects. A class **person**, for example, might define variables such as **Name**, **Age**, etc, and is the basis for classes **man** and **woman**.

## CLASS HINTS

Is PHP a typeless language, or what?

One of the key benefits many programmers cite to writing PHP is that it is typeless – you can multiply a string by a string, or make a string up by adding two integers together. This approach makes learning the language easier, but on the flip-side it does make administering and maintaining the code harder because, in other languages where variables are assigned types, the compiler will warn you about type misuse – a common sign of a programming error.

New in PHP 5 are 'class hints', which allow you to specify what type of object must be passed into a function. For example, if we have a fish class and a submarine class, as well as a global function called **fire\_torpedo()**, we certainly wouldn't want other programmers to try to make a fish fire a torpedo! In this instance, we'd specify that the function must accept a certain type of object, namely only **submarines**, and we'd do it like this:

```
public function fire_torpedo(Submarine $sub) {
    ...
}
```

When this code is executed, PHP will check what goes into **fire\_torpedo()**, and will error out if it's anything but a **submarine** object. Note that this check is done at run-time, when the function is actually called – your script will execute up to a

point, then bail out if it passes in a bad object type. Also note that this check is inheritance-independent – if you specify that a person must be passed in, then pass in a man (a class extended from person), PHP won't complain.

You can do this same check by using a new keyword in PHP 5 – called **instanceof** – which simply returns true if the variable that is on the left of the keyword is of the same class type (or an ancestor of) the class that is on the right of the keyword:

```
<?php
class person { }
class man extends person { }
class cat { }
$foo = new person;
$bar = new man;
$baz = new cat;
echo $foo instanceof person;
echo $bar instanceof person;
echo $baz instanceof person;
?>
```

The output of that script should be "11" – two 1s put together, which means two trues, because **\$foo** is a **person** (it's of class **person**), **\$bar** is a **person** (it's of class **man**, which extends from **person**), and **\$baz** isn't a **person**, because it's a **cat**. Elementary!

This might lead to code like this:

```
$bob = new man;
$freda = new woman;
$jim = new person;
```

This would make **\$bob** male, **\$freda** female, and **\$jim**... well, it would make **\$jim** an "it" – a person without sex. This is of course not possible. The **person** class is important, because we extend it down to man and woman, but we don't want to be able to create a person directly. To do this, we declare person as being abstract, or noncreatable, like this:

```
abstract class person {
...
}
```

Now, attempting to create a person directly (that is, not a man or a woman) will result in a fatal error. Moving on, you can also declare classes as **final**, like this:

```
final class clown_db {
...
}
```

Using **final** on **clown\_db**, we've declared that the **clown\_db** class is our very **final** version of this class and that it cannot be extended further. Adding code like this would cause a fatal error:

```
class new_clown extends clown_db {
...
}
```

Again, this is designed to help you enforce your code contracts. Finally, we have **static** class variables, which are essentially a way of letting objects of the same class share values. Declaring a **static** class variable in your class is a matter of using the **static** keyword, but you can also declare a starting value for it, like this:

```
static public $ThingsDone = 0;
```

We can now make this work by changing the **\_\_call()** function loop to this:

```
echo "{$this->Name} does his $args[0]: ${$function}!\n";
++clown_db::$ThingsDone;
```

The second line there specifies that we increase the static variable **\$ThingsDone** of class **clown\_db** by one. Change the end of the script to this:

```
$clinko->BestTrick('favourite trick', 3);
$clinko->BestTrick('very favourite trick', 3);
$clinko->FaveSong('favourite song', 2);
echo "Actions done in total: ", clown_db::$ThingsDone, "\n";
$bobo = new clown_db("Bobo");
$bobo->BestTrick('favourite trick', 3);
echo "Actions done in total: ", clown_db::$ThingsDone, "\n";
```

That makes the script print out the static class variable after it has been changed by two **clown\_db** objects – if you run the script, you should get 8 the first time, as Clinko did eight things, and 11 the second time, as Bobo did three more things. As you can see, both classes share the same variable, which is somewhat like having a simple global variable to handle it all but a great deal more precise.

## Simple XML?

XML support before PHP 5 was somewhat tricky – you either used an event-based system or a DOM-based system, and neither of these options were easy to learn, or easy to use. PHP 5 comes to the rescue with the new SimpleXML extension, which is designed to convert XML files to usable PHP variables that you can treat like any other PHP variables. This sounds a lot more difficult than it actually is, and the best way to get into it is just to start programming!

Working with XML, requires, unsurprisingly, an XML data file to load from. Here's the XML we'll be using, **lxf50.xml**:

```
<EMPLOYEES>
<EMPLOYEE>
<NAME>Sam</NAME>
<AGE>24</AGE>
</EMPLOYEE>
<EMPLOYEE>
<NAME>Jon</NAME>
<AGE>33</AGE>
</EMPLOYEE>
</EMPLOYEES>
```

Now, to demonstrate how SimpleXML will convert that to variables we can use, try this script out:

```
<?php
$employees = simplexml_load_file('lxf50.xml');
print_r($employees);
?>
```

Give that code a try, and you'll see that SimpleXML has converted all of our XML input file into PHP objects and arrays. Note that it has also kept the letter case information of each XML element, so it's **EMPLOYEE** and **AGE** not **Employee**, etc. This allows us to write code such as this:

```
<?php
$employees = simplexml_load_file('lxf50.xml');
$foo = $employees->EMPLOYEE[0];
echo $foo->NAME;
?>
```

As you can see, **EMPLOYEE** and **NAME** are arrays and variables as you're used to them, so simple XML takes the tricky area of XML and brings it down to a level everyone can use with no retraining required. This simplicity can be extended to strings simply by changing **simplexml\_load\_string()**, which takes the XML string to convert as its parameter, and so is called like this:

```
$employees = simplexml_load_file('<EMPLOYEES>
<EMPLOYEE><NAME>Sam</NAME><AGE>24</AGE>
</EMPLOYEE><EMPLOYEE><NAME>Jon</NAME><AGE>33
</AGE></EMPLOYEE></EMPLOYEES>');


```

This is obviously a bit more difficult to read, particularly in your nicely ordered scripts, but it does mean you can piece together several bits of XML and put them into one SimpleXML object with a single call.

As you can see, SimpleXML is a great new way to get simple XML capabilities into your scripts. However, note that it is just simple stuff – SimpleXML doesn't handle element attributes, such as **<ID TYPE="foo">bar</ID>**, or more complicated things such as schemas or DTDs.

## Conclusion

It took quite a long time to fully explain the new OOP features in PHP 5, and even now there are some that we've had to skip to make enough room to cover SimpleXML. However, you should have a solid enough grounding that the other parts will be relatively easy!

The key advantage to OOP, apart from the obvious one of code re-use, is that it allows you to form code contracts with yourself and other programmers to ensure your classes and objects can only be used as you want them to be – this is a great way to help make your scripts more reliable and more predictable, which means you spend less time hacking, and more time hammering your friends in *Unreal Tournament 2K3*! 

## NEXT MONTH

Next month will be the last PHP 5-focused tutorial, and will cover SQLite, the flat-file database system built into the new release – its unique feature is that you can integrate it very deeply into your PHP scripts. More next issue!



## NAMES AND NAMESPACES

# TCP/IP network infrastructure with Linux

**PART 2** Dr Chris Brown reveals how Linux can make sense of the chaos that is the Internet.



The first part of this series talked about how the Internet works and identified some of its key pieces of infrastructure. This month we're going to look at how some of those components are implemented in Linux.

## The Domain Name Service

One of the most important services we introduced last month was DNS, the Domain Name Service. In case you can't remember back that far, or (heaven forbid!) never read the article in the first place, DNS is the naming service which, among other things, translates machine names like [www.bbc.co.uk](http://www.bbc.co.uk) into IP addresses like 212.58.240.31

## A Hierarchical Namespace

There are an awful lot of computers on the Internet, and they all have unique names. But there is no central registry of all these names. As we saw last month, there is no computer in the world which knows the names of more than a fraction of all the machines on the Internet. So how can we be sure that the names are all different? And, for a given machine name, how on earth does DNS figure out which server knows a machine's address?

DNS divides the total namespace up hierarchically into pieces called 'domains' (**Fig1**). The neat thing about the design is that it allows for the hierarchical delegation of responsibility to chose names, whilst still guaranteeing worldwide uniqueness. For example, there is a top-level domain 'uk' set aside for the United Kingdom. Within the UK, we are free to chose whatever machine names we like, so long as they end in '.uk'. Within the uk domain there is a domain called 'ac.uk' which is set aside for universities and other academic institutions, and within that there are further subdomains with names such as 'hw.ac.uk' (Heriot Watt University, Edinburgh), and 'sheffield.ac.uk' (Sheffield University). The folks at Sheffield can choose any machine names they like within their domain – i.e. names that end in '.sheffield.ac.uk'. The university may choose to divide its own namespace one more level, (probably by department) so that [cs.sheffield.ac.uk](http://cs.sheffield.ac.uk) might be the domain for the computer science department. Within that domain users are free to choose their own machine names: arthur, zaphod, trillian, and so on, thereby identifying themselves as Douglas Adams fans. So, this hierarchical naming scheme gives each machine a globally unique name such as [arthur.cs.sheffield.ac.uk](http://arthur.cs.sheffield.ac.uk); technically called a Fully Qualified Domain Name (FQDN).

The DNS namespace is rather like the hierarchical organisation of the Linux file system. If my home directory is /export/home/chris, for example, I can chose any file names I like, so long as they start with /export/home/chris. Notice, though, that pathnames of files are written in 'big endian' style (ie with the most significant part of the name – /home in this example – first) whereas a DNS name like [arthur.cs.sheffield.ac.uk](http://arthur.cs.sheffield.ac.uk) is written in a 'little endian' style, with the most significant part of the name – uk in this example – last.

There aren't any rules about how many levels deep the naming hierarchy goes. In our example, the machine arthur is five levels deep. It rarely goes much deeper than that. It can be much shallower; for example, [www.ee](http://www.ee) is a web server for Estonia.

This scheme of hierarchically delegating authority to chose names is also the basis for distributing the actual name service across multiple servers. The part of the namespace which a particular server knows about is called a zone. For example, in a simple case Heriot Watt might have one DNS server serving its entire domain; in this case the zone would consist of all the machines in the domain [hw.ac.uk](http://hw.ac.uk). Sheffield, on the other hand, might decide to delegate responsibility for providing name service for the computer science department to that department's own server. In this case, the [sheffield.ac.uk](http://sheffield.ac.uk) domain has two zones, one for everything in [cs.sheffield.ac.uk](http://cs.sheffield.ac.uk) and one for everything else in [sheffield.ac.uk](http://sheffield.ac.uk) (**Fig2**). Each zone has a master server which takes its name-to-address mapping information from files called zone files. It knows about all the machines in its zone, and it knows which DNS servers serve any delegated zones. Because DNS is such a critical service, each zone should have at least one slave server, which periodically updates its zone data from the master server. This updating process is called a zone transfer.

## DNS clients and cervers

The server side of DNS is implemented by an application called *BIND* which stands for *Berkeley Internet Name Domain*. Just to confuse matters further, the name of the actual server is *named*. And by the way, you will disgrace yourself in the eyes of the Linux cognoscenti if you pronounce *named* as in "Our dog is named Rover". It's "name-dee" (a small point, certainly, but one that could lose you street-cred at an interview). BIND has been around a long time and is currently at version 9.2.3. It's shipped as standard with Linux distributions. There isn't really a separate DNS client program, at least not in the same sense that a web browser like *Netscape* is a client of a web server. There is a

### WHAT'S A NAMESPACE?

A 'namespace' just means the set of all possible names that conform to some sort of rule about what a name is. Suppose you were choosing a name for your newborn baby. The set of names you had available to chose from might be considered a namespace. You'd probably want to restrict your choice to a subset of that namespace, say, all girls' names. If you were naming a dog, social conventions suggest the use of a different namespace.

program called *nslookup* which does DNS queries from the command line, but it's mostly used for testing. Instead, the client side of DNS is embodied in functions called resolvers, which are included in any program which needs to do name resolution, such as web browsers, ftp clients, and the like.

Setting up a *BIND* server is moderately complex. There's a configuration file, */etc/named.conf*, to edit, and (if you're configuring a master server) there are the zone files to create and maintain. Like most things in life, except getting pregnant perhaps, it's easier the second time around.

## DNS lookups

Every machine connected to the Internet is provided with the IP address of a (usually local) DNS server. This information is typically supplied by the administrator who installs the system. Usually, a second server is also specified so the machine has something to fall back on if its main server is down. All the hard work of resolving names is done by this local DNS server; the client just sits back and waits for the answer.

How do DNS lookups work? Basically it goes like this. Suppose a machine in a domain somewhere in Canada wants to find the IP address of [arthur.cs.sheffield.ac.uk](http://arthur.cs.sheffield.ac.uk). It will ask its local DNS server, which (initially at least) hasn't the faintest idea about arthur, or about Sheffield University or where the nameserver for the [cs.sheffield.ac.uk](http://cs.sheffield.ac.uk) domain might be. So it will go and ask one of the root name servers. These servers, of which there are about a dozen, are responsible for providing data for the top-level (root) domain. The root servers know where to find nameservers for all the delegated subdomains like *uk* and *fr* and *ca*, and will provide a reply of the form "Go try asking such-and-such (the name server for *.uk*)". In turn, this server will say "Go try asking so-and-so (the name server for *.ac.uk*)", and so on down the hierarchy, until finally our local DNS will get to ask the DNS server for the [cs.sheffield.ac.uk](http://cs.sheffield.ac.uk), which does know about arthur and can return the IP address we're looking for.

In the event that you're actually following all this, you're probably questioning whether it really makes sense for every DNS lookup to have to start at a root name server. Doesn't this

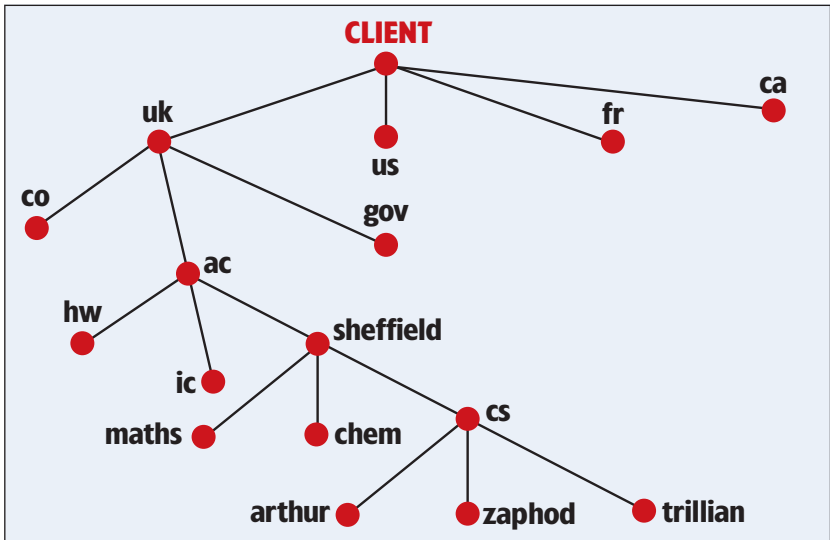


Fig1 The DNS namespace.

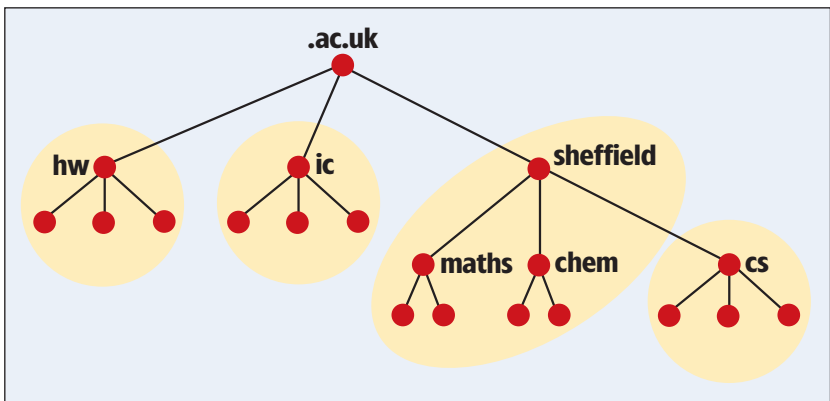


Fig 2 DNS zones. Note that the *cs* subdomain of the [sheffield.ac.uk](http://sheffield.ac.uk) domain is delegated, forming a separate zone.

## A LITTLE KNOWLEDGE GOES A LONG WAY

Messages reach their destination... eventually.

The fact that the Internet hangs together at all is pretty astonishing when you consider how limited and local each machine's knowledge of the network and its topology really is. When thinking about routing, it's tempting to imagine that the sending machine examines a map of the network connectivity and decides what route the message should take. It isn't like that. All that the sending machine knows is an initial place to send the message that, according to its routing tables, ought to work. Each machine just knows where to send it next.

As an analogy, suppose you're trying to find the loo in a crowded restaurant. You'll stand up at your table, hopefully see a sign saying 'toilets', and make your way towards it through the gaps between the tables. Now imagine you were a little child, and couldn't see the sign, or even see over the table tops. You'd need a different strategy. You'd need to ask at each table "Which way's the loo?" and be directed to the next table where you could ask again. You have no idea how many tables you need to go past before you arrive and you're just trusting the folks at each table to send you the right way.

rather destroy the distributed nature of the service? Well, yes, and that's rarely what actually happens, because our local DNS server will have cached (remembered) the addresses of the DNS servers it discovered during the lookup we just described. So for example, if it is subsequently asked for the address of a machine in the *hw.ac.uk* domain, it already knows the address of a server for the *ac.uk* domain, and will start its search from there. Indeed, the local server will also have cached the address for [arthur.cs.sheffield.ac.uk](http://arthur.cs.sheffield.ac.uk), and if it is asked for that machine again it will return the result directly out of the cache. Caching is extremely important in reducing the amount of Internet traffic generated by DNS lookups. But next time you type in some obscure web address to your browser, and it takes a few seconds for the page to start downloading, have a little patience. Your ISP's DNS server has a lot of work to do.

## IP addresses

In the early days of the Internet, IP addresses were assigned to machines on a more-or-less permanent basis. Our machine [arthur.cs.sheffield.ac.uk](http://arthur.cs.sheffield.ac.uk) would have retained the same network configuration (IP address, DNS server, default gateway, etc) for weeks, months, or years. There is still a large part of the Internet which is stable like that. But there is also a growing piece which is much more ephemeral. Laptops, for example, which get lugged around and plugged into corporate networks at a variety of





## TUTORIAL TCP/IP

locations, need a new network configuration at each place. It is not uncommon to see a Product Manager, just arrived in the London office and nicely jet-lagged after his flight from Chicago, prowling round the IS department looking for someone to “get him hooked up” (this usually means to the network, if he was looking for a date he would more likely go to marketing). DHCP removes the need for that. Instead, each corporate network provides a DHCP server that is configured with a pool (i.e. a range) of IP addresses which it will ‘lease out’ to guests.

With our Product Manager’s laptop configured as a DHCP client, all he has to do is plug it in to a network socket and switch

on. When it boots, it is in a total state of ignorance about the network it is connected to. It doesn’t know where to find a DHCP server, or even its own IP address (it may be jet-lagged as well?). So it uses a broadcast to try to locate a server. Effectively this broadcast says “Look, I’m new here, I need someone to tell me my IP address, my subnet mask, my DNS server, my domain name, my default gateway, and where the coffee is.” Hopefully there is a DHCP server listening which will take pity on the newcomer and provide it with the network configuration information it needs. The address which is leased to the client has an expiry time associated with it. This is configurable but it’s usually between an hour and a day. A DHCP client needs to apply to renew the lease if it wants to keep using it after the expiry time. It’s a bit like phoning up to renew your library books.

Broadcasting (ie sending a packet which will be retrieved by every machine on the network) is generally considered antisocial by the TCP/IP community, although a single broadcast by a machine for resource discovery (as in this case) is OK. Some of Microsoft’s protocols, on the other hand, broadcast freely, and without guilt. It’s also important to realise that the broadcast probably won’t make it through any routers, so you have to make sure that every subnet has its own DHCP server listening.

Configuring a machine as a DHCP client is easy, requiring just a one-line entry in the appropriate configuration file. Server configuration is pretty straightforward, too. There a config file (/etc/dhcpd.conf) in which you specify the range of leasable addresses and the other information needed by the client.

Home computers which connect to the Internet by dialling in to an ISP also benefit from DHCP. They need an IP address while they’re connected, but the ISP probably doesn’t want to keep part of his precious address space allocated to machines when they’re not on line.

### PPP: point-to-point protocol

Local Area Networks such as Ethernet, in which all the computers tap into the same transmission medium, are limited in geographic extent, usually spanning a few hundred metres at most. For longer distances (for example, to connect the LAN in the Bristol office with the LAN in the Newcastle office) some form of ‘point-to-point’ connection is used. Point-to-point means what it says – effectively you have a piece of cable with one computer connected to one end, and another computer connected to the other. Similarly, if you connect your computer to the Internet by dialling in to an ISP, you are establishing a point-to-point link (via a modem and a phone line) from your computer to your ISP’s computer. In both cases, the chances are you’re using a protocol called the Point-to-Point protocol (PPP) (Fig3, left). PPP allows IP traffic to be carried over a serial link (it can also carry other protocols such as Novell’s IPX or Appletalk). When a PPP link is established, each end of the link behaves like a network interface. It has its own interface name (usually ppp0) and its own IP address. You can ping the address, send IP datagrams to it, and so on. Apart from the difference in speed, the only difference between a PPP interface and LAN interface is that data sent via a PPP interface has only one place to go – the PPP interface at the other end of the wire.

PPP can also implement authentication (so you know who the guy at the other end of the line is), using the Challenge Handshake Authentication Protocol (CHAP). It would be more accurate to call it the Challenge Response Authentication Protocol but there were a few problems with the acronym...

## SOME USEFUL RESOURCES

Top treeware to help you have a happy network

There are quite a few books around now about Linux networking, and books not specifically about Linux but about network software available for Linux. Here are a few we’ve found useful:

**DNS and BIND Fourth Edition** by Albitz and Liu (O’Reilly, ISBN 0-5960-0158-4)

Make sure you get the fourth edition, which covers BIND 9.

**UNIX System Administration Handbook Third Edition**, by Nemeth, Snider, Seebas and Hein (Prentice Hall, ISBN 0-1302-0601-6)

This book isn’t specifically about networking and it isn’t specifically about Linux, although Red Hat is one of the four platforms the book covers in detail. What makes this book good is the real-

world experience of the authors. It’s not just a ‘how to’ book but a ‘why to’ book as well.

**Linux Network Administrator’s Guide Second Edition**, by Kirch and Dawson (O’Reilly, ISBN 1-5659-2400-2)

Quite a lot of the content of this book is available (for free) in the various HOW-TO documents included with Linux, but the book is easier to read in bed.

**Linux Deployment** by Prasad et al. (Wrox Press, ISBN 1-8610-0287-4)

A slightly eclectic mix of topics, as you always get with author-per-chapter compilations like this. But there are some excellent overviews of Linux’s role in networking and more detailed chapters on topics such as setting up a firewall.

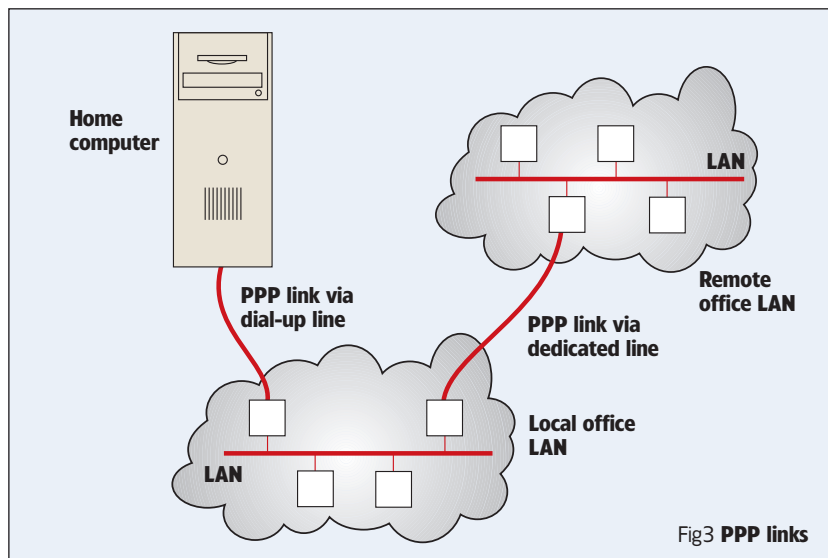


Fig3 PPP links

## ON THE NAMING OF SERVICES

Tradition will out...

There’s a long-standing UNIX tradition (inherited, by Linux) that the names of server programs are derived by taking the name of the service and sticking a ‘d’ on the end; for example *named* and *pppd* which we’ve just met; there’s also *ftpd* which is the ftp server, *routed* which is a routing server (surprisingly), and many others. The ‘d’ simply stands for daemon,

used in its old sense of ‘an attendant or indwelling spirit’.

Hence the soothsayer’s line to Mark Antony in Act 2 Scene 3 of Shakespeare’s *Antony and Cleopatra*: “Thy daemon, that’s thy spirit which keeps thee, is Noble, courageous high, unmatchable”. UNIX experts are not in agreement over which daemon Mark Antony actually wrote.

