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WELCOME

The **Linux world** is changing, and nowhere was this clearer than at the recent Linux Expo. Whereas in days gone by you might expect these to be the almost exclusive reserve of hackers, these days the suits outnumber the leather jackets. And that is not a bad thing.

Though some may hark back to the day when Linux was unsullied by even the slightest hint of commercialisation, it is an inevitable consequence of our favourite OS

'growing up'. And apart from money, these companies also bring with them wider recognition and support, which benefits us all. Indeed, most of the top open source developers are more or less subsidised to continue their work by such companies. And commercial interest is spurring on all areas of Linux development, from the kernel itself all the way up. You can find out more about what transpired at the New York LinuxWorld Expo in our special report starting on page 12.

The theme of serious Linux use is continued in our main feature this issue, where we look at some of the barriers people claim block their adoption of Linux as an OS for business and professional use – we'll be exploding a few myths, but also looking at some of the genuine problems that organisations may face while trying to migrate to Linux. We have looked at two very different companies here, and I'm sure the mail will flood in from others with comments or questions on this subject. The feature starts on page 49, and includes some handy hints on Linux software that can make your office life easier.

If all that sounds too much like hard work, you could take a gander at our special roundup of open source Linux games on page 34, which includes a whole slew of different genres. Reviews-wise there's the new SuSE PPC, *Volition*, *TeamWare* and more, and if you're a desktop user, be sure to check out our four page guide to customising *Konqueror* starting on page 79.

Nick Veitch
EDITOR



Running Linux just makes sense - p49

WELCOME | intro

The aims of this magazine...

Linux Format is a magazine dedicated to Linux and the Open Source community. The aims of this magazine are quite simple:

- To promote the use of Linux by providing friendly, easy to follow guides to installing and using this operating system.
- To help our readers get more out of their Linux experience, through our tutorials, features and advice pages.
- To provide Linux users with accurate and unbiased information.

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NEWS

Smooth fonts in KDE, Nautilus heads for ubiquity, Java and Linux on the road, great news for gamers, and the first significant Linux virus attack...

KDE 2.1 looking good

Braving the cold northern climate, **Simon Goodwin** travelled to Norway to meet with Matthias Ettrich and Brad Hughes, two leading lights in the KDE development team.

The next version of the free Linux Desktop Environment *KDE* will be the first to support dual-head displays, allowing simultaneous display of two or more screens generated on a single system. It also makes smooth anti-aliased characters readily available to all applications, and incorporates stacks of updates, fixes and improvements after feedback from users of the first *KDE2* release.

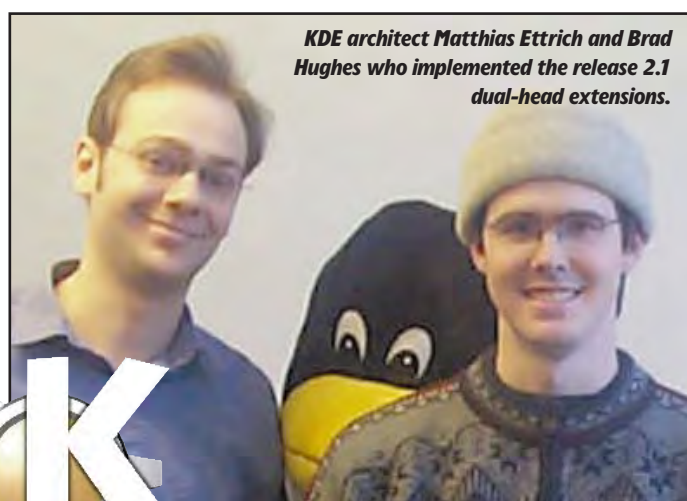
The dual-head extension should suit anyone who needs instant access to more information than will comfortably fit on one display – designers can put their main image

on one screen, for CAD, DTP or sequencing – and keep tools, entry and status windows on another display. It's keenly awaited by German stock-market traders who already use *KDE* and have been running out of screen real-estate on their systems for price and trading information.

Dual-head support is cool for coders too, as they can have application displays on one screen, as a user would see it, with graphical debugging on a second integrated *KDE* display.

Dual-head output is ideal for those who own cards like the Matrox G400 with two synchronised SVGA outputs, and if you have the slots to spare you can potentially spread your *KDE* desktop windows over more than two screens.

This sort of extension could help *KDE* take Linux into niches such as security, compositing and public information terminals. One developer has successfully tested a three-screen setup on a single Linux box – but the



KDE architect Matthias Ettrich and Brad Hughes who implemented the release 2.1 dual-head extensions.



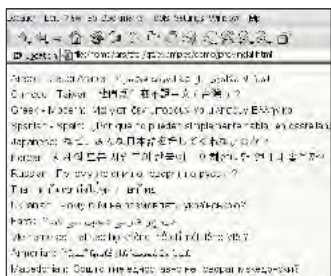
practical limit is determined by hardware not software expansion.