Under Linux, ppp is partly implemented within a kernel module and partly using a server called *pppd*. There isn't a client side to ppp; both ends of the link run *pppd* – it's a true 'peer-to-peer' relationship.

## Routing

We discussed routing a bit in the last article. To recap, LAN technologies such as Ethernet can only deliver datagrams to machines on the same physical network. To reach other networks, the datagrams have to be sent to, and forwarded, by machines called routers. In the UNIX/Linux world, a general-purpose machine configured to route packets is often referred to as a gateway.

Routers are the very stuff of which the Internet is made, and companies like Cisco do good business selling them. But you can construct an extremely capable router with a Linux box at much lower cost. Any Linux system which has more than one network interface can act as a router, even if one of those interfaces is a PPP link. However, you have to explicitly enable IP forwarding in the Linux kernel. This typically requires a one-line change in the appropriate system configuration file. The only other thing you need to do is to put some entries into the routing table and – hey presto – a router!

Putting entries into the routing table turns out to be the hard part. In fact, although the term 'routing' strictly refers to the process of deciding how to forward datagrams, the word is also used to describe the whole business of managing the routing table.

## The routing table

The routing table, maintained by the Linux kernel, contains a list of entries which look like:

**"To reach network x, send the datagram to IP address y"**

There are also things called "host specific" entries, which look something like:

**"To reach host h, send the datagram to IP address z"**

Finally, there is always a default route, which effectively says:

**"In the absence of any more specific instructions, send the datagram to IP address z"**

Indeed, for most machines connected on a LAN, a default route is all that is necessary.

The routing decisions for IP datagrams are based on the destination address of the datagram and the entries in the routing table. The decision logic is shown in **Fig4**. Note that the IP software makes a totally separate routing decision for every single datagram that comes along. There is no concept of a 'connection', where the routing gets figured out once and for all when the connection is established.

The simplest way to put entries into the routing table is with the 'route add' command. For example:

```
route add -net 184.6.19.0 gw 184.6.20.200
```

adds a route to the network 184.6.19.0 via the host (gateway) 184.6.20.200

Routes added in this way are called static routes – they'll stay in the routing table until explicitly deleted. For relatively small, stable internetworks, static routes are sufficient. For more richly connected machines out in the volatile world of the Internet, routes are likely to change often enough that manually managed static routes are not convenient.

There are a number of routing protocols which can be used to enable computers to exchange routing information and update the routing tables dynamically. The idea is to seed the network

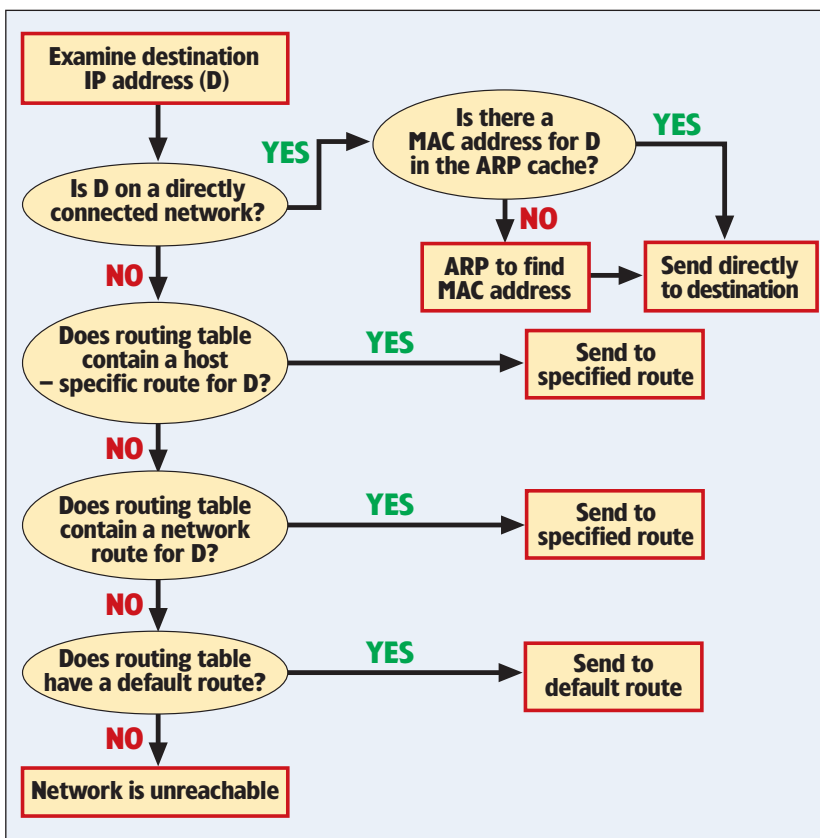


Fig 4 IP routing decisions

with routing information via a number of static routes, then let the computers put their heads together to figure the bigger picture out for themselves. This turns out to be an extraordinarily difficult task, and quite a number of different algorithms, protocols, and routing daemons have been developed over the years. Two are dominant in the Linux world – *routerd*, which implements a protocol called Routing Interchange Protocol (RIP) and *gated*, which implements a protocol called Open Shortest Path First (OSPF). For more on routers, see *Linux Routers: A Primer for Network Administrators* by Tony Mancill (Prentice Hall, ISBN 0-1308-6113-8).

## Virtual Interfaces

We've just got space to quickly describe one more feature of Linux which is extremely useful in providing network services. Linux can assign multiple IP addresses to a single physical network interface. These additional interfaces are called "virtual interfaces", and the trick is sometimes referred to as IP aliasing. If the primary interface is called *eth0* (the usual name for an ethernet adaptor) then the virtual interfaces will be called *eth0:0*, *eth0:1*, and so on. You can have hundreds of these virtual interfaces on a single machine. Why would you want to do this? Well, for example, it's common for a web hosting company to host multiple sites on one machine. Each site will want its own domain name and its own IP address. Virtual Interfaces provides a simple and effective solution. **LXF**

## NEXT MONTH

In the next part of this series, we'll look at one final piece of infrastructure – the firewall, and then go on to survey a few application services, including ftp, mail, and of course, web service.

## THE AUTHOR

**D. Chris Brown** is a freelance consultant specialising in UNIX and Linux systems. His first contact with UNIX was in 1979, the year he oiled his first teletype. He was the founding chairman of the Sun UK User Group and for several years a Research Fellow at Sheffield University where he worked on the development of large-scale parallel computing systems for machine vision applications. More recently he has worked extensively on implementing the design, development, and delivery of Unix and Linux training for the training company Learning Tree International. Chris can be reached at: [chrisbrown230@aol.com](mailto:chrisbrown230@aol.com)





## WEB PROGRAMMING

# Using HTML/CSS with Linux

**PART 3** In our final part of our mini-exploration of HTML and CSS, Jono Bacon gets exotic with CSS.

Many people underestimate Cascading Style Sheets (CSS). Those of you who have been following this short series will be aware that CSS allows you to style various portions of your web page, but many think that this just refers to setting the background colour and maybe underlining some text. Many of us fall into this assumption when we begin learning CSS, and I can categorically say that this limited assumption of what CSS can do is simply not the case.

Within the CSS standards are encased an incredible number of features that will allow your pages to be styled and formatted in a huge number of ways. In this issue we will be looking at some of these different features and exploring different ways in which we can format a variety of HTML elements such as text, buttons, select boxes and more. CSS is such a large standard that we will not have time to cover all of the elements and options, so it is also recommended that you look at the CSS documentation that is available at [www.w3c.org/Style/CSS/](http://www.w3c.org/Style/CSS/).

## Linking to CSS files

In the last issue we started using CSS by including the CSS definitions within our HTML files. The problem with this is that if you want the same design across a number of pages, you would need to copy the block of CSS into each file. This goes against the grain and intention of CSS, and CSS was originally intended to have a single CSS file that can be linked to a number of HTML pages. Although I included the CSS inline for ease of demonstrating CSS, in real projects it is advised that you link to an external file.

To link to a separate CSS file, you will first need to put your CSS definitions in a normal file. This file should end in the extension .css (such as stylesheet.css) and should not have any HTML tags in there and just the CSS code. To do this you can cut all the CSS definitions that appear between the `<style>` tags and put them in this separate file. To link to the file, you need to put this line in the `<head>` section of your HTML file:

```
<link href="stylesheet.css" rel="stylesheet">
```

With this line added, the stylesheet will be loaded and applied to the HTML file the line is in. This means that you can apply a

standard style across a number of HTML files by including this line in each file. The benefit of this use of CSS is that you can change the entire style of your website by just changing the contents of your CSS file. This makes style and design changes quick and easy.

## Styling text

Possibly the most common type of information on a web page is text. Text is not only important to transmit the information that you want to express, but is also important in the design considerations for your site. CSS has a number of features and definitions that can tune the text on your page, and these primarily deal with the font, size and colour of the text. To first change the font and colour we can use the font-family and colour definitions:

```
font-family: verdana,geneva,arial,helvetica,sans-serif;
color: #999999;
```

The size of the text can be dictated by using the font-size definition:

```
font-size: 10px;
```

The px part of the value refers to the size in pixels. Although our text has been basically styled, there are other definitions that can further help us get our design looking good. First we can apply some letter spacing to our text. This will put a small gap in between each letter in the text and create a nice effect. To do this we use **letter-spacing**:

```
letter-spacing: 5px;
```

A useful CSS definition for adding text effects is **text-decoration**. We can use this definition to set **underline**, **line-through** and **overline** effects on the text:

```
text-decoration: overline;
text-decoration: line-through;
text-decoration: underline;
```

With our text formatted, we can next align our text with **text-align**:

```
text-align: center;
text-align: left;
text-align: right;
```

One important factor when dealing with text is determining what area of text will be formatted. As an example, you may put

your text in a `<div>` tag and then apply the formatting to the `<div>`. Another text block that can be formatted is a paragraph by using the `<p>` tag:

```
<p>
This is a text paragraph. This typical paragraph can be used to
separate chunks of text in the same way that paragraphs are
used in normal stories.
</p>
<p>
Here is a second paragraph. Pretty nifty eh? OK, yes I know it
isn't really.
</p>
```

With the paragraph block, we can add a few other useful text formatting techniques. The first technique is to indent the first line of the paragraph (a common formatting technique in books and essays). This can be done with **text-indent**:

```
text-indent: 5px;
```

Another technique is adjusting the case of the paragraph to upper and lower case:

```
text-transform: uppercase;
```

```
text-transform: lowercase;
```

```
text-transform: capitalise;
```

## Formatting tables

Tables are containers for information, and we discussed how to create tables in the first part of the series. CSS offers a number of features relating to tables, and we can create some quite attractive effects with these features. Tables are generally formatted by applying CSS definitions to the different table tags and what they do. As an example, if you want to apply formatting to the entire table, you can apply your CSS definitions to the `<table>` tag. If you want to just apply CSS to a single cell, you can apply it to a `<td>` tag.

To begin with, we will use the following table:

```
<table>
<tr>
  <td>Name</td>
  <td>Bob Smith</td>
</tr>
<tr>
  <td>Age</td>
  <td>55</td>
</tr>
<tr>
  <td>Address</td>
  <td>25, The Grove, Bobtown, Bobshire</td>
</tr>
</table>
```

The first set of CSS definitions that we can apply to the table are for the entire table structure. These definitions can be applied to the `<table>` tag. We will first set the border colour, type and thickness. This will provide a border that will go around the outer edge of the table. This border can be controlled with the **border-top**, **border-bottom**, **border-left** and **border-right** definitions. As an example, we can make the top border of the table have a thick black line:

```
border-top: thick solid black;
```

This definition has three parts. The first part (**thick**) refers to the thickness of the border. This is commonly set to either thick or thin. The next part refers to the type of border. Here we are using the **solid** type (a continuous unbroken line), but you can also set this part to the properties shown in the *Setting Borders* box below left. The **black** part should be self-explanatory.

Not only can you apply these borders to your designs, but you can also apply the text formatting definitions that we discussed earlier. As an example, if you are including text in a table cell (as is commonly done with tables), you can use the alignment CSS definitions to ensure that you have your text centered or left/right aligned in each cell. You could also apply the colour formatting commands to the left column in our table. We will look at a few examples of formatting our table. First we will add some class references to our table:

```
<table class="maintable">
<tr>
  <td class="left">Name</td>
  <td>Bob Smith</td>
</tr>
<tr>
  <td class="left">Age</td>
  <td>55</td>
</tr>
<tr>
  <td class="left">Address</td>
  <td>25, The Grove, Bobtown, Bobshire</td>
</tr>
</table>
```

As you can see, we have two types of class – a **maintable** (applied to a `<table>` tag) and a **left** (applied to a `<td>` tag) definition. We will first create a nice blue-looking table as shown overpage. The CSS for this table is below:

```
table.maintable
{
  font-family: verdana, geneva, arial, helvetica, sans-serif;
  font-size: 14px;
  color: #A18AFF;
```



## SETTING BORDERS

The commands

Give your borders different appearances by varying the definition explained above left with these commands:

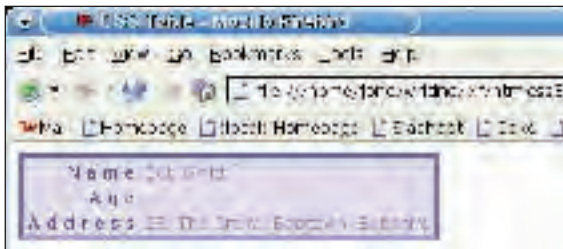
<b>none</b>	No border. This value forces the computed value of 'border-width' to be '0'.
<b>hidden</b>	Same as 'none', except in terms of border conflict resolution for table elements.
<b>dotted</b>	The border is a series of dots.
<b>dashed</b>	The border is a series of short line segments.
<b>solid</b>	The border is a single line segment.
<b>double</b>	The border is two solid lines. The sum of the two lines and the space between them equals the value of 'border-width'.
<b>groove</b>	The border looks as though it were embossed or carved into the canvas.
<b>ridge</b>	The opposite of 'groove': the border looks as though it were coming out of the canvas.
<b>inset</b>	The border makes the entire box look as though it were embedded in the canvas.
<b>outset</b>	The opposite of 'inset': the border makes the entire box look as though it were coming out of the canvas.

(Taken from the CSS guidelines at <http://www.w3.org/TR/REC-CSS2/box.html#border-shorthand-properties>)



## TUTORIAL HTML & CSS

Fig1 A nice blue table styled with CSS.



```

<< background-color: #E1DCFF;
border-top: thick solid #405DFF;
border-left: thick solid #7173FF;
border-right: thick solid #7173FF;
border-bottom: thick solid #9BA2FF;
}

td.left
{
color: #2226FF;
text-align: right;
letter-spacing: 5px;
font-weight: bold;
}

```

This table is shown in **Fig1**. With this design we have changed the colour of each of the borders so that the borders get slightly lighter in colour from top to bottom. This gives a nice effect of giving the table a slight shading. We have also added some letter spacing and right alignment on the left column. We will now change the entire table CSS definition and go for a different, more 3D look:

```

table.maintable
{
font-family: verdana, geneva, arial, helvetica, sans-serif;
font-size: 14px;
color: #000000;
background-color: #D9D9D9;
border-top: 10px ridge #000000;

```

```

border-left: 5px solid #000000;
border-right: 5px solid #000000;
border-bottom: 5px ridge #000000;
}

td.left
{
color: #595959;
text-align: right;
letter-spacing: 0px;
text-transform: uppercase;
font-weight: bold;
}

```

You can see this design in **Fig2**. With this design we have made use of a ridge border type for the **border-top** and **border-bottom** definitions. When we combine this ridge type with the solid border type for the border-left and border-right definitions we can get a 3D effect. The other feature of this design is that we have made the **left** column text **uppercase** and changed the colours to give a more attractive appearance overall.

### Styling forms

Forms are an essential part of any web development. We have not yet covered forms in this series, so we will first have a quick rundown of what they are and what they can do for us. We will then look at how to style them using CSS.

Forms are a method of getting input from the user. A form will contain a number of controls that can be used for the user to type in some information that can then be processed later. A typical example of a form would be if you were to type in your name and address for registering with a website. You would type your details into a series of text boxes, and you would also use controls to select items (such as your job, or your gender). These controls also have a button add the bottom of the form (usually with the word Submit on it) that can be used to send the information you typed in to the website.

We will first create a simple form for typing in your name and selecting your favourite Linux application. Before we begin, we need to specify where the form starts and ends. This is done with the **<form>** tag. This tag will be just outside your form control tags. Below is our form code:

```

<form>
<table cellspacing="5">
<tr>
<td>Your name</td>
<td><input id="textbox" type="text" name="myBox"
value=""></td>
</tr>
<tr>
<td>Fave Linux application</td>
<td>

```



Fig2 A 3D table design styled with CSS.

## USE THE ZEN

Mellowing out with CSS

One of the most impressive websites on the Internet in terms of CSS design and layout is without a doubt the CSS Zen Garden. This incredible site allows designers to take a standard set of text and links and style them using just CSS. The result of this site is a number of professional designs that have been developed to really show the capabilities and features of CSS.

The CSS Zen Garden not only shows how good CSS can be used to develop a design for your website, but it also makes the code available that was used to create the designs on the site. Using this resource, you can now learn from how the professional designers do it and see their own



stylesheets. This is the way I learned how to code with CSS and it has an impressive impact on getting something up and running quickly for your own pages.

It is highly recommended that you visit [www.csszengarden.com/](http://www.csszengarden.com/) if you're learning CSS.

```

<select>
  <optgroup id="option">
    <option>Linux</option>
    <option>Samba</option>
    <option>Mozilla</option>
    <option>Quanta</option>
    <option>Blender</option>
    <option>KDE</option>
    <option>GNOME</option>
    <option>Sodipodi</option>
    <option>GIMP</option>
  </optgroup>
</select>
</td>
</tr>
</table>

<input id="pb" type="button" name="myButton"
value="Send us your details!">

</form>

```

The first part of this code starts our form block and then we create table in which to lay out our form. The first form element is:

```
<input id="textbox" type="text" name="myBox" value="">
```

This line created a text box. The control will allow your user to type something in the box. There are many different types of control, and each generally uses the **<input>** tag to create it. You then specify the type of control with the type attribute (here we select a text box with the **text** value). Each control should also have a name and can also have a value. The name attribute is used so the box can be referenced later (with PHP/Javascript etc), and the value attribute lets you put some text in the box when the page is loaded. We do not want any text, so the value attribute is empty.

The next control is the select box. To use this drop down control, we create a **<select>** block and each item is within an **<option>** tag. We also include an **<optgroup>** tag to style these options later. The final control is similar to the previous **<input>** line, but we are using the **button** type. This creates a normal push button.

Styling these form elements is done in a completely similar way to other CSS styling. We can first style the text box by using some definitions that should be familiar to you by now:

```

#textbox
{
  background-color: #ffffff;
}

```

## ONWARDS WITH CSS

To further your knowledge of CSS, it is recommended that you have a look at the following resources:

<http://www.w3.org/Style/CSS/>

The official development site behind CSS.

<http://www.w3schools.com/css/>

An excellent tutorial on CSS and the various facets of its use.

<http://glush.com/css/>

Layout techniques and tips with CSS.

<http://www.meyerweb.com/eric/css/edge/>

This site has many CSS ideas and techniques.

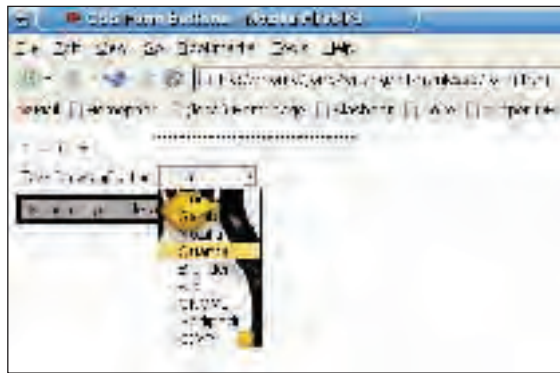


Fig3 Styling forms is simple.

```

border-top: thin dashed black;
border-left: thin solid black;
border-right: thin solid black;
border-bottom: thin dashed black;
}

```

We can then style the select box. To do this, we will put a background image behind the options. I have downloaded a Tux and used it as the background image with the following code:

```

#option
{
  background-image: url(tux.gif);
  background-repeat: no-repeat;
  background-position: center center;
}

```

The background-image tag specifies an url to the location of the image and the image name. We have our image in the same directory, so we use just the file name (**tux.gif**). The **background-repeat** definition next lets us configure if the image tiles (we disable this with the **no-repeat** setting), and the **background-position** definition lets us align the image (we **center** it).

Finally, we can style out push button. This again uses some familiar CSS definitions:

```

#pb
{
  font: button;
  background-color: #aaaaaa;
  border-top: thick solid black;
  border-left: thick solid black;
  border-right: thick solid black;
  border-bottom: thick solid black;
}

```

The result of our styling can be seen in **Fig3** above.

## Conclusion

In this series we have taken a lightning-fast look at developing web pages with HTML and CSS. There are of course, many areas that we have not had time to touch upon, and for this I recommend that you take a look at the *Onwards with CSS* box on the left for more information. CSS is a vast subject and virtually every portion of your page can be fine tuned and styled with CSS. This form of styling HTML is the right way to do it, and the W3C have ensured the flexibility is there in CSS to enable a wide variety of styles and designs with the technology.

Good luck with your web design, and don't forget to let us know how you get on – if enough readers have questions, we may run an FAQ feature in a future issue! If you want to discuss your experiences with HTML and CSS, log onto the forums at [www.linuxformat.co.uk](http://www.linuxformat.co.uk) and have your say! **LXF**



## ANSWERS

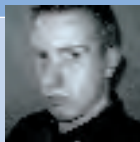
# Answers

**If you are really stuck and the HOWTOs yield no good result, why not write in? Our resident experts will answer even your most complicated problems!**

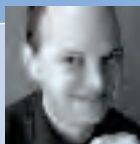
## Our experts

Whatever your question is, we can find an expert to answer it – from installation and modem woes to network administrations, we can find the answer for you – just fire off a letter or email and it'll all be taken care of.

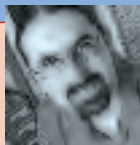
**LXF** answers guy  
**David Coulson** is a  
networking and  
security guru with  
plenty of sysadmin  
experience to boot.



**Nick Veitch** is the editor of the magazine, and answers your easy questions! Or indeed anything to do with *Grub*, *LILQ*, *netatalk*, *vi...*



**Hans Huberland** is Rackspace Managed Hosting's Linux expert. Send any Linux system admin questions to [sysadmin@rackspace.co.uk](mailto:sysadmin@rackspace.co.uk)



## Linux modem?

**Q** Please help a new boy – does anybody know of a Linux compatible ADSL modem? Thanks very much!

**Phil Catchesides.** *via email*

**A** Many people have reported success with the Alcatel Speedtouch USB DSL modem, which is the 'frog' that many residential customers of BT's DSL service will have. Documentation for setting this up, as it requires binary-only kernel modules, is available at <http://tldp.org/HOWTO/DSL-HOWTO/speedtouchusb.html>

## Unauthorised user

**Q** My friend's computer has been incapacitated due to an unauthorised person changing the boot-device. Instead of it being from the internal hard disk it is now using a DVD drive using Linux. Immediately after the logo appears, it asks for an 8 character password, which she does not know. Can this be circumvented, and if so, how? She does have an HP recovery disk, but use of this might cause loss of valuable and un-backed up data. Can you help? She suspects the DVD drive is the same as freebie in the Christmas edition of *Linux Format* magazine. The computer is an HP Pavilion Notebook ZT 1141S

*Derek Butler, via email*

**A** If it is booting off the DVD drive the the logical step would be to remove the disk from the DVD drive and reboot the system. One may also want to monitor the boot process and press the required key to switch into the BIOS configuration to force it to boot from the hard disk first.

What is asking for the password is open to debate. Linux will boot using *LILLO* or *Grub*, that only require



**Apt-rpm is a great way to maintain dependencies on any distribution that uses RPMs. Fedora and Red Hat included.**

password to change the default boot options. If you can better describe the stage of the boot process where the system is requesting a password, it would help in deciding what specifically is requiring a password. Of course, if someone changed the boot device, it's more than likely that they added a BIOS password, which would cause the same symptom.

# Junior Linux

**Q** I am 14, and have a keen interest in servers. I was using Windows with *Apache* but switched to Linux a few months ago. I have a setup as follows; two Red Hat 9 boxes with *Apache*, a Slackware box and a rather large HP-UX HP9000 server.

The question is, what is the best graphical terminal server? I have heard that you can configure X to accept requests from the WAN, but I haven't understood quite how to install and configure it. I have also heard of VNC, but to be honest it's

all cloudy for me.

Also, how bandwidth-hungry are they – can they fit down a 576/288 line? (Down/Up)

Thank you for reading this –  
keep up the good work!

**Tom Lawton,** *via email*

It's always great to hear from one of our younger readers – sorry to hear that you've got a problem. If you want to run a terminal server, you need to run a process such as XDM, or the appropriate GNOME or KDE alternative. These will listen for XDMCP requests and hand out X sessions to clients as needed. You may also want to look at the Linux Terminal Server Project (LTSP) at [www.ltsp.org/](http://www.ltsp.org/), which offers a Linux distribution dedicated to providing terminal services.

From a bandwidth point of view, you're going to need far more than 576/288. Most terminal servers suggest having 100Mbit switched Ethernet, so DSL isn't going to hack it. VNC works very well under low-



Checking the status of `eth0` can be done using a variety of tools, but we need to make sure the right device exists.



Recent kernel versions supply a symbolic link to the kernel source in the `/lib/modules` directory for easy builds.

bandwidth situations, especially if you use *TightVNC* ([www.tightvnc.com](http://www.tightvnc.com)), which offers better compression than the standard *VNC* distribution.

## Perfunctory plugins

**Q** Please help, I'm getting frustrated. When I try to go to chat, I have a message that says I need application X Java VM-plugin. Then when I go to Netscape plugins to download, it says access denied. What am I doing wrong? Do I need to configure something or can it be done automatically?

*Adrian Sholson, Adelaide, Australia*

**A** The plugins in Netscape need to be installed as root, so you will need to run Netscape as root, travel to a site which requires the plugin, then install it. You may also want to verify that you have the correct *libstdc++* libraries which the plugin requires.

## Irksome images

**Q** I have two hard disks installed, with the intention of running a stable Linux desktop from one disk (say) `/dev/hdb` and running an experimental Linux system on the other (`/dev/hda`).

I can boot a selection of images from any one disk, for example, running *LILO* with the following `/etc/lilo.conf` on `/dev/hdb` works perfectly. However, I cannot find a way of including an image to run from `/boot` on `/dev/hda`. Is this in fact possible, or will I have to set up an initial RAM disk to do some jiggery-pokery?

```
###
boot=/dev/hda
map=/boot/map
install=/boot/boot.b
keytable=/boot/uk.klt
lba32
prompt
```

```
timeout=50
message=/boot/message
menu-scheme=wb:bw:wb:bw
image=/boot/bzImage
label="linux 2.4.19B"
root=/dev/hdb1
read-only
image=/boot/vmlinuz
label="linux 2.2.17B"
root=/dev/hdb1
append=" hdc=ide-scsi"
read-only
###
```

I presume that the result of running `/sbin/lilo` with the above is that the MBR is on `hda` and the map is in `/boot` on `hdb`. I also presume that all the information is in the combination of MBR and 'map' and that `lilo.conf` is only used once when preparing these records.

I did consider installing entirely independent systems and swapping the boot disk in BIOS as required but the thought of getting the installation wrong and losing my hard-won stable system persuaded me not to take the risk! In any case that would be less convenient than selecting a system through *LILO*.

I run a Pentium-based non-Microsoft Desktop!

*Peter Antonelli, via email*

**A** You can easily manage two Linux installations by installing *LILO* from one into the MBR, and *LILO* from the other into the beginning of the `/boot` partition. As with Windows, you can point it to a device, rather than simply a kernel, and go from there:

```
other=/dev/hdb1
label=LinuxDev
```

This would boot the **LinuxDev** system off `/dev/hdb`, so one would need to modify `lilo.conf` on the developmental installation to write its information to `/dev/hdb`, rather than `/dev/hda`.

# A helping hand with... MANDRAKE 9.2

## Mandrake & WinModems

My attempted upgrade of MDK 9.1 to 9.2 crashed towards the end, so I installed a new 9.2 in a separate partition. All was fairly OK until the WinModem bit (Conexant chipset). I imagine that many readers will be unaware that Conexant/Linuxant now charge for appropriate drivers, apart from a crippled one at 14.4KBps. And it costs more than the initial price of the hardware!

Some time spent searching the Internet gave the way forward as using the final GPL release in tarball form – `hsflinmodem-5.03.27lnxtbeta03041600.tar.gz`. So I had a go, `tar xfvz`, `make install` as `su`, giving a fair bit of promising looking output, but then I got the following:

```
make[1]: Leaving directory
~/home/grandad/hsflinmodem/hsfl
inmodem-5.03.27lnxtbeta03041
600/scripts'
make[1]: Entering directory
~/home/grandad/hsflinmodem/hsfl
inmodem-5.03.27lnxtbeta03041
600/modules'
common.mak:11: *** Is the kernel-
source package installed?
KERNELSRC does
not point to a proper directory
(/lib/modules/2.4.22-10mdk/
build). Stop.
```

```
make[1]: Leaving directory
~/home/grandad/hsflinmodem/hsfl
inmodem-5.03.27lnxtbeta03041
600/modules'
make: *** [install] Error 2
```

Can you help? Did I install the kernel source with Mandrake 9.2, but in a different place from where the tarball expected? An exhaustive (but uninformed) trip around Mandrake's Software Management/Helps/LDP etc hasn't cast any light on my problem at all. If I didn't install it, what is 'it' – kernel source – and how do I install? Is the backlevel source

likely to work anyway? The information I found online at [www.linuxquestions.org/questions/archive/14/2003/09/4/93445](http://www.linuxquestions.org/questions/archive/14/2003/09/4/93445) suggested that it would.

*Alan Gardner, via email*

Current 2.4 Linux distributions install a symlink to the kernel source tree in `/lib/modules/<version>/build`, making it easier for programs which compile against the kernel source to find the tree. However, the symlink existing does not mean the kernel tree is actually there, so you will have to install the *kernel-headers* package off your distribution CD. This will provide the kernel source tree you require to compile the module to support your software modem.

## Mandrake CDs

I tried Mandrake 9.1 from the cover disks and liked it, so I bought a copy of Personal Edition. I'm running a Micron Millennia MMX w/Evergreen AMD K6-2 333 Upgrade, 128M RAM, Matrox Mystique, Creative 4831E CD-ROM @ Primary/Master, Maxtor 20G HDD @ Primary/Slave, Phillips CDD4801 @ Secondary/Master.

My problem is that when I set up *K3b*, I lose the ability to access the CDs in *Konqueror*. I can burn first time/every time, but when I click on the desktop icons, *Konqueror* opens and the window is blank. I've tried reinstalling several times with the same results. I've also had similar problems with SuSE 8.1, it seems to be an either/or situation. I need the burner and access in *Konqueror*. I'm new at this and I'm finding the Mandrake website kind of confusing: any help at all that you can offer me would be much appreciated.

*Kris Metzker, Boise, Idaho, USA.*

The likely problem you are seeing is that when you burn a CD, you are using the IDE-SCSI system in Linux, which makes an IDE device appear as a SCSI device. This is required if you are wanting to burn a CD under Linux with IDE devices.



# A helping hand with... **MANDRAKE 9.2** (continued)

The end result is that your previous IDE device no longer exists, so you can't mount it. The simplest way to fix this is to check your *dmesg* output after a burn, then modify */etc/fstab* as appropriate for your */mnt/cd-rom* mount, so that it mounts the correct */dev* node.

## MDK vs AOL

Mandrake Linux installed OK. My ISP is AOL. I have tried the standard AOL phone number to connect to the Internet with Mandrake Linux but it doesn't work. What do I need to do? Is it possible to connect to AOL? Has anyone done this or encountered this problem before?

*Roy, via email*

Currently AOL is not supported under Linux, as the ISP does not use a standard protocol for dial-up. There are a few projects which attempt to allow a Linux system to connect to AOL, however they are generally quite immature and don't provide a stable way to access the Internet. The best option is to utilise an alternative ISP, rather than AOL, for connectivity within Linux. We would recommend you try [www.uklinux.net/](http://www.uklinux.net/).

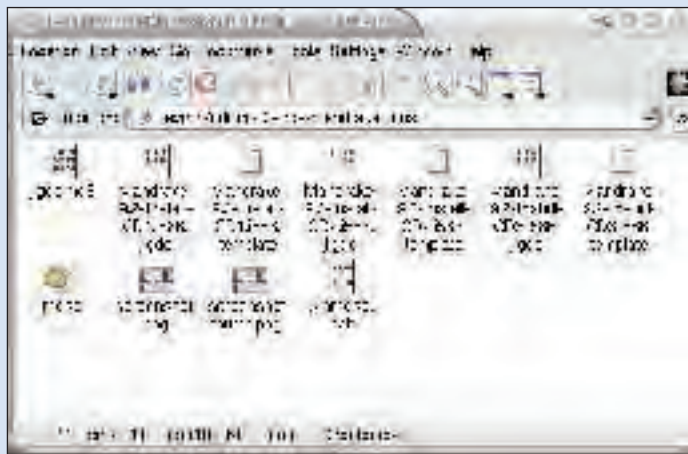
## Give us a clue!

Having seen issue 47 of your magazine in the newsagents, I bought it and tried to install Mandrake Linux 9.2 on my Advent 7026 notebook. (It runs on a Pentium 4 processor, with ATI Mobility Radion 9000 graphics, 512MB RAM and 40GB hard drive).

When booting from *LILO* I get a pass on all processors with the

## INSTALL WON'T START?

On previous Mandrake distributions, some USB devices could cause problems during the initial hardware scan of the installation. It is too soon to say whether this could still happen, but if your system does hang at the start of the installation, try unplugging all non-essential USB devices and starting again. You can configure USB scanners, printers etc after installation by running the *Mandrake Control Center*.



Create CD ISO images of mandrake 9.2 from LXF48's DVD quickly and easily by clicking on an appropriate icon in Linux or Windows.

exception of Bring up interface etho [ the last on a long list of processes] then the list says *Starting pcmcia:* and then hangs.

Can I get Mandrake to run on my machine and how?

Can you advise of a distribution of Linux that will run on my machine?

*Dave Bashforth, via email*

Do you have any PCMCIA devices in your laptop at the time? If so, it's a good idea to take them out unless they are specifically required to make the system work. If not, it may be worth disabling PCMCIA in the BIOS, so that you can install Mandrake first, then look into the PCMCIA problems. You may have more success with other distributions, such as Red Hat/Fedora, or SUSE, although since they will utilise the same major kernel version, you may just end up experiencing the same problem over and over again...

Linux on Laptops is always fun, so checking out <http://linux-laptop.net/> gives you a head-start on it all. So far, no one has posted about the 7026 model, although there may be some information on other similar models that you can recycle into your own circumstances.

## Mandrake modem

I am dual-booting Mandrake 9.2 (which I got from your cover disk) and Windows XP. My WinModem is an Intel 536p. It works with Windows but not with Linux.

I have downloaded the Linux driver from the Intel website, but it refers to Mandrake 9.1 and I can't get it to work.

Tar works, then make clean, but make 536p says:

*Module precompile check  
Current running kernel is 2.4.22-10mdk  
/lib/modules... autoconf.h does not exist*

*please install kernel source  
make \*\*\*[check] Error1*

Can you please help? I have Mandrake 9.1 but I am loath to take a backward step. Should I wait until the Intel site as a driver for 9.2, or can something be done now?

*Alan Rochester, via email*

Firstly, it's complaining about missing kernel sources, which are provided by the *kernel-headers* package. This does not provide the entire kernel source tree, but it does have the headers, which should be more than enough to compile what you need.

The *autoconf.h* header is provided by the *autoconf* package, which should be available on your distribution CD from the magazine. You may also have to include other packages, including *automake* and *libtool* to get things working.

## MDK Modems II

I have Mandrake 9.2 installed, I'm having problems using my Mandrake system, when my ADSL modem is connected up. My system just stops working, I can't do

anything with it, I have to reboot. It is a Speedtouch 330 USB ADSL modem, and I understand that it works with Linux; when I installed Mandrake, it recognised the modem without a hitch. I had the same problem with Mandrake 9.1. So is this a Linux problem and not Mandrake problem?

If I disconnect the modem, my system works OK. I did try to put this line in at boot

```
linux acpi=of nopic
```

but as this has made no difference any help would be appreciated!

*Alan Bayford, via email*

The command line to disable APIC in the kernel is

```
noapic
```

rather than an

```
apic=off
```

switch. It could be that you have a problem with your kernel, and since you were using Mandrake 9.1 and 9.2, it's not improbable that MandrakeSoft patched its kernel in a way that breaks the Speedtouch modem.

The simplest option is to switch to a console, then connect your DSL modem and load the modules. If the kernel panics, then you know it's a particular kernel issue, and you're probably going to have to grab an updated kernel image from Mandrake's FTP server and ensure that you have updated Speedtouch drivers for that kernel version. Checking the *Linux Format* forums is also a good idea, as many people have the 'frog' DSL modems (mentioned in the first answer this issue) for their Internet service.

## Internet 1KBps

My problem is when I try to connect to the Internet using MDK, I can only get a connection speed of 1KBps. When I use Windows I get 45kbps, and for a short time I did actually get that in Linux, but it won't do that anymore and I don't know how or why it has changed.

I'm using Mandrake 9.2 (from LXF47's DVD); & KDE's *kppp* to connect. I have low security settings and no firewall running. The modem is a Genius 56K RS232 external – it's not a Winmodem.

*James McCarthy, Dublin, Ireland*

It's worth checking through the *kppp* logs to find out exactly what your modem connected to your ISP with. If it only got a 28.8k connection, then you're going to have a problem from the outset. You should not need to do anything special to get a v90 connection at 42k or above, although if you are only seeing a v42 connection to your ISP, then you may want to do some research and find out what *init* string your modem likes. 1KBps is pretty much worthless, although you need to check to find out if this is *bits* or *bytes* per second; as if it is bytes, then it would indicate that you've only got a 9600baud connection.

Once it is connected, there could be a number of reasons why it's running slow. A misconfigured firewall on Linux, DNS resolution problems, and so forth. Eliminating the modem from the situation should improve the situation, as you can then look at specifics of your installation.

## MDK incomplete?

I have faithfully installed each version of Mandrake you have kindly provided on the Linux Format DVDs, and each time I have lost something that was working and had to spend hours finding out how to set it back up again. Each

time I try to install something, I get messages telling me that certain libraries are missing; I go in search of them only to find they are the wrong version, often later than the version requested. Are later versions not backward-compatible with the earlier ones?

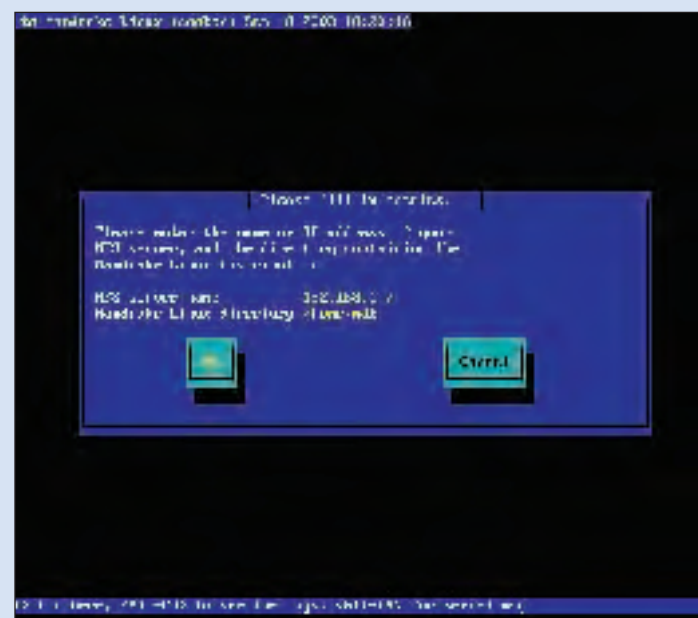
The latest fiasco was with Mandrake 9.2 when I tried to install *Audacity-1.0.0-2*. It was stopped with a message:

**due to unsatisfied libvorbis 1.0rc3** I dug around for it only to find that too required another library. I found that only to be told there was conflict with the MDK version installed... I gave up and went back to Windows!

Since your Multimedia Suite DVD (LXF44) I have been trying to set up video editing using *Main Actor* or *Cinelerra*: both need a video-capture facility, so I found *NewVideoRecorder*. Would it install?

No. The config file could not be created due again to version conflicts. So, I stick with *Adobe Premiere* and its many crashes.

My question is this: is there a distribution that contains all the necessary libraries to run the packages that are supplied, that doesn't require hours of browsing



Setting the source of the files for a network install. More information on these and other installation methods is contained in the *install.htm* file, which can be found in the root directory of LXF47's first disc.

to find the right bits and can be as easily installed as Windows XP? The latest version of *Kmail* doesn't even have an address book, whereas previous ones did!

Having totally given up with ever getting a professional-type video editing package running on Linux, (I suggest the programmers of the current offerings take a look around the editing world), I decided to at least use Linux for audio work and spotted *Audacity* on the Multimedia Suite DVD (LXF44).

"Easy," I thought, "Nice: RPM, simple install..." Oh no, not a chance! First message asked for *libvorbis[>=1.0]*

"No problem," I thought, "Those nice chaps at *Linux Format* will have put that in the *Essentials* section." Yep, there it was, so a quick click and up pops the next message asking for *libogg[>=1.0]*

So I find it and click on the RPM and up pops yet another message:

**Installation failed: file *usr/lib/libogg.so.0.4.0* from *install of libogg-1.0.1* conflicts with file from package *libogg-1.0.6mdk*** I gave up, switched back into Windows and installed *Cool Edit* without a single error message.

I am now concerned that Mandrake's tailoring of library files is making them independent of the

rest of the world, we have enough of those sort of problems with Mr Gates's bloatware.

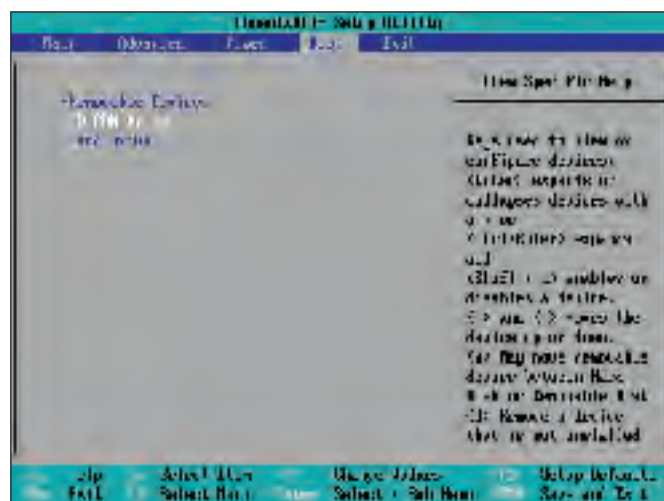
What a shame we have to use the Microsoft operating system purely because programs install so easily. I shall continue to "play" with Linux, but it would seem it is not yet ready for doddering old twerps like me who like a simple life, and have one or two serious jobs to do with a computer...

**Bob Savage**, Gwynedd, Wales  
Dependencies can be a problem with RPMs, as they make installing one package into a major ordeal as you have to track down what is really needed. However, there is a great solution in the form of *apt-rpm*, which you can find information on at <http://apt-rpm.tuxfamily.org/>. This is a port of Debian's APT tool, which is backed up by *dpkg* to the RPM system, so we can simply type *apt-rpm install libvorbis* and get *libvorbis*, along with all of its packages, installed in one easy step.

While not all RPMs are included in the *apt-rpm* database, there is a massive range and it's highly probable that libraries which are required by many different packages will be available through *apt-rpm*. *apt-rpm* is distribution-specific, as distros will install their package contents into different places, so using the appropriate RPM database is required.

## CHOOSING THE BOOT DEVICE IN THE BIOS

Another solution to those no-boot blues...



Using the motherboard's BIOS menu to set the boot devices.

If your computer will not boot from a CD-ROM, DVD or floppy disk, you probably need to change the boot order in the BIOS. This usually involves

pressing a key during startup and making a selection from the menus, but see your computer or motherboard's manual for exact details.



## ANSWERS

WIN A SHARP ZAURUS PDA FROM  
RACKSPACE MANAGED HOSTING

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## Every month, the best question

related to Systems Administration that a LXF reader sends in wins a Sharp Zaurus SL-5500 running Linux.

With industry support from the likes of IBM, SAP, Oracle, and Sybase, the Zaurus features a QWERTY keyboard behind a sliding cover. The 65,536 colour screen is 240x320 resolution. An Intel® StrongARM® 206MHz processor and 64MB memory makes the Zaurus ideal for downloading software or playing MP3 and MPEG1. The docking station that fits into its USB connector, allowing users to synch with their desktop, schedules, address book and ToDo lists. The email app supports POP3 or IMAP email servers. Write and send emails and browse the Internet with a

compatible modem card, or using the infra-red port and a mobile phone; or any replied, forwarded, or composed emails are transferred to your outbox the next time you synch. SD and CF slots allow upgrades and addition of software.

Email all your sysadmin questions and problems to Hans Huberland: [sysadminqa@rackspace.co.uk](mailto:sysadminqa@rackspace.co.uk) Every published query on these system admin pages wins a Rackspace T-shirt.

**We have two winners this month to celebrate *Linux Format's* 50th issue! As well as Simon's *Star Question*, Bruce will also receive a new Zaurus PDA for his insightful comments on the subject of deleting very large files.**

It's only 74mm wide by 138mm long and a svelte 18mm thick – so the Sharp Zaurus really is Linux in your pocket!

WIN!

## ★ Star Questions – PDA winners!

This issue's lucky winners are **Simon** and **Bruce** – your new Zaurus PDAs will be with you shortly!

## Work remotely

**Q** I'm running a standard installation of Mandrake 8.2 with various services enabled (closed-relay SMTP, FTP, SSH etc) and have recently come across the need to run a POP3 server for an existing client and have come across an issue I need help with – also, it might be useful for me to share my experience in setting up the POP3 server.

I'm working remotely using *Webmin*, I installed the `imap-2001a-5.1mdk.i586.rpm` (found from [rpmfind.net](http://rpmfind.net)) and everything seemed to go OK. On issuing `rpm -qi imap` everything looked spot-on. However, when trying to telnet on the POP3 port into the server, either locally from *Webmin* or remotely, I got an 'Access Denied' message.

I'd set up the firewall to route connections on port 110, so everything should've worked – I was puzzled. I checked out `/etc/services` to check that the POP3 port was registered

correctly, and it was. Using *Webmin*, I then restarted the server, just in case installing over the Internet had not been entirely successful in registering the service. Unfortunately, it didn't make any difference.

After hours of trawling forums and newsgroups, I found someone with a similar problem which was caused by the *inetd* service not being started, so I did a `ps -wax | grep inetd` and found that neither *inetd* or *xinetd* were running! So I started *xinetd* using `xinetd -f /etc/xinetd.conf` and then everything suddenly seemed to work. Doing `telnet localhost 110`

I got the response `+OK POP3 machine.domain.com v2000.70mdk server ready` Fantastic! Leaving the server alone, I went back to the office and tried to telnet in remotely on port 110. The connection got established, and then immediately disconnected. Arrggh! I looked at the logs through *Webmin* (what a marvellous tool!) and found the line:

```
xinetd[8812]: FAIL: pop3 libwrap
from=machine.address.com
```

Ahh... getting somewhere now! So finding out that the *xinetd* is passing requests to *libwrap*, I then looked in `/etc/hosts.allow` and `/etc/hosts.deny` and sure enough, `hosts.allow` was empty, but `hosts.deny` was set to deny connections from anything but the localhost. I changed that line and suddenly everything is working perfectly!

Now – my question. At the moment, I need to set up about 5 email addresses for a single domain. So, I thought about creating an entry in the *Postfix* virtual lookup table for [company.com](http://company.com) (my address that I need pop3 accounts for) and then map all the valid users to individual users on the local *Postfix* system, ie: `fred@company.com fred` `john@company.com john` `sales@company.com sales_team` and so on. The problem with this would be that I'd have to create the local users **fred**, **john** and **sales\_team** on the local system.

This isn't so much of an issue for these five accounts, but could become problematic if I need to do this for another client. I think that what I need to do is to use the transport table to map the virtual domain for local delivery – something like 'company.com local:'?

If I do this however, how would I specify the individual POP3 passwords for all five accounts? I'm at a loss – please help! *Simon, via email*

**A** Thanks for the detailed explanation of your *Postfix* problems Simon. Whichever way you decide to set up the domains there will have to be a user account set up for that user somewhere (with one exception I'll mention a little later). If you want to avoid creating accounts for each user in a domain then you will need to set up a single account for the whole domain.

Sooner or later though, you're going to have to authenticate the POP user and let him access his mailbox – this means that eventually you're going to have to specify a username and password pair for each user: no other way around it!



## Wireless Net

**Q** I have an AMD Athlon XP 2600+ with Windows XP. I want to start using Linux, but as yet I haven't even installed my brand new Red Hat 9 distribution. The reason is that I don't know if my Belkin wireless USB network adapter will work or not. I completely forgot this when purchasing Red Hat.

I couldn't find any info about this on the Belkin website, and

don't know if the Red Hat distribution that I have would contain the correct drivers?

Will I have to change my wireless network gear? If so, what company would you advise? Is there any other distribution that does support my Belkin wireless USB network adapter?