Smoother text

Another of the advances in the next release is real font anti-aliasing which makes text displays much easier to read, especially in small sizes and for non-ASCII character sets. *KDE* sets the pace among Linux applications by using Unicode internally; the European development focus makes accents unfamiliar in the USA a fact of life, but the team has gone on to implement fonts more familiar in the eastern hemisphere, where ASCII-dependence has hitherto held Unix-based systems back.

The software layers in Linux determine whether or not your text gets the new look. TrueType and PostScript fonts are rasterised by *FreeType*, then *KDE2* applications use a tweaked version of the Qt GUI toolkit to generate glyphs in up to 256 shades, rather than just two.

These are just a few of the more visible changes in the new release, but there are plenty more under the surface. We intend to have the full version 2.1 release of *KDE* on next month's *Linux Format* CD, and a feature about the update and the team in the magazine. Meanwhile, if you can't wait, you'll find more information at the *KDE* website: <http://www.kde.org>



Anti-aliased fonts beautify displays in Konqueror and KDE.



Character-set support is much improved in the KDE 2.1 update.

Red hat jump on the EAZEL BANDWAGON

Eazel continue their meteoric rise with a new strategic announcement, this time with the world's biggest Linux vendor, Red Hat.

The two companies will join forces to offer 'an integrated solution combining *Red Hat Network* with Eazel's suite of Internet services for individual users.' In practice this means that the next versions of Red Hat Linux will have the *Nautilus* desktop integrated into them, providing 'a superior user experience' coupled with the renowned security and scalability features of *Red Hat Network*. The deal will also see Eazel featuring official Red Hat RPM packages within its innovative

Software Catalogue service, allowing access to them from the *Nautilus* Network User Interface (NUI).

Eazel have signed up to a number of alliances over the last few months, including securing a major cash injection from Dell – who will ship their Linux desktop PCs and laptops with *Nautilus* – and cutting a deal which will see the NUI become the default desktop on the next releases of Sun's Solaris OS.



Stan Christiansen, Eazel's General Manager of online services said this was an exciting step forward for the Linux desktop.

While Red Hat's Howard Jacobson claimed the deal could be instrumental in the creation of what he called the ubiquitous Internet by providing reliable, secure solutions at the lowest total cost of ownership. "We recognise that proliferation of these solutions requires not only reliability and scalability, but it also an excellent user experience."

News in brief...

Linux PPC, the company responsible for a number of successful Linux distros for Apple computers, have announced they're to become a Non-Profit Organisation (NPO). The move is intended to take the company back to its roots.

Popular download site **Tucows** have announced that they're to close down their BSD sites after criticism from the BSD community over inaccuracies. Tucows said: 'We have never been so vain as to consider Tucows a BSD authority. When Tucows gets something 'wrong' on the BSD site, we receive a barrage of angry comments.'

Toshiba have been touting around 2.5inch hard drives with a storage capacity of 30Gb. The devices are ideal for mobile devices as the are said to be able to stand 175G operational shock.

SourceForge.net have announced that in the year since their official launch they have registered over 100,000 users and 13,000 projects including *MySQL*, *KDE* and *XFree86*.

After the success of *KDE Studio*, **theCompany.com** have released a commercial version, *KDE Studio Gold*. The package includes all the tools in the original with a few 'consistently requested' additions.

Apple users will finally be able to purchase the BSD-based OS X from March 24th after an extensive public beta testing phase. Will users be welcome at Tucows?



The Indigo Desktop Magic Project for Linux is the brainchild of Eric Masson and is an attempt to port the seminal SGI Unix desktop to Linux. The aim is to allow easy porting of native SGI apps to Linux. See www.5dwm.org for more. ➔

Battle of the *PEDIAS

The Free Software Foundation have announced the launch of perhaps one of the most ambitious open source projects ever undertaken. Fearing the domination of online information and knowledge by a few subscription based services, *GNUPedia* was launched as an alternative to the likes of *Encarta.com*, *Comptonsonline* and *Britannica.com*.

In announcing the initiative, Richard Stallman wrote: "In the past, encyclopedias have been written under the direction of a single organisation, which made all the decisions about content, and have been published in a centralised fashion." He also suggested this way of

working didn't fit in with the ethos of the world wide web. "The free encyclopedia will not be published in one place. It will consist of all web pages that cover suitable subjects. These pages will be developed in a decentralised manner by thousands of contributors, each independently writing articles and posting them on various web servers."

One person who was shocked by the announcement was Jimmy Wales, the creator of *www.nupedia.com*, a free, open encyclopedia being written by a community of 2,500 volunteers.

Wales originally contacted



Stallman last year for advice on the licensing of his project. "He proposed that I should use the Free Document License (FDL)," Wales wrote. The pair agreed to a joint announcement of licensing of *Nupedia*, but then *GNUPedia* was announced with a similar name and mission.

The "Pediae are now in contact and trying to find a work around that will satisfy both parties.

Meanwhile, January also saw the launch of *www.wikipedia.com* which is an encyclopedia where, if you don't like the text of an article or think you could do better, you can rewrite or amend it yourself. It sounds like a recipe for chaos, but the developers are confident of success. All entries are covered by the GNU FDL.

News in brief...