Kabsha, Norway

**A** Hello Kabsha. Unfortunately most Linux distributions provide very similar driver

sets. I've had a brief search and cannot find any success stories for that particular adapter, I cannot even find out which chipset it uses. If you are able to replace the wireless NIC I'd recommend anything with one of the following chipsets: Orinoco, Prism II and Spectrum24. These have been around for some time and there are vast tracts of information about setting them up online. The most common unsupported devices out there today are probably any Broadcom-based cards. They've been notoriously ignoring the Linux community despite many requests for information. You may need to look at a PCMCIA-to-PCI adapter as opposed to USB as there is a much wider variety of PCMCIA-based cards out there. There is plenty of good information about setting your wireless card up under Linux here:

[www.hpl.hp.com/personal/Jean\\_Tourrilhes/Linux/](http://www.hpl.hp.com/personal/Jean_Tourrilhes/Linux/)

## On fire firewalls

**Q** I just went to cable Internet and want to keep my local systems secure. Since my router would be on all of the time I opted for an inexpensive Linksys router since it takes a lot less power than a PC acting as a router. Firewalls and shutting down unneeded services is obvious enough, but I am troubled by a lack of understanding in one area: if the router is sharing the one IP from my ISP among multiple local 192.x.x.x addresses, how does it get the right responses from the public internet to the right machine? For example, if four local machines hit [google.com](http://google.com) and search on four different topics, the correct search comes back to the correct machine – but as far as the Net is concerned, they're all from a single ISP-provided IP. Does the router add something to the packet header to do this? Another question is that the router has an

option to 'block WAN requests' to prevent my local network from being pinged. Other than issues resulting from IP forwarding ports that I've opened up on the router to local machines (to serve something up like ftp), doesn't this mean the router is acting like a firewall, and putting up software firewalls on my local Linux boxes is not required?

Richard, via email

**A** To answer your first question, namely, 'how does the firewall know to pass certain pages to the correct computer?' It works in exactly the same way that your computer does if you open up two browsers each pointing to a different site. As you no doubt understand, when you make a request for a web page it is usually done on port 80, however, the request will be made from a port on your workstation, this is also the port to which the webserver will be sending the pages you have requested. All that happens when you put a firewall in the middle is that this firewall keeps track of the port the request was made from and ensures that all replies to that port get passed onto the correct PC. This is commonly called Network Address Translation (NAT) or masquerading.

Generally speaking, you should not require any software firewall on your PCs, the only ports which are going to be accessible from the public internet are the ones that you have set forwarding up for. From a paranoid point of view however, there is no harm in setting up a software firewall on each PC. Security zealots will tell you that if an exploit for your Linksys router becomes available and somebody is able to modify its settings or trick it into letting traffic through then you'd at least have another layer of protection on the PCs. NAT as a method of security is great but it's only as good as its implementation on your router.

If you're concerned about security, it may be best to have a separate POP3 server but for most people just making sure that the user has no shell access should be enough.

There is an exception to this, as I mentioned earlier, and that is to set *Postfix* to store all mail accounts and mailboxes in a database. This is probably quite a bit more complicated than what you are looking to do though. Even in this scenario you would still need to create usernames and password for each email address.

## Big deletes

**Q** First of all, thanks for your *Answers* section in *Linux Format*, very informative.

However, I do have a couple of points regarding your answer to Samuel, (page 94, *LXF48*), on the subject of deleting very large numbers of files, without getting the 'Argument list too long' error. My main point is that your initial suggestion of doing

`ls *.txt | xargs rm`

is really only a partial solution; in that using wildcards may still yield

a command-line that exceeds the (10K if I recall correctly) limit. Of course it is possible to fine-tune the wildcard, eg `a*.txt`, `b*.txt` etc., but this starts to get cumbersome and repetitive.

My recommendation would be to use `find` combined with `xargs`, like so:

`# find . -name '*.txt' | xargs rm`  
Secondly, you give the impression that `xargs` would delete the files, one by one, whereas it actually assembles the longest possible command-line that does not exceed the limit, then executes that. A bit of a quibble, but useful to know when using `find` where it can be vastly more efficient to use `find` with `xargs` rather than using the `-exec` option of `find` which, in the example of deleting large numbers of files, would result in the forking of an `rm` process for each individual file.

Bruce, via email

**A** Thanks for the feedback Bruce. You're indeed correct, you've proved again that there are many ways to skin a cat in Linux (and your way is certainly less messy).

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## « Ethernet et cetera

Help! I'm trying to get a Kobe Mercury 10/100 Mbps Fast Ethernet PCI card to work with SUSE Linux 7.2. *YaST* displays the following information concerning my networking device:

**Network type...** *eth0*

**Networking device module...**

**DM9102 PCI Fast Ethernet**

**Module options...** *this is blank, I do not know what if anything needs to go here.*

The on disc documentation that came with the card suggests that I check to see if my kernel has driver support for the card by looking in the `/lib/modules/AK./net` directory path – but I don't even have an AK. directory! (The nearest I have to this is `/lib/modules/2.4.4-4GB/net` (which I assume to be an analogue). However, even this analogous directory does not contain the necessary driver (a file called `rt8139.o`).

The documentation suggests that as the driver is not present, I will have to compile it myself (at this point I mess my pants), after collecting the source files from a web address that they supply. Unfortunately, typing the full address as supplied directly into *Mozilla* takes me to entirely the wrong website! (I can get to the required website by entering just the first part of the address, but am unable to locate a directory there that contains the required files.)

The `/sbin/lspci` command yields no mention of a LAN card in my system! Is this because the kernel can only 'know' about the card if it has access to a driver (module?) for it?

The `netcfg` command mentioned in the book *Using Linux* by Bill Ball (Macmillan, ISBN 0-7897-1623-2) is not recognised (I tried it as superuser). I assume this is because SUSE stripped it out in favour of its setup tools *YaST1* and *YaST2*.

The Basic Network Configuration component of *YaST2* states that I have two(!) Ethernet interfaces in my system as in the table below...

Since my ISP uses a dynamic pool of IP addresses, I assume that device `eth1` is incorrect...

No.	Active	Type	Device Name	IP Address	PCMCIA
0	—	Ethernet	eth1	192.168.0.99	No
1	—	Ethernet	eth0	DHCP	No



Making laptops work with Linux can be frustrating, but there's many good pointers at <http://linux-laptop.net/>

It also thinks I have two pieces of Ethernet hardware...

Type	Device	name
Ethernet	eth1	off
Ethernet	eth0	off

I don't think Ethernet cards are yet capable of reproduction, asexual or otherwise. According to the Hardware info module of *YaST2*, my system has two network interfaces...

**First Bus: Non**

**Class (spec): Loopback**

**Class: Network Interface**

**Device name: lo**

**Unique key: qtiw.GQNx7L4uPNA**

**Second Bus: None**

**Class (spec): Network Interface**

**Class: Network Interface**

**Device name: sit0**

**Unique key: Dncz.GSopYcFr9cF**

Please explain?

*Tony Bradley, via email*

The first step is to check out what the kernel thinks you have, rather than *YaST*, using `ifconfig`. When we issue a `ifconfig -a`

it will list every device on the system that the kernel knows about. The 'hardware info' section of *YaST* doesn't

tell you about any physical network cards, only the loopback and the `sit0` device for IPv6 tunnels. If you

`modprobe rt8139`

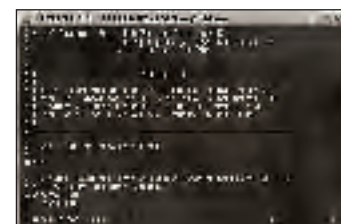
and compare the output to prior to loading the module, you should see `eth0` appear, which you can then configure using *YaST*. You should not require any module options, as it will automatically select the correct IRQ and I/O port for the device.

However, you may want to verify that you are actually loading the appropriate kernel module for your NIC by checking using `lspci` to establish which chipset is actually used by the card.

## Bull by the horns

As an absolute beginner with Linux, I have purchased the Christmas issue (LXF48) in the hope that it may help in my search for an alternative operating system to that of Microsoft. Certain elements of your instructions cause me to hesitate before plunging in. I use Windows 98 SE, 256MB RAM, 40 Gb HD, 500MHz AMD2.

Please confirm that I will be able to boot from the CD-ROM drive straight from the SUSE Linux Cover disk and not wreck my Windows setup. I am not able to see any mechanism to enable a boot routine – but maybe I am just too old! Have



**LILO is a great tool for booting Linux installations, as well as other operating systems.**

taken the proverbial Bull by the Horns, booted off the CD OK, but, at *YaST* saving settings of printers, the installation came to a dead stop with 28 per cent of my HP Deskjet 895 CXI saved. No hope of going anywhere... Big Red Button OFF.

*Eric Fuller, via email*

All of the cover CDs are bootable, so you can just pop them in your drive and off you go! Depending upon the distribution, you may have to go through a number of steps, including repartitioning and pointing *LILO* or *Grub* to the Windows filesystem.

If the distribution installation is not working, it may be best to skip the printers section and proceed with the installation without it. If it still continues to stall, then the LXF forums would be a good direction to head, to find out if someone with a similar hardware setup has experienced the same problem and has any tips. [LXF](#)

# missed one?

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### 73 EXETER UNIVERSITY

URL [www.euslug.lug.org.uk](http://www.euslug.lug.org.uk)

Email [N.J.Murison@exeter.ac.uk](mailto:N.J.Murison@exeter.ac.uk)

### 74 SUNDERLAND

Email [thomas.croucher@sunderland.ac.uk](mailto:thomas.croucher@sunderland.ac.uk)

### 75 EAST YORKSHIRE

Email [sharkonline@whatemail.com](mailto:sharkonline@whatemail.com)

### 76 CLEVELAND OPEN SOURCE GROUP

Email [openlug@digitalmedia.co.uk](mailto:openlug@digitalmedia.co.uk)

### 77 BEVERLEY

Email [vladimir\\_lukyanov@hotmail.com](mailto:vladimir_lukyanov@hotmail.com)

### 78 DUNDEE & TAYSIDE

URL [www.dundee.lug.org.uk](http://www.dundee.lug.org.uk)

### 79 SUSSEX

URL <http://sussex.lug.org.uk/>

### 80 WIGAN & ST HELENS

Email [paulf.johnson@ukonline.co.uk](mailto:paulf.johnson@ukonline.co.uk)

### 81 BRIXTON

URL [www.communitytechnology.org.uk/~linuxhome](http://www.communitytechnology.org.uk/~linuxhome)

### 82 ST.ANDREWS, FIFE

URL [www.standrews.lug.org.uk](http://www.standrews.lug.org.uk)

Email [stuart@nx14.com](mailto:stuart@nx14.com)

### 83 NUNEATON

URL [www.nuneaton.lug.org.uk](http://www.nuneaton.lug.org.uk)

### 84 ISLE OF MAN

URL [www.iom.lug.org.uk](http://www.iom.lug.org.uk)

Email [helix@manx.net](mailto:helix@manx.net)

### 85 AYLESBURY

URL [www.aylesbury.lug.org.uk](http://www.aylesbury.lug.org.uk)

Email [drbond@educational-computing.co.uk](mailto:drbond@educational-computing.co.uk)

### 86 LANCASHIRE

URL [www.lancasterlug.org.uk](http://www.lancasterlug.org.uk)

### 87 EAST LONDON

URL [www.eastlondon.lug.org.uk](http://www.eastlondon.lug.org.uk)

Contact Jonathan Spriggs

### 88 ORMSKIRK

Email [rob@northwestlinux.co.uk](mailto:rob@northwestlinux.co.uk)

### 89 HEREFORD

URL [www.hereford.lug.org.uk/](http://www.hereford.lug.org.uk/)

Email [rbjh@good-news.fsnet.co.uk](mailto:rbjh@good-news.fsnet.co.uk)

### 90 EAST HERTS

Email [madtom1999@yahoo.com](mailto:madtom1999@yahoo.com)

### 91 SWINDON

Email [nick.trueman@ntlworld.com](mailto:nick.trueman@ntlworld.com)

### 92 MENAI

URL [www.menai.lug.org.uk](http://www.menai.lug.org.uk)

### 93 ABERDEEN

URL [www.aberdeen.lug.org.uk](http://www.aberdeen.lug.org.uk)

### 94 SHETLAND

URL [www.shetland.lug.org.uk](http://www.shetland.lug.org.uk)

Email [c\\_s\\_s\\_butler@yahoo.com](mailto:c_s_s_butler@yahoo.com)

### 95 GLASTONBURY

URL [www.glastonbury.lug.org.uk](http://www.glastonbury.lug.org.uk)

Contact Steve Leonard-Clarke

### 96 SOUTHEAST-ON-SEA

URL [www.sos.lug.org.uk](http://www.sos.lug.org.uk)

Contact Derek Shaw

### 97 ORPINGTON

URL [www.orpington.lug.org.uk](http://www.orpington.lug.org.uk)

Contact Barry Schofield

### YOUNG LINUX

URL [www.young.lug.org.uk](http://www.young.lug.org.uk)

### SCHOOLS

URL [www.schools.lug.org.uk](http://www.schools.lug.org.uk)



## LINUX USER GROUPS

### LUG OF THE MONTH

## Lebanon Linux Users Group (LLUG)

**Joy Khoriaty writes:** We are the Official Linux Users Group in Lebanon: a group of various individuals, united by their love for Open Source and Linux, meeting in the most informal way possible. Some of us have been hacking kernel code since that first version Linux first uploaded in 1991; others heard of Free Software just two days ago, and were simply hooked! We are programmers, admins, hackers, teachers, students... a range of people from every walk of life.

Our aim is to promote the use of Linux and FOSS in Lebanon and surrounding area. We will do so by providing Linux distros to anyone who asks; and we build awareness by offering free seminars and workshops discussing Linux. We hang out once a month to discuss what we've done, and what we'd like to do in the future. We will also provide free help and support to any individual or institution using Linux or Open Source Software by means of our site and the mailing list.

Please feel free to contact us for any subject related to Linux or Open Source, and we will be prompt to reply. We would like to hear from individuals, organisations and LUGS across the world to share ideas and tips.

Our [www.linux.com.lb](http://www.linux.com.lb) site is quite new, and therefore a little bare at present: by the time you read this it will feature articles by members of our community, projects we are currently working on, a free forum, and an archive of the LLUG's mailing list.



## Worldwide Linux User Groups

Free Software users across the globe

### Africa

#### EGYPT

URL [www.linux-egypt.org](http://www.linux-egypt.org)

#### GAUTENG, SOUTH AFRICA

URL [www.glug.org.za](http://www.glug.org.za)

Email [glugmin@revolution.org.za](mailto:glugmin@revolution.org.za)

#### THE LORD'S ABODE, JO'BURG, SA

Email [Andrew.Gargan.avrin17@iname.com](mailto:Andrew.Gargan.avrin17@iname.com)

### Australia

#### ADELAIDE

URL [www.linuxsa.org.au](http://www.linuxsa.org.au)

Email [mtippet@anu.edu.au](mailto:mtippet@anu.edu.au)

#### ALICE SPRINGS

URL [www.aslug.org.au](http://www.aslug.org.au)

#### MELBOURNE, VICTORIA

URL [www.luv.asn.au](http://www.luv.asn.au)

Contact [luv-committee@luvasn.au](mailto:luv-committee@luvasn.au)

#### PERTH

URL <http://plug.linux.org.au/>

#### SYDNEY

URL [www.slug.org.au](http://www.slug.org.au)

### Europe

#### COSTA DEL SOL (English speaking)

URL [www.fuengirola.lug.org.uk](http://www.fuengirola.lug.org.uk)

#### DENMARK

Alssund [www.alslug.dk](http://www.alslug.dk)

Esbjerg [www.eslug.dk](http://www.eslug.dk)

Fyns [www.flug.dk](http://www.flug.dk)

Midt-og Vestjylland [www.mvjlug.dk](http://www.mvjlug.dk)

Nordjylland [www.njlug.dk](http://www.njlug.dk)

Skåne Sjælland [www.sslug.dk](http://www.sslug.dk)

Trekantsområdet [www.tlug.dk](http://www.tlug.dk)

Vest-fyn [www.haarby-net.dk/vflug](http://www.haarby-net.dk/vflug)

Århus [www.aalug.dk](http://www.aalug.dk)

#### EIRE

URL [www.linux.ie](http://www.linux.ie)

Email [root@linux.ie](mailto:root@linux.ie)

URL [www.dilu.org](http://www.dilu.org)

Contact [glossary@dilu.org](mailto:glossary@dilu.org)

#### MILUG (Longford)

URL <http://midlands.linux.ie>

Contact [midlands@linux.ie](mailto:midlands@linux.ie)

### Middle East

#### ISRAEL

URL [www.iglu.org.il/IGLU/](http://www.iglu.org.il/IGLU/)

Contact [webmaster@iglu.org.il](mailto:webmaster@iglu.org.il)

#### PALESTINE

URL [www.lugps.org](http://www.lugps.org)

Email [isam@planet.edu](mailto:isam@planet.edu)

### Asia

#### HONG KONG (multilingual)

URL [www.linux.org.hk](http://www.linux.org.hk)

#### SINGAPORE – SLUG

URL [www.lugs.org.sg](http://www.lugs.org.sg)

#### SRI LANKA

URL [www.lklug.pdn.ac.lk](http://www.lklug.pdn.ac.lk)

#### MYANMAR (formerly BURMA)

URL [www.myanmarlug.org](http://www.myanmarlug.org)

Email [aftyde@balug.org](mailto:aftyde@balug.org)

#### PAKISTAN

URL [www.linuxpakistan.net](http://www.linuxpakistan.net)

Email [tux@clug.org](mailto:tux@clug.org)

#### HYDERABAD, SINDH, INDUS VALLEY

URL [www.geocities.com/slug\\_pk/](http://www.geocities.com/slug_pk/)

#### KASHMIR

Coming soon!

### China

#### BEIJING (GB encoding, but mostly written in Chinese)

URL <http://mud.263.net.cn/~linux>

#### CHINESE LINUX USER GROUP

URL [www.linux.org.cn](http://www.linux.org.cn)

#### NANJING

URL <http://jllib.jlonline.com/njlug>

### India

#### LINUX INDIA

URL <http://linux-india.org>

#### ALIGARH LUG

URL <http://linux.amupost.com>

#### BOMBAY

URL [www.ilug-bom.org.in](http://www.ilug-bom.org.in)

#### CHANDIGARH

URL [www.geocities.com/vipinb](http://www.geocities.com/vipinb)

#### CHENNAI AND MADRAS

URL [www.chennaiug.org/](http://www.chennaiug.org/)

#### CYBERABAD (CLUG)

URL <http://seeknew.freesevers.com/clug/>

#### DELHI

URL [www.linux-delhi.org](http://www.linux-delhi.org)

#### KOLKATA

URL [www.ilug-cal.org](http://www.ilug-cal.org)

#### MADURI

URL <http://linuxmadurai.tripod.com>

#### NORTHERN INDIA LINUX

URL <http://groups.yahoo.com/group/lug-northindia>

## Spreading the word

**Jono Bacon** reckons that one of the seven deadly sins and simple human nature is holding back the adoption of Linux.

**Right, I have a quick question for you** all this month. Don't cheat and look ahead, but try and answer as best you can. What is the biggest challenge to advocating Linux?

Some of you may see it as getting the word out to the right people, some may see it as documentation, hardware support etc. Although there are many views, I have eventually come to what I conclude as the main problem facing Linux advocacy: laziness.

Collectively, people are lazy and some companies and vendors capitalise on it. When you are targeting businesses for advocating Linux, some may be interested in the best solution for their needs, but many business will just want the solution that makes their life as easy as possible. Many admins will not want to mess around with configuration files and settings and will just want something up and running as quickly as possible. Although this can seem a feature in some competitors (such as the GUI driven nature of Windows NT), Linux can help in so many other ways

Remember that Linux is a convenient OS in terms of administrating machines in different ways. Many people find the nature of SSHing into a machine to administer it an amazing feature, and the automated software upgrades, task scheduling with cron, solid stability and remote usage of X applications incredibly convenient features. As a general Rule of Thumb, it is sensible to suggest that Linux is a very customisable and convenient system if the user knows how to operate it. Ease-of-use should not be confused with convenience – true convenience is having a system that once set up and configured, ticks along and works well – something that can be applied to Linux for many, *but not all*, requirements.

One of the tips in advocating convenience is to find out what problems and pains the client has with their IT solution. With this information, a suitable Linux based alternative can be possible constructed. Next month we will look into the custom business solutions available: comments and suggestions to

[spreadingtheword@jonobacon.org](mailto:spreadingtheword@jonobacon.org) **LXF**

## Linux User Group organisers

If you're not listed here, or we have your details wrong, please contact us at: **LUGS!, Linux Format, 30 Monmouth Street, Bath, BA1 2BW** or email your details to: [linuxformat@futurenet.co.uk](mailto:linuxformat@futurenet.co.uk)

# Coverdisc



**Neil Bothwick** is your guide through the wonders of the special 50th edition *Linux Format* DVD containing every Hot Picks program we've ever featured...

## HOTPICKS38 DISTCC

If you install most of your software from binary packages, you can skip this section. The same goes if you only have a single or non-networked computer. Still here? Then this program could be very useful for you. Mention distributed computing and most people will probably think of SETI@home, Folding@home, the RC5 contests or others from a number of similar projects. All of these work on the principle that the project can be broken down into a number of much smaller tasks, each one completed on a different computer. The same applies to compiling software, to an extent. The make part of a source installation,

generally the most time consuming part, runs *gcc* many times.

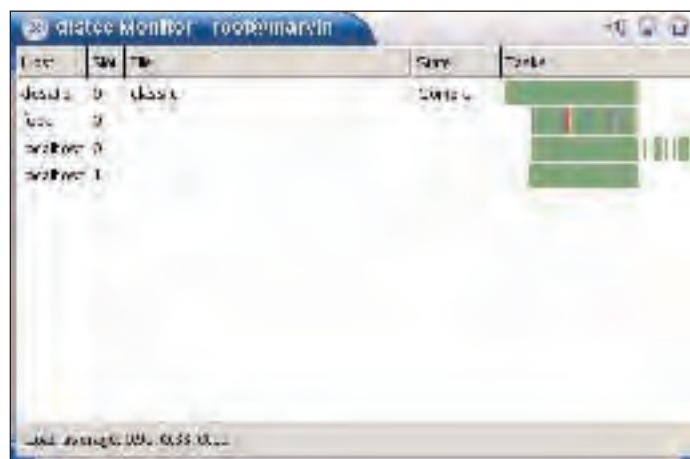
If you have two or more computers, why not spread the work and get it done two or more times as fast? That's what *distcc* does, running compilation tasks on other machines on the local network. This can be a major time saver if you run a source-based distribution, such as Gentoo, Rock Linux or Linux From Scratch.

From its initial description, you might think that it sounds like it could be complicated to set up and work with, but it is surprisingly easy. Installation follows the usual

**./configure && make && make install** waltz, or you can use the RPMs from the coverdisc. *distcc* itself is command-line-based and its required dependencies should be part of your distribution, and probably already installed. If you have GNOME or GTK installed, it will also build a GUI monitor program, RPM users have a separate package for this.

Once you have installed *distcc* on each machine, you need to make sure the daemon is running. It is started with the standard script in */etc/init.d* so use your favourite run level editor to ensure it is started when you boot. Then it's just a case of altering your *PATH*, following the info detailed in the documentation. To compile software with *distcc*, use the **-j** option when you call **make**. This specifies the number of parallel compiles to do. You may experiment to find the optimum setting for your computers, but setting it to one more than the number of processors available is a good starting point, so for a simple network of two single-processor computers, you'd compile with **./configure && make -j3 && make install** instead of the usual **./configure && make && make install**.

Gentoo users should look at [www.gentoo.org/doc/en/distcc.xml](http://www.gentoo.org/doc/en/distcc.xml) for straightforward instructions on how to make *portage* be able to use *distcc* automatically.



**Speed up software compilation by sharing the work between a number of computers. *distcc* is to kernel compilation what SETI@Home is to finding little green (or grey) men.**

## HOTPICKS37 TRANSCODE

*Transcode* is a console-based video-processing program. *Transcode* is to video what *SoX* is to audio or *NetPBM* is to still images. While the idea of editing video in a text console may seem a little odd at first, it makes perfect sense for batch processing. *Transcode* is capable of performing a wide range of basic video processing tasks on a stream of data.

The most common uses are for converting video files or streams from one format to another, such as converting video from a DVD to DivX, or DV from a camcorder to MPEG, possibly deinterlacing the stream in the process. It also includes some basic transformations as well as being able to handle various post-processing filters, both those supplied with it and external programs.

The range of command-line options is huge, and can be quite bewildering at first sight (second and third too for that matter). Fortunately, there is a GUI that makes use of many of *Transcode*'s options, *Video::DVDrip*. I find a combination of the two approaches works best when trying to

process a number of video streams. Use *DVDrip* to process the first and experiment with the options until it is just right. Then make a note of the commands it applies to the video stream and use a batch script to apply those the rest of the streams.

## HOTPICKS28 FREEAMP

This program isn't actually called *FreeAmp* any more, but that's what it was called when it was featured in *LXF28's* Hot Picks, so that's the name it appears under here.

Look in the *FreeAmp* directory and you will find tarballs and RPMs of *zinf* (*Zinf* Is Not *FreeAmp* – yes it's *YARA* – Yet Another Recursive Acronym). Apart from having the dubious advantage of being one of the first names you see if you read webpages from the bottom upwards, the name *zinf* doesn't really make a lot of sense, whereas the old name of *FreeAmp* implied that it was some sort of *WinAmp* clone, which is not a million miles from the truth, (or the minds of *WinAmp*'s lawyers at a rough guess).

Anyway, *zinf* is a media player and a very good one at that. When you first run it, it runs a wizard that can



Wherever you see this logo it means there's related stuff on the DVD

## IMPORTANT NOTICE

**Before you even put the DVD in your drive, please make sure you read, understand and agree to the following: The *Linux Format* DVD is thoroughly tested for all known viruses, and is independently certified virus-free before duplication. We recommend that you always run a reliable and up-to-date virus-checker on ANY new software. While every care is taken in the selection, testing and installation of DVD software, Future Publishing can accept no responsibility for disruption and/or loss to your data or your computer system which may occur while using this disc, the programs or the data on it. You are strongly advised to have up-to-date, verified backups of all important files. Please read individual licences for usage terms.**



## COVERDISC DVD

## DVD CONTENTS AT A GLANCE

## HotPicks49

<b>AntiRight</b>	A lightweight desktop environment
<b>APT-Fu</b>	A source-building and package installation tool for APT
<b>CGI-IRC</b>	A CGI IRC client for IRCing from a web browser
<b>Enigma</b>	Curses-based falling-blocks puzzle game
<b>GL-117</b>	An OpenGL- and SDL-based action flight simulator
<b>Gmodconfig</b>	A tool for manipulating kernel modules
<b>Kile</b>	LaTeX editing program for KDE
<b>Meld</b>	A GNOME 2 diff and merge tool
<b>NewsBruiser</b>	A Python system for running weblogs

## HotPicks48

<b>AmaroK</b>	A media player for KDE
<b>AtomicTanks</b>	A multi-platform Scorched Earth clone similar to Worms
<b>CUTE</b>	A Scintilla-based, scriptable text editor
<b>DOSBox</b>	Like Bochs, but concentrates on emulating MS-DOS
<b>Firestarter</b>	Firewall creation/monitoring tool
<b>Gaim</b>	GTK IM client, supporting heaps of protocols
<b>LTris</b>	A nice Tetris clone using SDL
<b>Netwox</b>	A network testing toolbox
<b>Tutka</b>	Tracker style MIDI sequencer

## HotPicks47

<b>Apollon</b>	Multi-protocol peer-2-peer network prog
<b>BomberClone</b>	A Bomberman-like game with Internet support
<b>Briquolo</b>	A Breakout clone with an OpenGL 3D representation
<b>Epiphany</b>	A multi-platform clone of the game Boulderdash
<b>Flwriter</b>	A small WYSIWYG word processor
<b>Gnumeric</b>	Well-developed spreadsheet app for GNOME
<b>LSH</b>	A free implementation of SSH
<b>Peacock</b>	An HTML Editor for GNOME
<b>Yawk</b>	Yet another WIKI clone

## HotPicks46

<b>Atlantik</b>	The Monopoly boardgame for KDE
<b>Cherokee</b>	Small, clean and fast alternative to Apache
<b>Danpei</b>	A GTK+ based thumbnail image viewer
<b>gPHPEdit</b>	Sweet GNOME 2 PHP/HTML/CSS editor
<b>GRhino</b>	An Othello/Reversi with strong AI
<b>Kroupware</b>	Groupware system built on Kolab and KMail
<b>MozPlayerXP</b>	A scriptable Mozilla MPlayer plugin
<b>ScummVM</b>	Interpreter and emulator for classic adventure games
<b>Straw</b>	Desktop news aggregator for the GNOME environment

## HotPicks45

<b>AbiWord</b>	Svelte multi-platform word processor
<b>FooBillard</b>	A Linux OpenGL billiard simulation
<b>IBmonitor</b>	Interactive console application for bandwidth monitoring
<b>IlohaMail</b>	A light weight multilingual webmail program
<b>KScope</b>	KDE front-end to Cscope
<b>NaturalDocs</b>	Source code documentation generator with transparent syntax
<b>Stoned</b>	A 3D curling game
<b>XFce</b>	Attractive and light desktop alternative to KDE/GNOME

## HotPicks44

<b>AIDE</b>	Free replacement for Tripwire™
<b>Gestalter</b>	A free vector drawing program
<b>GNOMECommander</b>	A GNOME-based filemanager
<b>Kahakai</b>	A fork of the Waimea window manager with scripting support
<b>Madman</b>	A digital music manager
<b>Pathological</b>	Pleasingly presented, polished puzzler
<b>ReZound</b>	Graphical audio file editor crammed with goodies
<b>SoftwareSuspend</b>	Software Suspend support for Linux 2.4 and later
<b>TuxPuck</b>	A shufflepuck game

## HotPicks43

<b>4estsWeblog</b>	A small blog with multi-user, pseudo code, emoticons, etc.
<b>ELinks</b>	An enhanced version of the Links text browser
<b>FrozenBubble</b>	It's Bust a Move, but on Linux...
<b>Gallery</b>	Manage your photos on your own website
<b>ManEdit</b>	Most pleasant way to create manual pages
<b>MiddleMan</b>	A filtering HTTP/HTTPS proxy server
<b>MozillaFirebird</b>	A Mozilla-based browser
<b>TuxTyping</b>	Graphical, educational typing tutorial game
<b>WeirdX</b>	A pure Java X Window System server

## HotPicks42

<b>Barrage</b>	A violent point-and-click shooting game with nice effects
<b>Dillo</b>	A fast, light HTML web browser
<b>FreeLords</b>	A Warlords clone
<b>KMyFirewall</b>	Comfortable UI for setting up iptables

<b>MPlayer</b>	Immensely versatile media player - vast format support
<b>Nessus</b>	Detailed and thorough security checker
<b>Pan</b>	The best graphical newsgroup reader
<b>QuickSpamFilter</b>	Fast statistical spam filter
<b>Twin</b>	A text-mode window manager and terminal emulator

## HotPicks41

<b>EmiliaPinball</b>	A pinball game for Linux
<b>EndeavourII</b>	A file browser, image browser, and archiver
<b>JaysIPTablesFirewall</b>	Iptables firewall script
<b>JuK</b>	A jukebox and music manager for the KDE desktop
<b>LNx-BBC</b>	Bootable rescue CD to fit business card CDs
<b>MonkeyHTTDPdaemon</b>	Small and powerful Web server for Linux
<b>Ratpoison</b>	A window manager that lets you say good-bye to the rodent
<b>SearchAndRescue</b>	An air rescue flight simulator
<b>Thunderbird</b>	Featureful standalone Mozilla mail component

## HotPicks40

<b>Avidemux</b>	A graphical tool to edit video (filter/re-encode/split)
<b>Darkstat</b>	A network traffic analyzer for Linux/BSD
<b>GPLArcadeVolleyball</b>	A multi-platform Arcade Volleyball clone
<b>Junkie</b>	A GTK 2 FTP client with many features
<b>Qixite</b>	A tree-based website-building application
<b>QTVision</b>	A KDE utility for watching TV on your PC.
<b>Rhythmbox</b>	A music player for GNOME
<b>YAALA</b>	General log analyzer with a very detailed report
<b>Zoinks</b>	Programmer's editor and development environment

## HotPicks39

<b>CGI-Shell</b>	A tool which provides a shell using CGI
<b>Evolvotron</b>	A generative image evolver
<b>Kopete</b>	Lovely KDE instant messaging client
<b>Linphone</b>	An SIP-compatible Web phone with a GNOME interface
<b>LSHW</b>	Provide detailed hardware configuration information
<b>NetMap</b>	Network weather map creator
<b>Starfighter</b>	A space themed shooter
<b>Transcode</b>	A video stream processing tool

## HotPicks38

<b>Distcc</b>	A fast and simple distributed C/C++/ObjC compiler
<b>Dnsmasq</b>	A simple lightweight caching DNS forwarder
<b>KVocabulary</b>	A vocabulary trainer for one or more foreign languages
<b>PixiePlus</b>	Mosfet's KDE image/photo viewer, editor and manager
<b>Seahorse</b>	A Gnome GUI for GnuPG
<b>Trackballs</b>	An arcade game similar to Marble Madness

## HotPicks37

<b>Bluefish</b>	A GTK-based Web development editor
<b>Bochs</b>	Competently emulates a full PC system
<b>Epiar</b>	A space adventure/combat game
<b>Gambas</b>	A Basic graphical development environment
<b>KBudget</b>	A budgeting and money management program for KDE
<b>Phoenix</b>	A Mozilla-based browser

## HotPicks36

<b>Anjuta</b>	Smooth GTK-driven integrated development suite
<b>DiskARChive</b>	Backup a directory tree and files
<b>GStreamer</b>	A streaming media framework
<b>libtrash</b>	A shared library that implements a trash can under Linux
<b>Scribus</b>	Highly promising Qt-based publishing
<b>Synaptic</b>	A GUI frontend for APT

## HotPicks35

<b>Childsplay</b>	Suite of educational games for young children
<b>FIAIF</b>	An iptables firewall for Linux
<b>fipphoto</b>	A simple image management, viewing, and printing program
<b>glHack</b>	A full screen SDL port of NetHack
<b>GraphThing</b>	A graph theory tool
<b>Gringotts</b>	A utility to keep track of sensitive data securely
<b>GTK-Lsof</b>	A simple GTK 2 GUI for lsof
<b>ReZound</b>	Graphical audio file editor crammed with goodies

## HotPicks34

<b>BastilleLinux</b>	comprehensive hardening program for Linux and HP-UX
<b>Contest</b>	A benchmark for testing system responsiveness under Linux
<b>CrackAttack</b>	OpenGL game based on the Nintendo classic Tetris Attack
<b>GKrellM</b>	System monitor package
<b>lftp</b>	Sophisticated command line based FTP client



<b>Swatch</b>	The Simple WATCHdog: syslog monitoring utility/daemon
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## HotPicks33

<b>bzip2</b>	Very high-quality data compression program
<b>Dillo</b>	A fast, light HTML web browser
<b>Ethereal</b>	Powerful network analysis tool
<b>MissileCommand</b>	Save your city from nuclear doom!
<b>Netsaint</b>	A powerful network and system monitor
<b>TCPdump</b>	A tool for network monitoring and data acquisition

## HotPicks32

<b>ElectricSheep</b>	Collaborative screensaver
<b>Fluxbox</b>	Small, fast and slick Blackbox-derived window manager
<b>GRUB</b>	GReat Unified Bootloader
<b>Nano</b>	Pico editor clone with enhancements
<b>ntop</b>	A network traffic usage monitor

## HotPicks31

<b>Atlantik</b>	The Monopoly boardgame for KDE
<b>AWStats</b>	Analyses logfiles and produces graphical Web statistics
<b>EndeavourII</b>	A file browser, image browser, and archiver
<b>FreeCraft</b>	Cross-platform real-time strategy gaming engine
<b>Giram</b>	Giram is a modeller, written in GTK+
<b>L-systemExplorer</b>	A GTK-based L-system fractal viewer
<b>Led</b>	A small text editor for Unix
<b>WhiteDune</b>	A graphical VRML97 editor and animation tool

## HotPicks30

<b>FirewallBuilder</b>	Multi-platform firewall management software
<b>GMT</b>	Generic Mapping Tools
<b>LGGeneral</b>	A turn-based strategy engine inspired by Panzer General
<b>LookAtTheStars</b>	An extended image viewer for Linux
<b>Parted</b>	Create, destroy, resize and copy partitions
<b>PfaEdit</b>	A font editor for TrueType and PostScript fonts

## HotPicks29

<b>Epiphany</b>	A multiplatform clone of the game Boulderdash
<b>jEdit</b>	A powerful text editor
<b>Jmol</b>	Java/Swing-based molecular dynamics viewer
<b>KSensors</b>	Im-sensors frontend for the K Desktop Environment
<b>X-CD-Roast</b>	A program-package dedicated to powerful and easy CD creation
<b>XBindKeys</b>	An events grabbing program for X windows
<b>XDirectFB</b>	A rootless X server running on top of DirectFB

## HotPicks28

<b>AlsaPlayer</b>	A PCM (audio) player for Linux/ALSA
<b>FreeAmp</b>	An MP3/Vorbis/CD audio player with jukebox capabilities
<b>LiquidWar</b>	An original multiplayer game
<b>NcFTPClient</b>	File Transfer Protocol (FTP) client applications
<b>Samba</b>	Godsend for UNIX-Windows integration
<b>TeXmacs</b>	A structured "WYSIWYG" technical text editor

## HotPicks27

<b>AbiWord</b>	Svelte multi-platform word processor
<b>AcidLaunch</b>	A light weight GTK based launch bar
<b>BomberInstinct</b>	A multiplayer Bomberman-like game in a maze
<b>gentoo</b>	Two-pane filemanager using GTK+, 100 per cent GUI configurable
<b>GTablature</b>	A guitar tablature editor for GNOME
<b>phpMyAdmin</b>	Handles the basic administration of MySQL over the World Wide Web
<b>Sylpheed</b>	A GTK+ based user-friendly email client

## HotPicks26

<b>Abuse-SDL</b>	An SDL port of the game Abuse
------------------	-------------------------------

**Fluxbox** Small, fast and slick Blackbox-derived window manager  
**FrozenBubble** It's Bust a Move, but on Linux...  
**Grip** A CD player and CD ripper/encoder  
**Karchiver** A little archiver for KDE, like ark but more powerful  
**PhotoGroup** A GNOME image organiser  
**Taglog** Computerised logbook, reports time spent by project

## HotPicks25

**Endeavour!** A file browser, image browser, and archiver  
**GLAME** Audio processing tool and sound editor  
**Gnumeric** Well-developed spreadsheet app for GNOME  
**KDevelop** KDE IDE supporting a plethora of langs  
**LTris** A nice Tetris clone using SDL  
**SCREEM** Site CReating Editing EnvironMent  
**Trommler** An X-based drum machine using the GIMP Toolkit

## HotPicks24

**Maelstrom** Asteroids type game with sound, 3D objects, and more  
**SciTE** Small syntax styling editor for Win32 and GTK+  
**syslog-ng** Portable syslogd replacement  
**Xinetd** Powerful inetd replacement  
**XwinX** X11 client to project the Windows desktop onto an X server

## HotPicks23

**Cricket** System for monitoring trends in time-series data  
**LBreakout** A Breakout-style arcade game using SDL  
**Mutt** A small but very powerful text-based mail client  
**MySQLNavigator** MySQL database server client program  
**Steghide** A steganography program  
**Surfraw** Shell Users' Revolutionary Front Against the World Wide Web  
**Tidy** tidy cleans up system log files created by syslogd  
**VideoLanClient** A multi-platform MPEG, DVD, and DivX player

## HotPicks22

**ChuchuncoCity** A cross-platform 2D fighting game  
**Debfooster** Efficiently manages package dependencies on Debian systems  
**Gmerlin** Gmerlin is an audio/video player for Linux  
**JohnTheRipper** Password cracker to detect weak Unix (and other) passwords  
**MultiGnomeTerminal** An enhanced Gnome Terminal  
**Ogle** A DVD player for Solaris, BSD, and Linux  
**XAnim** Plays a wide variety of animation, audio and video formats  
**XFce** Attractive and light desktop alternative to KDE/GNOME  
**XPenguins** Cute little penguins invading your desktop

## HotPicks21

**Cheops** Network User Interface  
**GNUPrivacyGuard** A PGP replacement tool  
**GPA** GTK frontend to GnuPG  
**KStars** A graphical representation of the night sky for KDE  
**lftp** Sophisticated command line based FTP client  
**mp3blaster** Interactive playing of audio files on a text console  
**netcat** A network piping program  
**Netselect** Reads and writes data across network connections

## HotPicks20

**FileSystemSaint** A lightweight host-based intrusion detection system  
**PortSentry** Protect against portscans  
**recover** A utility which automates some steps to undelete a file  
**ROX-Filer** Drag-and-drop based filemanager  
**SecureTar** A file encryptor  
**TCP-Wrappers** Monitors and Controls incoming TCP connections

## HotPicks19

**Aptitude** Curses-based apt frontend with useful extended features  
**FTPFileSystem** A kernel module for mounting FTP volumes  
**Gutenbrowser** A Project Gutenberg etext reader/downloader  
**Terraform** Interactive digital terrain (height field) editor/viewer

## HotPicks18

**DooMLegacy** An enhanced port of id Software's Doom  
**Etherape** An etherman clone that graphs net activity in real time  
**ext3** Journaling support for ext2fs  
**Kconfigure** A program for compiling programs using a graphical interface

**MrProject** A project management application  
**Prozilla** A download accelerator for Linux

## HotPicks17

**Expect** Automate telnet, ftp, passwd, fsck, rlogin, tip etc  
**GKrellM** System monitor package  
**LavaPS** A lava lamp of currently running processes  
**mcrypt** Replacement for the old Unix crypt program  
**ntop** A network traffic usage monitor  
**rsync** A file transfer program to keep remote files in sync  
**XKeyCaps** A graphical front-end to xmodmap  
**Xlogmaster** Tool to monitor logfiles and hardware status

## HotPicks16

**Antiword** Converts MS Word documents to ASCII and Postscript  
**BusyBox** Tiny Unix utilities for rescue disks and embedded systems  
**Deborphan** A Debian orphaned library finder  
**Evolution** GNOME mail client and PIM  
**MagicPoint** X-based presentation package  
**MySQLGUI** Graphical SQL client for MySQL  
**UserModelLinux** User-mode port of the Linux kernel

**Xfig** A drawing program

## HotPicks15

**Achilles** Evolution simulation based on Larry Yeager's PolyWorld  
**Defendguin** A Linux-themed Defender clone  
**GnuCash** Popular money-managing accounting app  
**ManEdit** Most pleasant way to create manual pages  
**Netclip** Crossplatform copy/paste over your (local) network  
**TeXmacs** A structured WYSIWYG technical text editor

## HotPicks14

**Anjuta** Smooth GTK-driven integrated development suite  
**Atool** A script for managing file archives of various types  
**Exim** Another successful alternative to Sendmail  
**Kaptein** A graphical frontend for command line programs  
**oftpd** Yet another anonymous FTP server  
**procmail** Versatile email processor  
**Snarf** Command-line URL retrieval tool with some unique features

**Xine** A Unix video player

## HotPicks13

**ApacheToolbox** An Apache compilation toolbox  
**ChromiumBSU** Fast paced, arcade-style, top-scrolling shooter  
**GPS3d** A GPS 3D visualization utility  
**Komba2** Samba share browser  
**Krusader** Twin-panel file manager for KDE 3  
**Normalize** An audio file volume adjuster  
**PHP-Nuke** PHP Interactive Web Portal System  
**Sundock** A fancy clock that shows both time and geographical data  
**txt2regex** Regular Expression 'wizard'

## HotPicks12

**CronosII** Powerful and friendly email client designed for GNOME  
**digipencil** A simple sketch pad for GTK+  
**gnomp3** GNOME-based MP3 player, for use with large MP3 collections  
**Plex86** Virtual Machine (VM) for running Linux/x86.  
**Umix** A mixer program for adjusting sound card volumes  
**Webalizer** Web server log analysis program  
**Yabasic** Yet Another BASIC interpreter (Unix/Windows)

## HotPicks11

**DownloaderForX** Downloads files from the Internet via both FTP and HTTP  
**HTTrack** An offline browser which copies Web sites to your computer  
**KFontInstall** KDE-based TrueType and Type1 font installer and previewer  
**QuantaPlus** A web editor for KDE supporting HTML, PHP, and more  
**webCDwriter** A tool for network CD/DVD writing

## HotPicks10

**Amaya** The browser/authoring tool of the W3C  
**GNOME-APT** Graphical package management program.  
**Nautilus** The official file manager for the GNOME desktop  
**WWWOFFLE** Proxy server with special features for use with dial-up

## HotPicks09

**abcde** A better CD encoder  
**August** A free html editor for Linux/Unix  
**ReiserFS** A fast filesystem that stores the files in a B\*-tree  
**Snort** Libpcap packet sniffer/logger/lightweight IDS  
**Tripwire** Intrusion Detection System for Linux  
**Webmin** A Web-based interface for Unix system administration

## HotPicks08

**Dia** A GTK2-based diagram drawing program, similar to Visio  
**Eterm** An X11 VT102 emulator with Enlightenment features  
**Gnotepad** An easy-to-use and feature-rich text editor  
**Nmap** A network exploration tool and security/port scanner  
**TradeClient** Graphical mail client, addressbook, and personal calendar  
**Wget** A network utility to retrieve files from the Web

## HotPicks07

**EasyTAG** A tag editor for MP3 and Ogg Vorbis files  
**flwm** The Fast Light Window Manager  
**Gsx** GTK+ Scour Exchange client  
**j** A programmer's editor written in Java  
**Parted** Create, destroy, resize and copy partitions

## HotPicks06

**Sylpheed** A GTK+ based user-friendly email client  
**UAE** Software emulation of the hardware of the Amiga  
**XMPS** Media player for X based on GTK+.  
**YAFC** Yet Another FTP Client

## HotPicks05

**Angrand** A rogue-like dungeon-exploration game  
**Environ** Manipulate your UNIX environment variables  
**GTelnet** A fancy GNOME telnet client  
**ImageMagick** Automated and interactive manipulation of images  
**Krusader** Twin-panel file manager for KDE 3  
**Xplanet** An Xearth wannabe

## HotPicks04

**Freeciv** Open Source Civilization clone  
**Gnome-Find** Powerful, graphical version of the GNU 'find' utility  
**GnuCash** Popular money-managing accounting app  
**w3m** A pager/text-based WWW browser  
**XMMS** Winamp-esque music player (MP3, Ogg and more)

## HotPicks03

**DownloaderForX** Downloads files from the Internet via both FTP and HTTP  
**GToaster** Create CD-Rs the easy way with GNOME/GTK  
**Karchiver** A little archiver for KDE, like ark but more powerful  
**LineControl** A remotecontrol for internet connections  
**Sawfish** An extensible window manager  
**SmartBootManager** OS independent and full-featured boot manager

## HotPicks02

**AbiWord** Svelte multi-platform word processor  
**CodeCommander** Multi-language programmer's editor  
**eyeUpdate** Updates your IP address with eyep.net  
**Pan** The best graphical newsgroup reader  
**SoundTracker** Well-crafted GTK-based music tracker

## HotPicks01

**FreeAmp** An MP3/Vorbis/CD audio player with jukebox capabilities  
**Gaby** A small personal databases manager using GTK+  
**Grip** A CD player and CD ripper/encoder  
**Mahogany** A user-friendly, standards-compliant GUI mail/news client  
**Moonshire** Language independent development environment  
**Terraform** Interactive digital terrain (height field) editor/viewer  
**wmtheme** A window manager theme utility

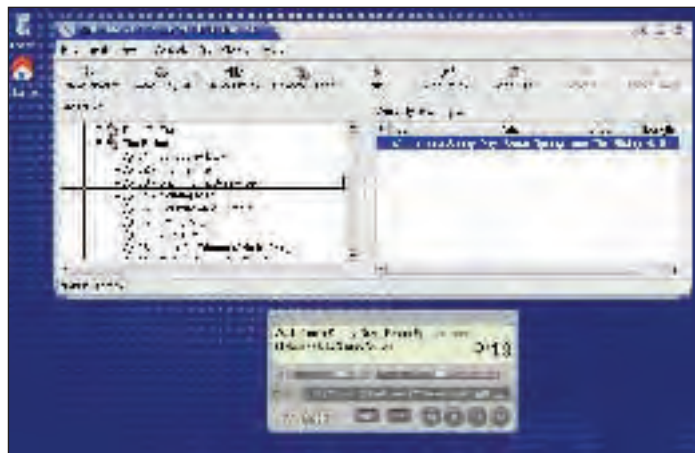
## Help

**LDP** A complete mirror of the Linux Documentation Project





## COVERDISC DVD



**'Zinf is not FreeAmp', but it is a fine MP3, Ogg and CD player with extensive library and playlist facilities.**

« scan all or part of your hard disks for music files and add them to its library. You then use the My Music window to move tracks to and from the current playlist. Playlists can be saved so you could have one for some nice jazz-infused late-night listening for setting a romantic mood for St Valentine's Day, another full of Terry Wogan's favourites for when your mother comes to visit and a list of rugby songs to annoy any visiting Australians who just happen to be passing by.

### HOTPICKS35 FLPHOTO

There are dozens of programs that will display images or create photo albums. There are too many around with wildly different features to be able to state that any one is the best, but this one is good. Its author describes it as "a simple image management, viewing, and printing program", which

pretty well sums up what it does. It provides many of the basic functions that are needed when dealing with collections of images. These are the most often needed basic functions, collected together in one program. It doesn't try to compete with *The GIMP* for image manipulation, but it does provide useful functions like rotating, scaling, brightness adjustment and red-eye removal.

There are functions to organise images into albums, and photos can be imported directly from digital cameras using *gphoto2*, one of our featured 50 Hottest Picks, or read from disk, either files already copied to your hard disk or a camera memory card in a card reader.

Albums can be viewed onscreen, displayed as a slide show or printed. Albums can also be exported to web pages, so the whole World can see pictures of your new baby/pet/car/boat.



**Quick and easy import, processing, management and export of collections of digital images, with *flphoto*.**

## BUILDING SLACKWARE ISO IMAGES FROM LXF48 DVD

WE were informed by some readers that there is a slight problem with the *mkiso* script on *LXF DVD48*. This script should build two Slackware CD ISO images from the DVD, but fails. The Magazine/Slackware directory of this month's discs includes a fix – here are some tips on how to use it:

- 1 Copy the Magazine/Slackware directory to somewhere with at least 1.3GB of free space.
- 2 `cd` to the newly copied directory.
- 3 Put *LXF DVD48* in your DVD drive and mount it.

### 4 Type

`sh mkiso`

in a terminal. You need to be root to do this, some of the Slackware directories are not readable by a normal user.

**4b** The modified script assumes your DVD drive is mounted at `/mnt/cdrom`. If it is mounted anywhere else, give the mount point as an argument to *mkiso*, eg `sh mkiso /media/cdrom`  
**DO NOT `cd` TO THE SLACKWARE DIRECTORY ON THE DVD**

**5** The two ISO images will be written to the current directory, ready for burning to CD-R in the normal way.

**GKrellM provides extensive and highly configurable monitors for your computer, but no sign of Robbie the Robot.**

### HOTPICKS34 GKRELLM

While this program has been featured in *Hot Picks* a couple of times, it didn't make the final list of LXF's top 50. I really like this program, so I've tried to make up for that by putting it in *Hot Picks Extras*. *GKrellM* is a monitoring program. It features a number of monitors, or Krells, that show a great variety of information. There are textual Krells that show things like CPU temperature, the date and time, how many mails are in your mailbox, time online or system uptime, for instance.

Then there are graphical meters like the example shown above right that show CPU usage, disk and network throughput or memory, swap and disk usage. There are many more things you can monitor and many of the Krells can be configured to launch programs when you click on them. For example, you can have the mail indicator launch your favourite mail program.

The real strength of this program is its modular nature. You are not limited to the options provided with the package. I run a third-party module that monitors my UPS, letting me

know if the temperature gets too high or the voltage too low.

Version 2 of *GKrellM* added the concept of a server, so you can run it as a daemon on one computer and display the information on the desktop of another. *GKrellM* is supplied as a source tarball and RPMs for Fedora Core and Mandrake. In addition to the programs, there are also several skins to change the appearance of the meters. In case you were wondering, the name comes from the classic sci-fi movie *Forbidden Planet*. The Krell had a room where the wall was covered with meters... [LXF](#)

## WE WANT YOUR CD & DVD REQUESTS!

### WHAT WE WANT:

- Requests for Free/Open Source Linux software that you'd like to see featured on the LXF coverdiscs.
- Constructive criticism of the software we've included on recent issues.
- Posts in the CD/DVD Requests section on our forums at [www.linuxformat.co.uk](http://www.linuxformat.co.uk)

### WHAT WE DON'T WANT:

- Technical questions – please direct those to [support@futurenet.co.uk](mailto:support@futurenet.co.uk) if you have defective discs, or alternatively [lxf.answers@futurenet.co.uk](mailto:lxf.answers@futurenet.co.uk) if you have an application-related problem.
- Details of commercial apps or time-limited trial versions – *unless* you are a company wanting to offer deals for including a FULL product on our discs.

### WRITE TO US AT:

Linux Format, Disc Editor, Future Publishing, 30 Monmouth Street, Bath BA1 2BW or email: [linuxformat@futurenet.co.uk](mailto:linuxformat@futurenet.co.uk) with 'Coverdisc Request' as the subject-line.

# Essential disc info

Read this important information before you use your *Linux Format* coverdisc – CD or DVD.  
We've collated some helpful info to help you get the most from these jewels of data!

## FINDING THE ESSENTIALS

### Missing something?

As many of the programs on our discs are the very latest releases, they are often built on the very latest libraries and may depend on other packages your current Linux setup does not contain. We try to provide you with as many of these important supporting files and libraries as possible, though obviously we don't have space to include absolutely everything.

In many cases, the latest libraries and

other packages you might need will be included in the "essentials" folder on the disc, so if you are missing dependencies, this is the first place to look.

### Package formats

Wherever possible, we try to include as many different types of package for an installation as possible, whether that be distribution specific RPMs, debs or whatever. Please bear in mind that we can only do this where space permits and when the packages are available.

We will, apart from exceptional or legally restricted situations, include the source files for any package, so that you can build it yourself.

### Documentation

These pages provide helpful information on how to install and use some of the packages on the CD. Please note that many of the applications come with their own documentation, and there are additional notes and files in the relevant directories.

## CREATING INSTALL CDS WITH CDRECORD

The quickest way to burn an ISO image to CD is with *cdrecord*. You need to be root to do this. First find the address of your CD-writer with

```
cdrecord -scanbus
```

This will show the devices connected to your system. The SCSI address of each device is the three numbers in the leftmost column, say 0,3,0. Now you can burn a CD with

```
cdrecord dev=0,3,0 -v  
/path/to/image.iso
```

You can simplify the command by saving some default settings in `/etc/default/cdrecord`. Add a line for each CD writer on your system (usually one) like this

```
Plextor= 0,3,0 12 16M
```

The first item is a label, after the SCSI address you put the speed and the buffer size to use. You can now replace the SCSI address in the command line with the label, but it gets even easier if you add

```
CDR_DEVICE=Plextor
```

Now you can burn an ISO image to disc with

```
cdrecord -v/path/to/image.iso
```

If you really don't want to use the command line, *gcombust* will do the job for you. Start it as root, select the "Burn" tab and the "ISO 9660 Image" gadget near the top of the window. Put the path to the image file in the gadget and press "Combust!". Now put on the kettle while the CD is created for you.

### Other OS?

You don't have to use Linux to burn the ISO to a disc. All Linux-specific bits are already built into the image file. Programs like *cdrecord* simply dump it to the disk. If you don't have a CD-writer, find someone who has one, and a DVD drive, and use the CD burning software on their computer. It can be Windows, MacOS, AmigaOS whatever.

### No CD burner?

What if you have no CD writer? Do you know someone else with one? You don't have to use Linux to burn the CDs, any operating system that can run a CD-writer will do the job (see above).

With some distributions it is also possible to mount the images and do a network install, or even a local install from another disk partition. The methods often vary between distributions, so check on the distro vendors website for more information.

## WHAT ARE ALL THESE FILES?

If you are new to Linux, you may find the profusion of different files and extensions confusing. As we try to give as many packages as possible for compatibility, there will often be two or three files in a directory covering different types of Linux, different architectures and usually source and binary versions – so which do you install? They can be identified by their filenames, and usually just by the file extensions.

**Someap-1.0.1.i386.rpm** – This is probably a binary rpm, designed to run on x86 systems.

**Someap-1.0.1.i386.deb** – The same, but a debian package.

**Someap-1.0.1.tar.gz** – This is usually source code.

**Someap-1.0.1.tgz** – Same as the above, tgz is abbreviated form of tar.gz

**Someap-1.0.1.tar.bz2** – Same, but uses bzip2 compression instead of zip

**Someap-1.0.1.src.rpm** – This is also source code, but supplied as an rpm to make it easier to install

**Someap-1.0.1.i386.RH7.RPM** – A binary, x86 RPM designed specifically for Red Hat Linux

**Someap-1.0.1.ppc.Suse7.rpm** – A binary RPM designed specifically for SuSE7x PPC Linux.

**Someap-devel-1.0.1.i386.rpm** – A development version.

## INSTALLING FROM TARBALLS

A tar ball is a two stage archive. First the files are archived into a single file with *tar* and then compressed with *Gzip* or *Bzip2*. To unpack, *cd* to the directory you want to unpack it, usually your home directory and type one of the following two lines:

```
tar xzvf /mnt/cdrom/Desktop/progname/progname-2.1.0.tgz  
tar xvf --bzip2 /mnt/cdrom/Desktop/progname/progname-2.1.0.tar.bz2
```

Use the first for Gzipped files, those ending in `.tar.gz` or `.tgz`, and the second for Bzipped files, ending in `.tar.bz2` or `.tbz2`. Naturally, you change the paths to suit the location and name of the archive. and replace `/mnt/cdrom` with whatever is applicable to your system (eg `/cdrom`). This normally unpacks the archive into a directory of the same name, enter that directory with:

```
cd progname-2.1.0
```

To compile and install the software, type the following three commands:

```
./configure  
make  
su -c "make install"
```

The last line will prompt you for the root password, as this stage must be run as root. If you are already logged in as root, just type **make install**. This will give you a default installation. If you want to change any aspect of the install, type **./configure --help** to see the options available. For example, you are usually able to change the default location with the **PREFIX** argument. When you have finished installing, you may remove the source files with:

```
cd ..  
rm -fr progname-2.1.0
```

You should also log out as root, before you do anything you may later regret.

## DEFECTIVE CDs

In the unlikely event of your disc being defective please email our support team ([support@futurenet.co.uk](mailto:support@futurenet.co.uk)) for further assistance. If you would prefer to talk to a member of our reader support team please call **01225 822 743**.



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**BLENDER Competition Rules, page 71**

1. Entries must reach the address on page 12 no later than 30 April 2004. By submitting their entry entrants will be deemed to have agreed to be bound by these rules.

2. The winner will be announced in issue 55 of Linux Format, on sale Thursday 10 June 2004 and the winner will be notified personally as soon as practicable either before or after this.

3. The competition is open to all [UK residents] of 18 or over, except employees of The Future Network plc, any of its wholly owned subsidiaries or any marketing services agency, handling house or other company involved directly with the administration of this competition, or any member of their households.

4. There is no limit to the number of entries per household, but each entry must be submitted separately according to the directions on page 71. Responsibility cannot be accepted for entries lost, damaged or delayed in transit to the address at Rule 2. Proof of posting will not be accepted as proof of receipt. Correspondence will be entered into only at the absolute discretion of Future Publishing Limited.

5. The winning entry will be that which in the judges' opinion has completed the challenge in the most aesthetically pleasing way, and demonstrates a mastery of the widest range of Blender features and tools. The judges' decision will be final, and no correspondence will be entered into.

6. The prize will be as specified on page 71. Future Publishing Limited may in its absolute discretion substitute cash value for the prize.

7. Entrants accept that if they win, Future Publishing Limited will have the right, without additional payment or permission, to use their name, age, town of residence and likeness for the purposes of announcing the winner of this competition and for related promotional purposes.

8. All entries will become the property of Future Publishing Limited on its receipt of them and postal entries will only be returned if accompanied by a prepaid self-addressed envelope. Entrants hereby assign to Future Publishing Limited all worldwide copyright and like rights in their entries and waive all moral rights.

9. The name of the winner and the winning entry will be sent to anyone who writes within 3 months after the closing date, enclosing a stamped addressed envelope, to the address in Rule 2 above, requesting details of the winning entry.

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# NEXT MONTH

## ISSUE 51 ON SALE THURSDAY 19 FEBRUARY 2004

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\*where this is actually humanly possible

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The exact contents of future issues are subject to change

# LINUXPRO

FROM THE MAKERS OF LINUX FORMAT

FEBRUARY 2004



# SECURING YOUR BUSINESS

Antivirus, anti-spam, content protection, web-filtering – the services you should be using on your Linux servers revealed

## PLUS

### TeamCAT

Navaho's fire-and-forget server solution powers the Saints' community

### Superquote.com

Linux cost-savings can make a big difference to business viability

### STORAGE

SATA solutions for NAS explored with the NEC Express storage range

### ITANIUM

SGL continues to push the limits of 64-bit Linux with the Altix

**PRACTICAL LINUX SOLUTIONS FOR I.T. PROFESSIONALS**



# Welcome

Twenty pages of real-world Linux for IT professionals

It's easy to consider security as simply the matter of keeping out the bad guys. While this certainly gets a lot of attention – mainly due to high-profile hacks and virus attacks – and is undoubtedly an ever-increasingly important field of IT, we should also consider the wider aspects of the word 'security' and ask just what it means. Your systems are only really secure if, no matter what happens or what is thrown at them, they can continue to carry out the functions required of them.

No anti-virus system is 100 per cent successful. The mere fact that most rely on pattern files should tell you that the virus threat has to be known before it can be countered, and consequently there always has to be someone who feels the effect before the threat is neutralized. Backup strategies and business continuity plans should be as much a part of security considerations as anti-virus tools and firewalls. This issue we look at new offerings from Computer Associates and talk to Paul Eldridge of Trend Microsystems to get a feel of the range of solutions available for Linux.

In other features, we recap the Itanium platform's biggest success and former cover model of *Linux Pro* (April 2003), SGI's Altix server. The combination of 64-bit technology and some cunning engineering from SGI has revived the fortunes of Intel's 64-bit contender – find out how. We also have case studies of an innovative online insurance service; and the deployment of a Navaho all-in-one TeamCAT server appliance by the Saints Study Support Centre (in conjunction with Southampton FC).

As ever, if you have any comments or suggestions for future issues of *Linux Pro*, we'd be delighted to hear them!

**Nick Veitch** Editor  
nick.veitch@futurenet.co.uk



**“The mere fact that antivirus systems use pattern files should tell you that the virus has to be known before it can be countered.”**

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## LINUX ON DEMAND



# It's time to Scale

Linux@ca

## How Computer Associates can empower your business

**W**hat is the meaning of pervasive computing? Ten years ago, the pervasive computing vision was the aim of many large IT companies, amply demonstrated by Bill Gates's oft-quoted dream of having a PC on every desktop. Back then, this was a solid plan to have, and has enabled CTOs to get employees connected on both the desktop and, for the most part, on the move too.

However, with the pervasive vision continuing downward as the questionable drive towards RFID gains pace, many are realising how hard it is to manage the disparate array of machines that they were left with after the desktop drive – in particular that heterogeneity isn't *always* a good thing, particularly in the server room where various components need to talk to each other.

**If your idea of scalability is just having the option of adding another server to your data centre, then you really need to call in the experts. PAUL HUDSON does just that...**

Indeed, it's in the complex interoperation environment of the data centre that many companies are finding the biggest problem: their current system simply cannot scale. This might be because the backup system has been bolted on as an afterthought, or the systems management software was written to handle older technologies, or perhaps even because their web application server isn't able to talk to their mainframe – the result is the same. Despite the best efforts of sysadmins, the average resource utilisation hovers between the 15 and 20 per cent mark, and the question that most needs to answered is "What are you going to do about it?"

### The Two Towers

Taking full advantage of your server room seems like a fairly elementary task – either add more work, or take away



machines until a balance is reached. But it is rarely this simple – a company's IT demands are not as rigid as the numbers in a spreadsheet, and often it's hard to redistribute resources as tasks fluctuate in their requirements.

As such, there are two options – usually mutually exclusive – that can be chosen when trying to maximise what's in your data centre: you either consolidate your machines into fewer, more powerful servers (reminiscent of the mainframes of yore), or you break your machines up into smaller parts such as blades, then cluster them together as appropriate. Naturally, both have their downsides – mainframe-sized machines aren't flexible enough to cope with the changing demands that are so ubiquitous to today's computing environment, and blades are notoriously hard to control unless you build your environment using just one vendor and stick solidly to their requirements.

However, there is a third way. What if you could leave your systems just as they are, with blades, towers, and mainframes all jumbled up, but deploy software that's able to abstract the complexities of your system and give you a homogeneous view of your hardware and software? Furthermore, can such a nirvana be reached using Linux – an OS that many 'independent' analysts have said will *raise* your TCO? Computer Associates certainly seem set to debunk this myth and put Linux at the core of their products.

## All about economics

Although the term 'total cost of ownership' has been bandied around freely to the point where it's hard to define precisely what it means, one thing you can be sure of is that if you take product X from company A, product Y from company B, and product Z from company C, you'll almost certainly be paying more for your trouble than you would if you'd bought the lot from just one vendor. Sure, the principle of 'cheapest possible parts' means that you'd probably save money by shopping around and buying individual bits of software to do individual tasks, but once you factor in the extra work that will have to be done to maintain the system, training everyone to use disparate applications, and fixing the problems that crop up when the products don't interoperate quite as promised means that the money you saved at the outset becomes a drop in the ocean of your mounting costs.

As a result, an increasing number of companies are looking to familiar tried-and-trusted names in the computer industry, an area in which Computer Associates undoubtedly leads the way. Trustworthy computing, despite the somewhat contradictory views of a certain large company, isn't something about which you need to send a memo out to your staff – instead it's a corporate philosophy that should be in products from the ground-up.

Founded back in 1976, Computer Associates has long been associated with security and reliability, mainly thanks to the success it experienced with its range of Windows software. However, more venerable sysadmins will remember that CA started life producing products for mainframes, and so have never really strayed far from the high-end data centre market. As such, it's no surprise to see the company so eager to take advantage of Linux to the full – it has already ported much of its software to



**CA's eTrust suite is an easy way to get started securing your business.**



Linux, is a founding member of the Open Source Development Lab, and the company provides a wide variety of Linux-based solutions to its customers.

## Up and across

Horizontal and vertical scaling is one of the key areas where Computer Associates has been leading the pack for Linux, and its work here is targeted at improving resource utilisation in data centres from their current low. CA's plan here is named 'Linux On Demand', and allows virtual Linux machines to be created on machines in the data centre, which can then have work portioned out across them as necessary to make sure that each machine is utilised properly. With this method, more CPUs can be added to individual machines as necessary (vertical scaling), or indeed

**“Most of our developers will be developing on Linux workstations by the summer of 2004.”**

MARCEL DEN HARTOG, CHIEF EXECUTIVE – LINUX TECHNOLOGY GROUP, COMPUTER ASSOCIATES

more whole machines can be added to the data centre (horizontal scaling) so that the whole system can grow as necessary without any need for complicated and costly shuffling of systems.

This virtual machine idea was first tried out by IBM on OS/390, but there it was mainly as a proof of concept – CA is the only company we know that currently offers virtualisation as a competitive solution to an existing problem. Of course, CA has a range of other offerings you can put together to get your own custom solution to this problem, of which one of the most popular is the *Unicenter Network and Systems Management (NSM)* tool, which makes it easy to literally move applications around your data centre if you find they need more or less power, and can automatically reconfigure supporting services such as your backup system. Suddenly all your systems, whether they are Itaniums, x86, blades,



## LINUX ON DEMAND

« mainframes, virtual machines, SPARCs, or even desktops appear to be the same, which means you spend less time worrying about configuration of individual systems and more time focusing on overall system stability and performance.

### Talk back

We spoke to Marcel den Hartog, Chief Executive of the Linux Technology Group at Computer Associates, about where CA is with Linux right now, what the advantages over its competitors are, and where he thinks Linux is going over coming years...

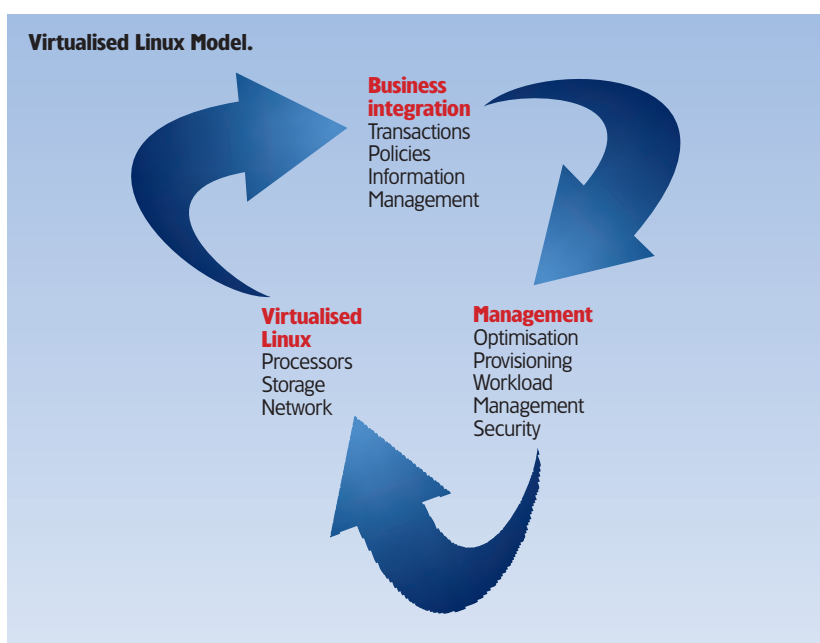
#### **LINUX PRO:** What products and services has CA made available on Linux?

**MARCEL DEN HARTOG:** Most of CA's best-selling products have been made available for Linux.

This includes security solutions like *eTrust Access Control*, *eTrust Single Sign-on*, and *eTrust Admin*; enterprise management solutions such as *Unicenter ServicePlus*, *ServiceDesk*, *Unicenter Network & Systems Management* (which is for managing and monitoring of systems, databases, networks and applications), *Unicenter Software Delivery*, as well as special Agents for *Apache*, *WebSphere*, asset management, performance management and such, and also various mainframe solutions for z/OS to manage Linux instances running under virtual machines.

Of course, we also ported our popular storage management solutions, and tailed them to various business sizes. *BrightStor ArcServe*, for example, is optimised for low-to-medium size Linux deployments, whereas *BrightStor Enterprise Backup* is better for medium-to-high-end Linux

#### Virtualised Linux Model.



deployments. Finally, our information management software has been ported to Linux also, which includes *CleverPath Portal* and *AION*, our *RDBMS*, *Advantage Ingres*, and *AllFusion Harvest* for software change and configuration management. This list isn't complete, but I've tried to cover the most popular solutions!

#### **LXP:** That's quite a few products! What made CA commit to the Linux market in such a big way?

**MDH:** CA has always offered IT users hardware- and OS-independent solutions to allow freedom of choice. We have

## CA IN ACTION

How a subsidiary of Orange use CA's tools for Linux to help keep its system running.

**THE TELECOMS INDUSTRY HAS A RANGE OF infrastructure systems that millions of people rely on, that need to be up 24/7/365. We spoke to Gilbert Peter, the Network and Telecoms Manager for Orange Caraibe, the number one provider of mobile network telephony in the French West Indies and Guyana, covering Guadeloupe, Martinique, French Guyana, Dominica (in 2004), Saint Barthelemy and Saint Martin – all the zones with the greatest population density. Services developed by Orange Caraibe include SMS, WAP, GPRS, news, free email, and more.**

At each of its seven sites, Orange Caraibe deploys a selection of hardware systems and also runs a mix of operating systems, including Red Hat Linux, Microsoft Windows NT and 2000, and Novell Netware clusters.

#### **LINUX PRO:** What problems did you face before you deployed your CA solution on Linux?

**GILBERT PETER:** We wanted to leverage Linux in our environment for its speed and server reliability so our goals were multifold:

- We needed to reduce the window of backup on all our sites
- To ensure the continuity of the services and the availability of the data
- Rapid restoration
- Centralisation of the administration of the backup servers
- To be able to draw up reports/ratios on the use of the resources

#### **LXP:** How did the CA solution solve those problems?

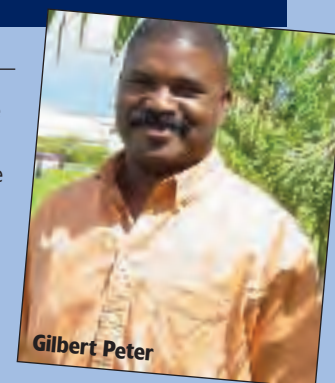
**GP:** With *BrightStor ArcServe* for Linux we were able to close the backup window, gaining four hours of productivity – an 80 per cent improvement in backup time. With the reduced backup time our IT team was able to access data and keep working on critical applications. The centralised administration of the backup servers was a major benefit to Orange Caraibe.

#### **LXP:** What issues did you have with the CA solution, and how were they solved?

**GP:** Since we are very familiar with using CA's storage solutions on other platforms, using CA's *BrightStor ArcServe* for Linux was very straightforward – we didn't have any issues.

#### **LXP:** What was the key advantage to switching to the new solution?

**GP:** We also use Windows and Netware, so for us the centralised management of our storage backup was critical. It was a great advantage for us to be able to also manage multi-platforms remotely with a product that we were familiar with. We are also looking at using CA's *eTrust Security* solutions on Linux as well as *Unicenter* (in 2004). The fact that the products are available on multi-platforms is great for our heterogeneous environment.



Gilbert Peter



always believed that the decision to buy hardware should be based on business reasons and not on lock-in from a specific vendor.

Our software runs on multiple platforms and offers a unified interface across these platforms, and we recognised very early that Linux would rise as "another viable solution" for our existing and potential clients. The combination of reliability, flexibility and potential cost savings is so strong that we felt that there would soon be a need for professional solutions.

**LXP: So where do you see Linux fitting into your overall plans for the future?**

**MDH:** Linux is an essential part of all development efforts of CA. Not only do we develop new products with Linux in mind, we develop products especially for Linux and most of our developers will be developing on Linux workstations by the summer of 2004.

**"CA has always offered users hardware- and OS-independent solutions to allow freedom of choice... The decision to buy hardware should be based on business reasons, not lock-in from a specific vendor"**

**LXP: What were your primary reasons for switching your developers over?**

**MDH:** There are a number of reasons for switching: primarily, it will help our developers to better understand what Linux is about and also:

- 1** Since they will still run Windows in a *VMWare* environment, they will get a better understanding of the virtualisation issues that this tool supports.
- 2** Most of the development tools support cross-platform development and we want our development people to be platform-agnostic.
- 3** Linux has repeatedly proven to be a very stable environment to develop under.

**LXP: Which businesses would benefit most using CA products on Linux?**

**MDH:** There is no single business that will benefit most. You could say that our existing clients will benefit most because it is easier for them to adopt Linux and simply install a Linux version of a product they already use. This saves on training and implementation time. New users, however, have the ability to buy products from a company with over 20 years experience, together with the added benefits of support, adoptions of new standards and training.

**LXP: Does CA plan to make use of kernel 2.6 as soon as you've finished testing it?**

**MDH:** Yes, CA will aggressively make use of the features of Kernel 2.6 for a number of reasons. It contains a number of features (especially in the area of virtualisation) that our larger clients will benefit from and that we need to leverage in our products. Also the scalability to support more



**CA Unicenter: set for use in Orange Caraibe in 2004. Mature products are often preferable for communications solutions, as dependability is a primary consideration.**

processors and the support for NUMA is very important for our larger clients and we want to make sure we utilise this feature the best way we can. Another major hardware advancement supported under Linux 2.6 is hyper-threading. Also in the area of storage management (back-up and restore) the enhanced support for Block devices means that back-up tools can take full advantage of greater transfer rates.

Linux now also has new support for IPsec protocols. IPsec allows IPv4 ('standard') and IPv6 ('new') cryptographic security at the network protocol level (a lower level than before). Given the attention that is needed these days for security, we expect that companies will want to use this and we will make sure our *eTrust* suite supports this. These are just a few of the enhancements that will make 2.6 an even more robust, scalable and therefore more attractive OS for large companies.

**LXP: Does CA manage to contribute much to the Open Source field?**

**MDH:** CA has donated code in the past (security modules, storage drivers amongst others). CA is currently looking at more donations and we do this together with the distributors, the OSDL and the community.

**LXP: What are CA's biggest advantages over its competition?**

**MDH:** Our biggest advantage is the 'cross-pollination' our wealth of products can provide. Different development teams learn from each other, and standards are implemented quickly and cleanly. CA already offers the largest integrated suite of Enterprise Management solutions and a new server can be secured, configured, monitored and backed-up from day one all with CA tools.

**LXP: Where do you see the Linux market heading over the next few years?**

**MDH:** The Linux market shows incredible growth. We have seen rapid growth in adoption in North America, but Europe is close behind, with adoption steadily increasing. In Europe, Germany is the strong leader. More and more servers will run Linux and there will be a change in the way Linux is now used. Where most Linux servers were originally used as Web Servers, more and more are being used as Database and Application servers. This requires additional tools that CA can provide. The virtualisation techniques that Linux supports will allow a reasonable quick adoption of on-demand computing – something that our users are very interested in, whatever the size of their operation.

**LXP: What are CA's Linux plans for the future?**

**MDH:** The on-demand computing era is coming, and thanks to the power that Linux offers, adoption will be easier with this OS. In particular, the virtualisation of processing power, storage, network bandwidth and memory that require new tools or new versions of existing tools. We are working hard with our clients, the Linux community and several universities to create solutions that allow these techniques to be implemented in an easy and affordable way and ensure that we support the latest developments. ■



All-star

Altix

**A**lthough the Itanium CPU had quite a slow start in the computing industry, the main problem has been that many saw it as being something it simply isn't – a desktop machine. While the Opteron is a great chip for raw compute speed and for making the transition to 64-bit, it lacks several of the enterprise-level architectural features that make Itanium so attractive, and also potentially so costly. We spoke to Crispin Keable, High-performance Solutions Manager at SGI, about the advantages of the Altix-Linux combo.

#### **LINUX PRO: Where does Altix fit into SGI's offering?**

**CRISPIN KEABLE:** The Altix is at the heart of SGI's high-performance computing product set and company strategy. Altix is SGI's world-beating NUMAflex architecture coupled with commodity economics from Intel's Itanium-2 microprocessor and the Linux OS. Altix delivers exceptional performance and scalability at an affordable price.

With the success of the Altix since its launch in January 2003, SGI is adding to the Altix family in the first half of 2004 with the introduction of a new low-end version. Looking to Linux in visualisation into the future, SGI has big plans for taking the Altix forward. This doesn't mean however that SGI is walking away from its Origin product line, because both Origin and IRIX are still very relevant and the best-fit for many of our customers that require specific features where Origin excels. We still see good demand for Origin, which is a more mature and feature-rich system.

#### **LXP: What are the key advantages of Altix?**

**CK:** Performance and scalability – The Altix has world-beating performance on many codes and uses arguably the world's fastest microprocessor with a peak performance of 6 Gigafllops. The Intel roadmap for Itanium 2 is also a key advantage, with the Altix developing alongside Intel's leading 64-bit architecture. Intel invests very heavily in research and development to produce the superior microprocessor architecture we use in Altix. SGI has every confidence in this continuing, and we will work alongside Intel to enhance our system offerings so that together we can continue to deliver world-leading solutions for our customers.

The Altix is the third generation of SGI's NUMAflex architecture and we have incorporated innovations in scalability, performance and RAS at each generation. A crucial feature in Altix is its system manageability, based on prime time toolsets from SGI's own work in IRIX subsequently ported to Linux, but also bringing in tools available from the wider Open Source community.

**SGI's mean-machine server continues to woo IT directors and datacentre admins alike, but what actually makes it so special, asks PAUL HUDSON...**

**The SGI Altix has won five awards since its debut in January 2003, including the 'Best of Show' honours at LinuxWorld 2003.**

Since the launch in January 2003, the Altix has developed a wide application base, currently standing at 90 different applications. Half of these are making use of features unique to Altix such as maths and scientific library and optimised message passing. Mission-critical applications such as Oracle and SAP are also becoming available on the Altix.

Another key advantage for Altix is the SGI support model that customers buy into. With a 'one-stop shop' approach, SGI customers can receive total support for both software and hardware in contrast to other Linux offerings, where customers may have to call different people for each query. In situations where software may not be integrated and other such issues, customers may be unsure whom to call.

#### **LXP: How important would you say Linux is to SGI's enterprise plans?**

**CK:** We see Linux as pivotal to SGI's enterprise plans. There have been recent concerns in the community around SCO, but SGI believes these to be groundless, and we see people continuing to move towards Linux in ever-greater numbers.

As part of SGI's commitment to Linux we recently announced a strategic partnership with SUSE, which sees SUSE Linux Enterprise Server 8 available on Altix systems. The fact that Novell has now bought SUSE only adds strength to the relationship with a wider reach for the Altix and a broader business-based acceptance of the Linux OS.

#### **LXP: How much longer does SGI intend to produce and distribute IRIX?**

**CK:** SGI will continue to produce and distribute IRIX systems for as long as our customers continue to get value from them. We have product plans for the MIPS CPU stretching out to 2006, and the Origin systems based upon them. These systems still deliver unique capabilities.

The package of Origin, MIPS and IRIX deliver robust security, Real-time, data and network intensive workload support, and mission-critical support that our customers continue to find exceptional. While they do so, SGI will continue to support them with quarterly OS release plans right out to 2011.





At the same time, we continue to port IRIX functionality into the Linux world as appropriate to meet customer demand.

**LXP: What technology problems do your customers often face before their Altix system is put in place?**

**CK:** Merck, a big US pharmaceutical company, bought a range of products including an Altix to integrate its informatics and molecular profiling into basic and pre-clinical research. One key reason for their choosing of the Altix was down to its ability to access very large memory.

**LXP: How did the solution solve these problems?**

**CK:** In contrast to other Linux systems, the Altix is a real supercomputer with high-performance access to vast quantities of memory. It doesn't just give access to more CPUs: it can also quite easily apply the power to larger 'problems', meaning researchers get a faster turnaround and accelerated workflow. This is very applicable to users in bioinformatics where time to market is a crucial success factor. Despite the scale of the compute power involved, using the Altix is a straightforward process for the scientist or researcher being able to access that power.

In summary, Altix doesn't just raise HPC performance for users, but also makes their lives easier by being easier to use. So Altix lowers the entry costs to HPC.

**LXP: What kinds of businesses would benefit most from an Altix-based solution?**

**CK:** Industries involved in research or creative media will see the benefits mentioned above, and also anyone who needs a large central computing resource. For SGI this could be in the energy industry, digital media, government and defence, pharmaceutical, manufacturing or sciences. With Altix, we are also seeing its ability to act as a fileserver in a wider Linux environment. So, for example, where there is a Linux cluster or a large number of Linux machines, the Altix becomes a centralised resource, acting as a high performance fileserver.

The other area where Altix is proving interesting is where companies require gigantic memory. So, where there are I/O issues associated with very large databases, you can have an Altix that has a TB scale memory and the I/O problem disappears. SGI is now routinely shipping Altix systems with terabytes of real memory – larger than many people's disk stores – to turn problems that previously took weeks into just a few hours. This has become possible in the Altix partly through the Altix modular system architecture and also because of SGI's use of commodity parts in the Altix.

**LXP: How well does the Altix system cope with very large-scale clustering?**

**CK:** There are some situations where the most cost effective solution is a cluster, but as soon as you have to do some serious work to fit your workflow onto a cluster, extra costs creep in for the cluster-based solution. Most customers do not have the very homogeneous workload that functions best on a cluster: 'lumpy' workflow, with problems of varying different sizes and different degrees of urgency, are much more typical. We have yet to meet a

customer in business or research that doesn't have deadlines to keep and targets to meet. With the Altix, it is possible to accommodate this type of variable workload efficiently and with much more flexibility without the headaches that you get with a cluster.

In situations where customers have a workload that works well on clusters, we have found that an Altix can be a powerful file server – one benefit of Linux is that you can have the same operating environment from the cluster to the file server to the HPC system.



**“There have been recent concerns in the community around SCO, but SGI believes these to be groundless...”**

**LXP: How well positioned is SGI, using the Itanium 2, to take on the HPC market?**

**CK:** SGI has shipped over 5,200 CPUs of Altix since its launch in January 2003. This includes some extremely big systems, including a 512 processor system to NASA, a number of 256 processor systems to National Labs in the USA, the CSAR service at the University of Manchester and Total Fina in France to name but a few. Customers just keep coming back for more – more memory, bigger systems and upgrades.

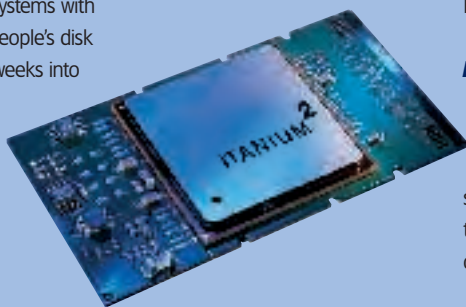
SGI has also undertaken a significant development programme to take advantage of the Itanium 2. As this evolves, SGI will bring out upgrades to the system architecture to take advantage of them. An example is the recent introduction of Intel's low power version of the Itanium 2, which will be available through Altix based systems too.

SGI's perspective is that Linux is ready for the prime time in the high-performance computing world. The HPC market is moving away from the question of whether Linux 'might work for you' and is now asking 'how do you make Linux work best for you.'

**LXP: You say Altix shipped 5,200 CPUs of Altix – how many machines does that translate to?**

**CK:** We have shipped systems from the very small to the very large, from 4 CPUs right out to 512 CPUs. Average system size is about 24 CPUs at the moment, but we expect that to grow over the next few months to an average system of roughly 32-40 CPUs.

At the Supercomputing 2003 show (SC2003) in November 2003, SGI displayed an Altix supercomputer powered by 128 processors as a single system image machine. A number of customers discussed their use of more than 128 processors as a single system image; for example, NASA – whose 512 CPU system has demonstrated a phenomenal memory bandwidth of over one terabyte per second! This is a world record for any system, including vector-based systems. ■



**An Altix user, Manchester University, won the HPC Challenge Award at SC2003 for the HPC challenge experiment, based on a materials modelling app. Run from Manchester and linked to other systems around the globe with the results then visualised on a number of different systems in the UK and US – all achieved in real-time!**



# Trend for protection

**NICK VEITCH** finds out what Trend Microsystems's latest deal with IBM means for secure Linux environments.

**B**ack in May 2003, Trend Micro – one of the leading lights in security solutions – announced its Linux initiative: to extend the scope of the company's offerings to include Linux systems as well, increasingly more important in the modern world where Linux powers at least a part of nearly every corporate IT structure.

Recently, Trend Micro also announced partnership agreements with IBM and CSF to extend the reach of their offerings and enable customers to get security solutions as part of a complete IT solution. But what security do they think we need, and how is it implemented? *Linux Pro* talked to Trend Micro's Paul Eldridge.

**LXP: Why is Trend Micro now interested in Linux? Is it due to demand, increased threat?**

**PAUL ELDRIDGE:** It's a combination of things. On the server side of things, IDC's recent tracker report shows six consecutive quarters of growth for Linux servers, and that's fuelling a lot of interest. Looking at the figures, it was a 49 per cent growth in revenues and units shipped grew 51.4 per cent, year-on-year.

That's one side of the equation. From the customer perspective, there's clearly interest in reviewing the solutions available on Linux now. From our side, we not only provide antivirus, but also content security solutions. Generally speaking, with the economy in the IT market the way it is, spend in the security area is phenomenally high. We're seeing a good level of interest, and we're able to fulfil their needs right the way across the infrastructure, from gateway http/ftp/smtp scanning and heuristic scanning, through to protection for the *Domino* mailserver, and file and storage servers on Red Hat and SUSE Linux.

**LXP: Is that why Trend Micro has partnered with other organisations?**

**PE:** With regard to the EMEA IBM/Trend micro initiative, we launched that in conjunction with IBM, leveraging the fact that security spending is high, Linux is popular, and customers are interested in doing 'best of breed' solutions for hardware for middleware and content security and antivirus wrapped by services

capability for implementation, consultation *etc.*, by IBM business partners. In the UK two companies are already doing that with us, Computacentre and CFS – and a number of other companies across Europe.

**LXP: Let's talk specifically anti-virus for the moment. There are a number of solutions in this area. A lot of criticism has been levelled at those selling solutions in the past, suggesting they are scaremongering and there isn't that much of a threat.**

**PE:** That's not the case. It's our role to be informative in this area, and let customers know about specific threats and how to protect their organisation. We have seen well publicised viruses such as SoBig, Mymail, and Bugbear. The most notable of the moment would probably be MS-Blaster.

As far as AV is concerned, it is our responsibility to provide the latest pattern files as quickly as possible. We also go one stage further than that for our Enterprise Protection Strategy. This is unique in the industry, and provides a policy for deployment within an organisation that will block the various entry points for virus attack. This saves a lot of time and cost in any cleanup activity that may be necessary.

From our point of view, as Linux adoption grows, so does its popularity for virus attacks. Now we've seen a good level of interest and adoption rates [for Linux] in the government sector, financial services and healthcare. Clearly this is indicative of this particular offering becoming mainstream.

With all servers, Linux is subject to denial-of-service attacks, other examples might be cross infection through *Samba* shares or through some document formats such as *MS Office*. Some office solutions for Linux have a macro capability and therefore macro viruses might be created.

**LXP: The perspective of most Linux users is that, since the nature of the system is to be more secure; and indeed the diverse nature of Linux offerings tends to make the Linux OS very difficult for a virus to be successful.**

**PE:** That's a very valid point. At this stage there are very many Linux flavours available. It will be interesting from a security perspective if these consolidate, to see what may



happen regarding a security threat. Our own internal figures show virus threats on Linux have increased 30% in the last year: we saw 62 in 2002 and it was over 100 in 2003 up to June, with a further 396 between June and November. Compared to Unix systems, the numbers are 20 for 2002 and 21 this year.

**LXP: How does that compare to Windows?**

**PE:** Obviously there are many more. Our research indicates that from January to November 2003 there were 16,800 malicious threats (viruses) to Microsoft Windows.

**LXP: So while Linux security may not be a mass-media headline yet, your advice is that it's better to be safe and out measures in place now?**

**PE:** Yes, it's an interconnected IT world. Even though you're a Linux magazine, many of your readers will still probably use some Microsoft applications: they are a vector for transmitting viruses; so is the external threat, and also cross-infections.

**LXP: Is that a more buoyant, practical sector to focus on? With Linux solutions being more evident in file servers, NAS devices and storage in general, it's useful to be able to scan for these on that platform to protect Windows clients that may connect.**

**PE:** Most of the early adoption is to evaluate it in these areas. Around 80 per cent of such attacks try to get in through the gateway, so that is a big focus.

**LXP: What are your recommendations to enterprise on the other 20 per cent which presumably come in through the back door with users carrying them in on discs and laptops and loading them onto desktops?**

**PE:** The recommendation would be the same. Whether or not it's from documents being passed around or whatever, companies need to take steps to protect themselves.

One other interesting way to look at this is that the same thing that applies to any OS: the due diligence required for applying appropriate email policies for instance; company data as far as the Data Protection act is concerned, and also in regard to the threat from internal attacks from disgruntled employees (and ex-employees)...

**LXP: Is that on the rise?**

**PE:** We don't have any figures on that, but because of the state of the economy, it is likely to become a higher risk.

**LXP: I imagine it's difficult to get data on because in most cases it won't be reported.**

**PE:** And also with regards to attacks revolving around company sensitive information...

**LXP: What about everyone's current computing problem: the huge volume of spam?**

**PE:** On the spamming side of things, you've probably seen the reports yourself. There was one from Aberdeen Consultancy Group, that 50 per cent of volume traffic is spam-related. Here is a big area of concern to customers. It's easy for email addresses to be forged, for email addresses to be harvested – all at virtually no cost to the

spammer. What we do is not only the traditional white and black lists, but also heuristic scanning as well.

**LXP: Your press releases mentioned Domino. Is this a solution that works with other mailservers?**

**PE:** In regards to heuristic scanning, that's a gateway service SPS, so it runs independently of the customer's mailserver systems.

**LXP: Who do you see as the main customers for these solutions in particular?**

**PE:** In the enterprise space I'd say certainly the government sector – regional and some central, NHS and councils as well. Also the financial services sector. The other

**“From January to November 2003, there were 16,800 malicious threats (viruses) to Windows, 500 for Linux and 21 for Unix.”**

sector would be SMBs, but I think that's more of a gradual evolution. We clearly see Linux moving to mainstream. If you look at the big server players leveraging Linux, it seems inevitable that it will be mainstream before long.

**LXP: Do the products and services differ between the Linux and Windows services?**

**PE:** As far as our products are concerned, not at all. Our customers can expect the same level of antivirus, content filtering and anti-spam capability irrespective of whether they are a large enterprise, or an SMB on Linux or Windows.

**LXP: So it doesn't matter who you are or what you are running...**

**PE:** The only caveat to add is the products we offer are specific to certain distros and kernel versions. We do cover Red Hat and SUSE distros, and possibly some others. ■

[www.trendmicro.com](http://www.trendmicro.com) acts as a portal to Trend Micro's many localised services – just select your region from the drop-down list top right.





# Cool blue reason

**Y**ou need your hardware to handle your growing capacity. You need to make your team of admins stretch further. You need to keep your software up to date, and you need to do so with no downtime.

Furthermore, you need to do all this on a shrinking budget. Choose a better option? You should be so lucky: that 'solution' you bought is looking less and less like a single system every day, and you're probably already sick of people telling you how it's "so-o-o-o 1990s" to have in-house specialists on hand to keep your machines well-tuned.

Six months ago, we looked at the Navaho TeamCAT appliance, a small, blue unit that offers web server, email, spam and virus filtering, firewalling and VPN, and much more – all in one, self-contained, Linux-based box. Back then we gave it a *Top Stuff* award because we felt it was the best stress-free computing option on the market, and since then Navaho has gone from strength to strength by enhancing its CAT appliance range and even adding a new model. The MediaCAT system launched in January 2004 and makes network media content delivery a breeze thanks to its incorporation of the very latest video and audio technology.

More recently, Navaho has expanded its educational operations in conjunction with Study Support Centres around Britain – out-of-hours schools sponsored by the local football/rugby club that help provide extra schooling to young children who need it. Each of the kids gets their own email account and learns to use various applications on their computers to help them improve their IT literacy, and also their general knowledge. Naturally, this isn't a high-tech IT deployment by any means, which means that the solution in place needs to be completely administered by people with little or no IT training – no easy thing to accomplish with such demanding end-users.

**Navaho appliances are top of the league when it comes to all-in-one servers, as PAUL HUDSON found out...**

Putting children and computers together is usually a recipe for disaster, and not only because they have a tendency to break things. From an administration point of view, kids are a big problem simply because, above all, they need protecting from the darker side of the Internet. As well as spam and pornography, there's also the issue of viruses – it's one thing to tell employees to be wary about 'emails', but explaining the same thing to a child interested in opening mickeymouse.exe is, well, more than somewhat akin to the difficulties we all faced telling office workers that random emails saying 'ILOVEYOU' probably weren't genuine.

## The Saints go marching in

The Saints Study Support Centre (SSSC) was a plan conceived in 1999 by Southampton FC in conjunction with Southampton City Council and the Department for Education and Skills, to provide a safe learning environment for children who could struggle in a normal teaching environment. To provide the server back-end, Navaho was called in to secure the existing network within a tight deadline, while keeping it user-friendly.

The SSSC laid down a set of requirements for Navaho to fulfil, which included complete firewall security, Internet and email content filtering for all users, anti-virus software, as well as full remote access capability. Particular emphasis on the fact that there would be a lack of staff available to administer the technology that was installed meant that the solution had to solve a variety of problems in one shot and simultaneously had to require little to no local maintenance.

NTL had already put in place a high-speed broadband connection to get the entire centre and all students online, and to leverage that connection to the full, Navaho and the SSSC agreed to go ahead and deploy a TeamCAT device under the catchy slogan "With the CAT in the way, the mice



can't play". The device was set up to web calendaring and email, as well as the core security applications such as firewalling, spam filtering, content filtering, and also user logging and auditing.

This all-in-one solution ensured that the entire network was safe behind a firewall, that all inbound Internet and email content was being filtered before users saw it, that email, files, and calendar information was available externally both to teachers and students, and that new accounts were easy to create for the local administrator. This last item was particularly important, as the manager of the SSSC, Chris Meech, said that she was "particularly pleased with the ease of setting up new email accounts, on the TeamCAT, as students are constantly changing".

## Big CATs

One of the key advantages of the CAT solution developed by Navaho is that it was designed for user friendliness at the core. Telephone and email support comes as standard with all machines between the hours of 8am and 6pm, which means that you can call Navaho at any time during business hours if you have problems or queries, and their support team can guide you through. Companies with more demanding requirements, particularly those who, like SSSC, have no on-hand IT administrators, can also opt for the advanced support option, which includes 24/7 automatic online monitoring and fault resolution as well as the standard telephone and email support.

For even greater certainty of high-availability, each CAT appliance can be clustered with another unit to provide automatic failover recovery in case the first box has problems. Using this two-way clustering, the slave box records the presence of the 'heartbeat' of the primary box, and stands ready to take over in case the heartbeat (network ping) fails. With each TeamCAT able to handle up to 500 simultaneous connections, it's no surprise that many companies opt for the failover recovery box in addition to the standard server.

The question is, if one box can handle so many accounts with so many potentially troublesome users in computing environments such as the SSSC, and all with little or no maintenance, what can it do in the enterprise environment?

## Choose your level

Internally the CATs are quite complex beasts – even if you choose the advanced level of technical support, you can still exercise complete control over the unit through its online management system if you want to. Despite fitting into just 1U on a rack, even the most basic CAT system (the NetCAT) offers bulletproof security as standard, HTTPS configuration, an intelligent proxy server for caching and accelerating web connections, full web auditing and content control, as well as file sharing, DHCP, and VPN support all as standard – and that's just the most basic machine!

The high-end TeamCAT machine chosen by the SSSC includes groupware-oriented extra features such as meeting planners, team calendars, mailbox sharing, and also online 'WebFiler' file sharing for authorised users – all of which runs on a rock-solid system that uses proven reliable technologies based on Navaho's custom Red Hat kernel to ensure that



your business is in safe hands. Furthermore, each of the services offered by the CAT series is as standards-based as the kernel, meaning that standards-compliant desktop software running on any platform can make full use of its capabilities – whether it be *Microsoft Outlook* on Windows, *Mozilla Mail* running on Linux, or *PINE* running on Solaris.

## The final score

To get an overview of what Navaho's CAT boxes are best suited to, which business would most benefit from a CAT deployment, and how Linux helped Navaho piece together such a successful system, we spoke to James Acketts, the Operations Director at Navaho:

**"If one TeamCAT box can handle so many potentially troublesome users at SSSC, what can it do for your enterprise...?"**

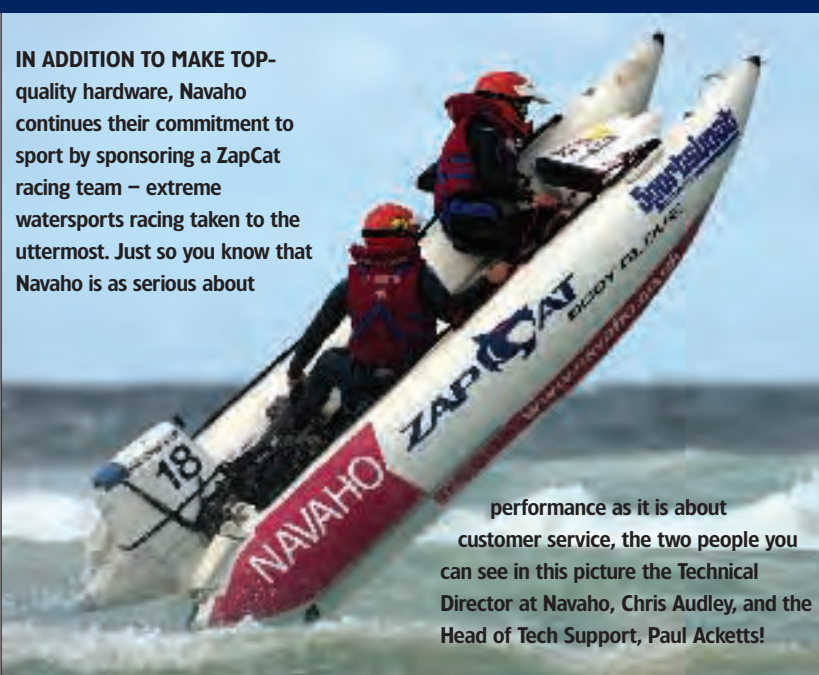
**LINUX PRO:** What's the range of hardware that Navaho offers?

**JAMES ACKETTS:** The existing range of CAT (Complete Appliance Technology) server appliances



## ZAP CATS

**IN ADDITION TO MAKE TOP-quality hardware, Navaho continues their commitment to sport by sponsoring a ZapCat racing team – extreme watersports racing taken to the uttermost. Just so you know that Navaho is as serious about**



**performance as it is about customer service, the two people you can see in this picture the Technical Director at Navaho, Chris Audley, and the Head of Tech Support, Paul Acketts!**

WWW.GINGERPIX.COM

## NAVAHO

« consist of three 1U half-depth Internet server appliances, NetCAT, MailCAT and TeamCAT. These have just been joined this month by our new MediaCAT media player solution (see below).

### **LXP: And what kinds of businesses are each of those targeted at?**

**JA:** NetCAT is the entry-level appliance for smaller networks. This is really for the small business that is still using single modem dial-ups and POP mail accounts and wants to move to a central Internet access solution.

The MailCAT is our mid-level appliance aimed at the SMEs that want an integrated mail solution that is remotely accessible, but does not need the more complex features and functionality of the TeamCAT hardware.

Finally, the TeamCAT is our top-of-the-range server appliance aimed at the more demanding businesses that want fully integrated email and groupware functionality, along with fax and SMS from the desktop and remote access for staff on the move. We've just launched a new product, called the MediaCAT – it's an entirely different animal to the other three and is a separate media player and delivery device aimed mainly at the commerce and retail sectors.

### **LXP: What are the main problems that the NetCATs, MailCATs, and TeamCATs solve?**

**JA:** The three Internet appliances provide an all-in-one-



**James Acketts,  
Navaho Operations Director..**

solution with an easy-to-use management interface, with powerful auditing tools, allowing quick and easy reporting on usage of the system thereby reducing the time and effort required by a business to look after it. In addition, the MailCAT and TeamCAT also provide remote access to mail for people on the road, while the sharing and remote file access capabilities of the TeamCAT make it a complete solution for the demanding business user.

### **LXP: What are the key business benefits people cite after installing one?**

**JA:** The key benefits our customers cite is the reduced overhead of managing their Internet and email provision, the reduction in non-work-related web surfing, and the improved productivity generated from the remote access and fax/SMS features of the TeamCAT.

### **LXP: What kind of technical support do they get?**

**JA:** We offer two levels of technical support with our products. Our standard support includes telephone support during extended office hours (Mon-Fri 8am-6pm) and email support at all other times. A Managed support solution is available as an upgrade and includes automatic troubleshooting and resolution of issues that may be highlighted from time to time by our remote monitoring system. Customers also have access online via the dedicated support website to a private area where they can view and add to support tickets, as

## THE ALL-NEW MEDIACAT APPLIANCE

Give your system nine lives!

FROM JANUARY 2004, NAVAHO WILL BE expanding its award-winning CAT appliance range with the addition of the MediaCAT – a network media content delivery system, incorporating leading-edge video and audio technology and combining this with powerful network integration and connectivity features. Much of the functionality was developed based upon feedback from clients who were already using other CAT devices, which meant that Navaho have been able to build a system that has an easy-to-use management system together with the simple set-up and implementation, which makes the MediaCAT a versatile system ideally suited to the delivery of a wide range of material.

Based on Navaho's own existing Linux kernel, the MediaCAT incorporates a powerful local and wide area distribution system, with a 'master' MediaCAT able to distribute content to others via local and wide-area networks or over the Internet. The end result is a chained network of media units that allow customers to easily get multimedia content across to their audience from a central location – a task that department stores, restaurant chains and areas of public information such as airports and hotels will likely be particularly interested in.

What each of these areas has in common is the need to play out advertising or customer-facing information in their outlets, with the special proviso that the content might change frequently. As a result, it becomes a distinct advantage to run the whole system remotely across the Internet, with content being sourced from a central location, *eg* Head Office. By default, the MediaCAT includes full support for popular video formats such as MPEG and AVI, as well as web-gearred display formats such HTML,

Flash, and JPEG, meaning that you are anything but restricted in what you are able to display.

Despite having such power features ready to revolutionise the way in which most companies distribute their marketing materials, the MediaCAT is based on much of the same management functionality that Navaho has developed to a fine art in its other CAT devices, which means that the control and management of the devices is kept simple enough for non-techies to use.



**Navaho's MediaCAT performs as attractively as its case looks!**





well as being able to access FAQs and HOW-TOs on the product. Both support options include electronic upgrades to the software when they are released.

**LXP:** How much of the Navaho software is based on Open Source projects?

**Current Southampton FC Manager Gordon Strachan and SSSC Manager Chris Meech look on as their young charges show off new computing skills – all thanks to Navaho and Linux!**

**JA:** The majority of the software is based on Open Source GPL software. For instance, the firewall in the NetCAT, MailCAT and TeamCAT is backed by iptables. Where we've written drivers ourselves for specific pieces of hardware (eg LCD panels), we've released these under Open Source licences. Similarly, in cases where our developers fix broken code in drivers etc, this gets submitted back to the maintainers.

**LXP:** Has the Open Source nature of the software been a big advantage for Navaho?

**JA:** Its greatest advantages have been the provision of a stable OS that we can adapt to our needs and requirements. This has enabled us to make a very powerful solution on a compact platform. The speed at which security patches are released for Linux has meant that we have been able to supply almost instant security patches and updates for the packages we use and keep our appliances safe and secure. Where patches are not available or fixes to bugs have not been released, it has enabled us to make our own fixes and changes to overcome the problem rapidly ourselves.

**LXP:** So what are your plans for future products?

**JA:** We have a number of tweaks and enhancements that will appear in the existing product range. We will be releasing a new security appliance into the CAT range to replace our existing managed firewall product early next year. ■

## How it works

The killer feature of MediaCAT, beyond its easy-to-use interface, is that you can chain them together in such clever ways to ensure you get the latest content out to all devices in the speediest possible way. As mentioned already, MediaCAT works by distributing content across a network of your choice from the master device to slave devices, which may well be across the world. This isn't a new idea at all, however the manner in which Navaho has implemented the content delivery is very clever indeed, and involves what Navaho have named 'reflectors'.

Consider for a moment how a MediaCAT system might work in a (fictional) large fast-food chain called Burger Lord. Each restaurant in the world – and there could well be thousands – would have a slave MediaCAT hooked up to their display outlet of choice – probably a plasma screen. At head office, there would be a MediaCAT on which the latest content was ready for rollout, and rather than try to send out the same content to thousands of slave MediaCATs the master instead contacts special MediaCAT servers dotted around the world, of which there may perhaps be 100 – 20 in the US, 30 in Europe, 30 in Asia, etc. From there, each of these reflector MediaCATs

continue the rollout to the slave MediaCATs in each restaurant, which means the overall bandwidth required is spread across the entire world rather than bottlenecked at head office.

This technology is further improved thanks to the smart logic Navaho has encoded into the MediaCAT reflector servers – if one is detected to no longer be on the network (perhaps its local telecoms exchange is down), the master system will take charge and order the other functioning reflectors to automatically compensate and spread the load so that all the slaves still get their updates.

## Security, standards, and stability

The MediaCATs were designed to operate in even the most hostile environments, which means they have a barrage of features to ensure that the content being delivered is safe even as it travels across the network. Using standard networking protocols, such as TCP/IP, the MediaCATs are able to work across closed local area networks or between more distance locations via leased lines or even the Internet. To make sure this transfer is completed safely, all traffic between MediaCAT units is authenticated and encrypted, which avoids the hassle of having to set up a virtual private

network for communication over the Internet.

The content rollout can, for more advanced users, be configured to send different content out to different slaves so as to provide custom content to certain groups of people. For example, in a Burger Lord's restaurant on the West coast of the USA they might be showing the breakfast news, while the Perth restaurant could be showing evening news or might perhaps have already powered off for the night. In addition, administrators can request for automatic warnings to be sent to them if any network problems are discovered – units who don't receive a media update, for example, can report the problem back to the master unit for the attention of the administrator.

One feature of the device that may prove to be its biggest success is that each MediaCAT has video input capability, allowing customers to include live footage or TV feeds alongside their own media. This is complemented by advanced audio technology, including digital optical out ports that enable customers to provide compelling audio to back up their visuals.

Is the MediaCAT the way forward for intelligent multimedia delivery? We think so, and this is likely to be one product that the market will jump on and make the most of.

## ENTERPRISE CASE STUDY



Finding a great deal with Linux and...

# Superquote.com

**D**uring the Internet boom, much attention was paid to startups that came up with creative uses of the burgeoning technology, and those claiming they could make profit from 'simple' search and introduction operations were showered, for a time, with venture-capitalist cash. Many didn't last much beyond the launch party. However, some still believe this model – allow users to search many providers to find the cheapest deal in return for a cut of what they eventually spend – is still valid and is maybe the most appropriate use of Internet technology.

One such individual is Simon Clewer, who launched [Superquote.com](http://Superquote.com) in 1999 with the single-minded intention of giving his users the simplest way to search the UK's top car insurance providers and find the keenest price. This is no easy task considering the arcane methods the average insurance company uses to divine premiums, but it is one Superquote manages with aplomb. And while it is not uncommon to hear of enormous e-commerce operations such as [Amazon.com](http://Amazon.com) migrating their systems to Linux and other Free or Open Source software, Clewer had the foresight to *start* the entire enterprise around the Linux, *Apache*, MySQL, Perl (LAMP) quartet. Into the bargain, Clewer's company has become a high-profile advocate of the architecture hoping to 'further the free software revolution'.

#### **Linux Pro:** What made you opt for a LAMP solution?

**SIMON CLEWER:** It seemed to offer the best combination of price, stability, security and performance for the way we wanted to work. Despite insurance being the 'family

**Searching out the best deals on motor insurance can be a tedious, long-winded task. ANDY CHANNELLE chews the fat with Simon Clewer, the founder and MD of Superquote.com, who thinks that the Internet and some sound Perl skills could change all that...**

business', [Superquote.com](http://Superquote.com) is actually a technology company and beyond the role as introducer we have no relationship with either customer or insurer. So I find myself presiding over a roomful of software techies.

Obviously the cost of acquiring and supporting Linux is a factor. The market for car insurance renewals is surprisingly small – industry figures suggest that we're all competing for about five million customers per year – so we have to make sure the entire system is cost-effective.

#### **LXP:** Did this influence your choice of distribution?

**SC:** From the very beginning we opted for Debian instead of one of the more 'commercial' distributions and, being a tech-savvy company, we've yet to encounter a problem we couldn't solve. Debian is cool – the Debian guys are simply trying to do it as properly as humanly possible without consideration to money, and it shows in ways that are hard to describe.

We made the switch from PostgreSQL to MySQL – it seemed to be the way the development community was moving – in 2000 and since then, the only time anything went wrong was when we did something wrong, in this case shutting down the machine while it was in the middle of a process. We won't do that again! Since we formalised the procedures for shut downs we have experienced very little in the way of problems. In fact, we've not lost a single byte of data in the last nine months.

We're using MySQL 4.0 (ver 12.20) but we'll upgrade soon to 5 because it has sub-selects and foreign keys. We're also still running *Apache 1.3* – because it looked like



mod\_perl with perl ithreads wouldn't work on version 2.0. Finally, we're using the testing version of Debian 'Sarge' because there were some packages we needed that are not yet in the stable release.

On the hardware side, we set up the live (and dev) server remotely, it's a matter of honour to us that we never go near our servers. In fact we did visit the server farm this August after we'd really spannered the box (first time ever that I've seen my machine in four years). I think it's a Cobalt RaQ – a thin blade sitting in a rack with lots of others and is 1.7GHz with 2GB RAM and two 20GB hard discs. There's a little LCD on the front that says [www.superquote.com](http://www.superquote.com), other than that it's the same as all the others and definitely NOT worth a trip to the Isle of Dogs to see it. Its blue! Our development server is in Reading, Berkshire.

**LXP: Experienced any problems with the setup?**

**SC:** Not really. It helps that the technology side is what I'm really interested in. So all the development work was – and is still – done in-house. Beyond the cost savings we've made from using Open Source software, there is a real value in seeing the effort we've put into the system paying off. I'm pleased with it both intellectually and financially and getting it to 'just work' – and work so well – is incredibly satisfying.

**LXP: Was security an issue or has it become so as the site increases its profile?**

**SC:** We've not had any major problems, though there's always the danger that some script kiddies will attempt to get in to the server under the wrong impression that there may be personal data on there. As I said, we have no personal relationship with our customers once they click the link onto an insurer's website. One thing we do worry about is the possibility that someone might try to 'steal' our mailer to use as a spam relay, but as long as we keep our passwords sensible and secure and monitor outgoing mail – 100,000 messages an hour would suggest something was not right – we're confident we're secure. The script kiddies always leave a trail too, so if they ever get into the system we'll know where to concentrate our efforts.

We've been 'hacked' twice, both times by spammers, though the second time they also uploaded some movies (probably porn) onto the server, but we found them quickly – I could just tell that the server was not happy, had a quick look and found them easily (a mystery user logged in). Both times they hid a spamming toolkit under a directory with a blank space for a name, but they're not difficult to find once you suspect that you've been compromised.

Of course, it is just sensible to make sure the entire system from webserver to database is efficiently patched when security alerts are circulated.

**LXP: How does the operation work?**

**SC:** Very simply. The user inputs the information usually required by insurers – postcode, make/model of car, accident and conviction history of each driver etc – into our site and then the software uses that data to interrogate the websites of a wide range of UK insurers to present a decent spread of quotes. The user can then click through to the insurer's own site to get the quote confirmed and purchase a policy.

We've concentrated on making the UI as simple and quick to use as possible. In particular we don't ask for name or telephone number or even an email address. I know that users hate to enter that sort of information into websites, probably because they suspect that it will be abused, and also because it is unnecessary effort.

**LXP: But [Superquote.com](http://www.superquote.com) is not a traditional insurance broker?**

**SC:** No, we're not a broker at all. Unlike some of the other online traders such as [www.peopleschoice.co.uk](http://www.peopleschoice.co.uk), which acts as an intermediary between the customer and insurer (taking a percentage of every premium), our relationship with the customer ends as soon as they click through to the insurer's site. When a customer then buys a policy, [Superquote.com](http://www.superquote.com) picks up a referral fee which can be anything between £10 – £40 depending on the partner. The actual transaction takes place between customer and insurer; we simply introduce them.

**LXP: What inspired you to make [Superquote.com](http://www.superquote.com) concentrate on motor insurance?**

**SC:** It really is a unique market. The element of compulsion in car insurance gives buyers a singular focus. Unlike home and contents insurance – which people tend to set up and forget – unless there's a drastic change in their premiums, motor

**"Beyond the cost savings of Open Source... there is a real value in seeing the effort we've put into the system paying off."**

SIMON CLEWER, SUPERQUOTE MD



insurance really inspires people to get out there and find the cheapest price. And, of course, a site like ours can save a lot of time and effort by automating much of the search process.

Also, people choose to insure their own possessions (house, health, life etc) but car insurance is insuring other people against damage you might do to them or their property. It makes a difference. The market for motor insurance is frenetic and dynamic like no other. Just look in the Yellow Pages at how much space is taken by the various types of insurance!

If you insure your house, you care about whether the insurance company will pay the claim, but the focus with car insurance is upon the peace of mind of being legal rather than being protected.

**LXP: Do you have any plans for Superquote to diversify into other areas such as home or personal insurance?**

**SC:** From the start the intention was to do one thing and do it really well, but with all the effort we have spent on development it would be a great shame, I think, to waste it. We've set up a second company called Spectre to investigate other ways to use the technology. ■

## NAS STORAGE — NEC EXPRESS 5800/120EF

# NAS Express

## Take your data storage system into the 21st century...

**F**or the past 15 or so, years in the computing industry, there have really been just two hard drive technology standards competing for the attention of consumers: IDE and SCSI. SCSI, standing for Small Computer System Interface, has long been seen as the deluxe option for hard drives, as the drives themselves have onboard logic to help them re-order data requests for maximum performance. On the other hand, IDE has always been reliant on the CPU to give it direction, which at first led to IDE drives (and later EIDE drives) having a reputation for poor performance.

It was only until the late 1990s when people started to wonder whether the parallel ATA/IDE standard that everyone was so used to was going to keep stretching beyond ATA133, and the end result of many discussions was a whole new standard, christened Serial ATA. Although not as fast as SCSI, currently at 320MB/sec, the first generation of drives are still able to throughput up to 150MB/sec, and this is set to double to 300MB/sec within the next year or so. The key advantage to SATA when compared to the older ATA drives that most machines still use – apart from the scalability issue just discussed – is that SATA uses a new type of wiring that's a great deal smaller than its parent technology, which allows many more drives to be fitted into machines without wiring becoming a problem. Compared to SCSI, SATA has all the same advantages as ATA, of which the most apparent is the massive cost savings – SCSI continues to be the most expensive drive system around, which puts the majority of SCSI systems in a price bracket of their own.

So, with SATA allowing better performance, increased drive clustering, and better long-term scalability than its predecessor, it's no surprise that SATA is becoming a viable choice for network-attached storage (NAS) devices – servers with a strong focus on the data serving capacity. We reviewed an Xinit NAS device based on SATA just a few issues ago, and found that it was indeed a great way to get NAS-level capacities at what is essentially

**Disk space as a commodity has helped fuel the drive towards network-attached storage for years. PAUL HUDSON wonders: "Can SATA give the industry a new lease of life?"**

**The Western Digital Raptor 36.7GB earned a respectable 8/10 when it was reviewed in October 2003's *Linux Pro*.**



a bargain-basement price. As a result, we weren't surprised to an all-new storage-targeted server land on our desk, this time from long-time big iron producers NEC.

### SATA OK

The Express5800/120Ef is more than just a catchy name – it's also an attractive generic server system from NEC that's powered by SATA, and, although you can put it to pretty much any task you please, the SATA slant makes it most viable for NAS. Inside the box is a dual-2.4GHz Xeon system with 512MB DDR RAM, a 16x DVD drive and floppy, and also an internal tape drive so you can backup your backups. Of course, there's the all important drive array in there – the model we received had four 80GB Maxtor SATA drives providing a total of 320GB of storage all routed through an SATA RAID card and thus can be set up as a single RAID array as necessary. As you'd expect, the CPUs powering this thing are largely irrelevant – the key concern is the speed of the drive array and the speed of the networking, both of which are above the norm in this system.

The price for this system is just £2,499 before VAT, which is largely thanks to the low price that SATA brings, and also of course partially testament to the buying power that NEC wields. Although any NAS device would perform better by switching to SCSI drives, we firmly believe this price point would be impossible using SCSI as opposed to SATA, which is what gives these devices such a firm niche. Don't think of 'inexpensive' as meaning 'cheap' – NEC provide a three-year on-site warranty with the server, which should be enough to satisfy everyone.

In many ways, the backing of such a huge company as NEC is sure to give SATA the legitimacy it needs to give it a firm foothold in the corporate arena – it has already carved a substantial footprint for itself in the home area where SCSI has never really taken off, and many are predicting it will be able to do the same in the enterprise. To tackle this problem head on, many hard drive manufacturers are offering business-class warranties on their drives that far



outstrip what you'd see on the equivalent consumer systems. For example, the Western Digital Raptor drives we looked at back in October 2003's *LXP* (pictured here) come with a five-year warranty, compared to the one-year warranty now commonly seen on consumer drives.

## Big push for NEC

Most NAS devices currently on the market are rack-based, and indeed the Express5800 is also available in a 4U rack format. However, the tower format of this machine is likely to make it a better option for small businesses without an existing investment in rack hardware, but it's also great for larger companies that want to distribute smaller servers around departments for group filesharing needs. Once you discount the cost of the hardware and the support contract, there really can't be that much margin here for NEC, which explains why there's very little inside the box apart from the machine, a keyboard and mouse, and a few short manuals explaining how the hardware works.

There were, interestingly enough, no OS CDs supplied with the unit, which we thought was odd until we noticed that the unit came with no OS installed either. Yes, this is a budget machine, but it does seem a bit stingy not to at least put a copy of Red Hat 9 on there (or similar)! Nevertheless, we installed Linux ourselves and all the hardware was detected smoothly – predictable, really, given that NEC aren't known for using non-standard or unusual parts inside their machines. Moreover, NEC has a history of strong support for Linux, and we wouldn't be surprised if this machine had to undergo extensive testing on a variety of Linux distros before it was shipped – this is NEC we're talking about, after all.

What's most interesting is that NEC is using the same Express 5800 product name to brand this NAS device: we reviewed a 1U rack server back in *Linux Format* issue 41, which was named the Express 5800/120Rc-1; whereas this server, a tower unit NAS device is the Express 5800/120Ef. Either NEC's marketing department have a hard time coming up with names, or there's some underlying product synergy in the Express range.

One minor annoyance of this machine is that it has a limited amount of drive space in there – the unit is locked down very tightly inside, so even if you *had* space for more drives it would be very difficult if not impossible to fit more. As a result, you're pretty much stuck with the hard disk configuration that it ships with – if you can get larger disks shipped in place of the standard set it will extend the lifespan of the machine. As it is, 320GB isn't likely to last all that long in today's data-driven environment.

## To the test

Four drives, striped without parity, is a very easy way to get very high performance. However all this goes through a 66MHz/32-bit PCI slot, which technically limits the throughput to the RAID card at just 266MB/s. Theoretically the SATA RAID card bundled is able to deliver 150MB/s to each of the drives, however that would require PCI bandwidth of 600MB/s to service all four of these drives

## PROS AND CONS OF EXPRESS5800/120EF NAS DEVICE

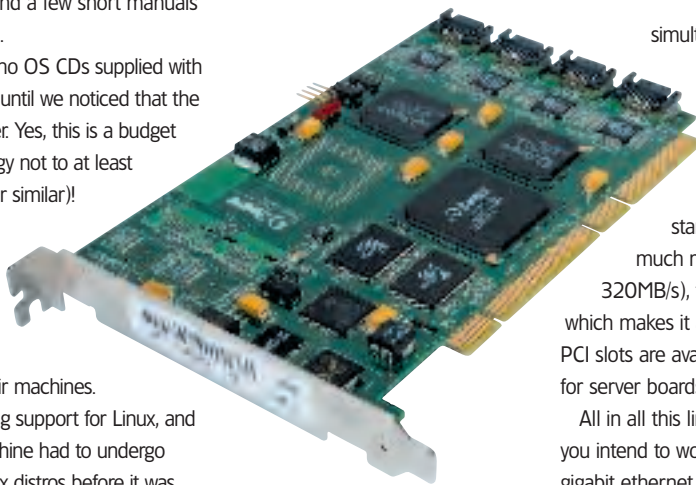
### Pros

- Relatively low cost
- Easy to maintain
- Scalable
- Easily understood
- No additional software required
- Solid 3-year warranty
- Low price thanks to SATA

### Cons

- Higher burden on IP network
- Not the best performance
- Complex backup strategies may become impractical
- Linux not pre-installed
- Under-powered CPU and RAM

**“Don't think of inexpensive as meaning 'cheap' – NEC provide a three-year on-site warranty with the server...”**



**The 3Ware Escalade 8506 SATA RAID controller supports Linux using a selection of supplied drivers, or the one found in the kernel, meaning that RAID arrays can be recognised as SCSI devices by Linux.**

simultaneously, as would be required in disk striping, which is simply impossible with the PCI bus supplied.

Of course, it's not likely that each of the drives would be able to handle the 150MB/s a second dictated by the SATA standard – 70MB/s or 80MB/s a second is much more likely. Even at that rate (280MB/s to 320MB/s), the card would be underfed by the PCI bus, which makes it an odd choice given that 64-bit 66MHz PCI slots are available and indeed are much more common for server boards.

All in all this limitation is not likely to be noticed unless you intend to work your server hard. This thing has a single gigabit ethernet card in there, which means you're going to get data transfer speeds of around 800Mbits/s under average conditions, which works out at 100MB/s – well below the operating capacity of even the current disk solution. Every system has to have a bottleneck, and in this circumstance it will probably be the networking two thirds of the time, and the hard drives the rest of the time.

Nevertheless, it's important to remember that this is a fairly low cost solution, and for £2,499 you're getting a lot of value here. It's not a record-breaker by any means, partially because it's using SATA rather than SCSI (a choice validated by the very low price), partially because it has just one gigabit card and a RAID card attached to a 32-bit PCI slot, and partially because you're limited to just four drives. However, you're not likely to find much else in this price-bracket simply because of the economy of scale. If you're willing to spend more money, Xinit produces an out-and-out NAS device (reviewed in *Linux Pro* December 2003) with more CPU power and RAM, as well as 3 terabytes of disk space (ten times the capacity here), and Xinit'll also provide you with a solid Linux installation of your choice to boot.

Although you can put this Express5800/120Ef machine to other uses, the box is simply too big for high-performance computing, and you'll be hard-pressed to find server-side applications that run happily in just 512MB of RAM. As a result, this machine is destined for the low-end NAS world, a role that it performs well at as long as you don't mind the somewhat limited capacity. ■