→ **TurboLinux** have had a busy month. As well as cementing a merger with **LinuxCare**, the company have also announced a deal with **IBM** which should see them selling IBM's entire software suite. The two companies will share revenue on sales of software such as Websphere and Domino and split the marketing budgets.

Scientists in the USA have managed the amazing feat of **stopping** and starting light. Though one group had managed to slow it down to 38mph, light normally travels at 186,000 miles per second. However, two teams in Cambridge, Massachusetts have become the first to 'capture' light. The advance could have serious implications in the field of quantum computing.

Never one to stand still while the competition claws ahead, **Intel** have announced their first batch of 'Crusoe-like' processors. Intel claims its latest 500Mhz Pentium III chips are more powerful than **Transmeta's** effort and use less power. Transmeta countered by saying the chip, while faster when plugged into the wall, drops to just 300Mhz when the notebook is used 'on the road'.

NeuVis are trumpeting their new I-RAD Platform *NeuArchitect 3.0*. The system uses visual architectural tools rather than conventional programming to design custom applications.

Sun have settle their October 1997 lawsuit with **Microsoft** about the latter's Java licensing transgressions. Microsoft will pay Sun \$20 million, and will continue to ship products – those already available or in beta – containing Java technology for the next seven years. Both companies claimed victory in the dispute.

The ubiquity of the mobile phone could see **BT** phone boxes disappearing from the streets of Britain. Revenue from the boxes slumped by 37 per cent last year. The telecoms giant will cease production of new phone boxes, instead concentrating on multimedia terminals offering phone, 'net and text messaging instead.

CIPHER ENGINE

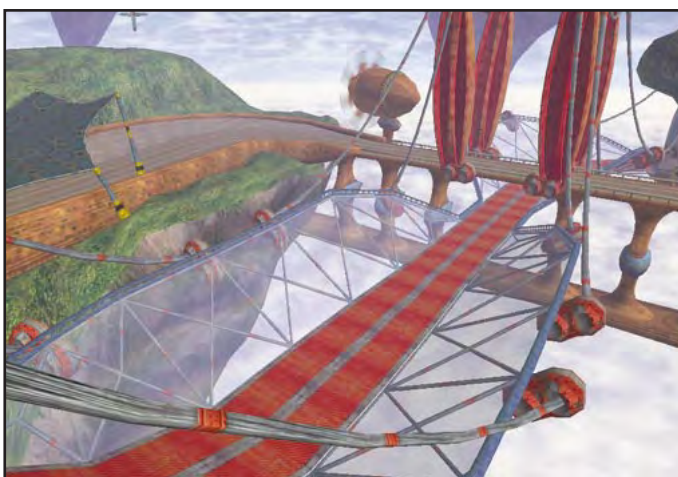
Synaptic Soup, the company formed from the *Evo* team and a few ex-Bullfrog developers have revealed plans for their next release. *Crazy Car Championship* may have a faintly embarrassing name, but it is the first game to be created using Synaptic Soup's new game engine, Cipher.

The biggest advantage of using Cipher is its multiplatform abilities

which should allow developers to create content for next-gen consoles, Windows, Mac and Linux with the least time and cost.

Though the company don't think they'll make much money on Linux products at first, their aim is to get as many people as possible playing the games online.

www.synapticsoup.com



Crazy Car Championship shows off the impressive visuals possible with multi-platform Cipher engine.

Noodles & worms

Virus writers are beginning to target the Linux operating system and, if the 'Top Ramen' virus is anything to go by, they're doing rather well at it.

The Ramen worm attacked a number of Red Hat servers (using Red Hat Linux 6.2 and 7.0) and replaced each site's main page with a picture of a packet of Ramen instant noodles and the message 'Hackers looooooooooooove noodles'. Although it's not destructive, the worm has proved to be an annoyance for webmasters who were hit.

Using one of the well known cracks in Red Hat's software, the worm copies itself onto its chosen host and installs another program

This site powered by



which closes the crack, replaces the website's homepage with the noodle logo and begins scanning the Internet for its next home.

The loopholes exploited by the Ramen worm have been known about for some time, and Red Hat released a patch for it back in September. However, many Linux users have fallen into the trap of thinking their machines were invulnerable and ignored the need for virus protection.

Experts are warning sysadmins that as Linux grows in popularity, it is more likely to become the target for ambitious crackers looking for a new home for their digital graffiti.

A free night at the Opera

Norway's Operasoft have announced that Linux and Mac users will soon get the same deal as their Windows cousins when they offer version 5 of their *Opera* web browser for free.

The self styled 'fastest browser on Earth' has previously been available for \$39, but the company decided to offer the Windows version as 'adware' – where a single advert displayed on the browser brings in revenue for the company. After notching up two million downloads in the first month, Operasoft declared the experiment a success and announced plans to extend the program to other platforms.

The Linux version of *Opera 5.0* is currently in beta, with plans for a full-scale release later in the year.

OperaSoft have also announced that their browser will be integrated in Sony's new Internet appliance eVilla (See LXF 11) which should also see the light of day later this year.

Fresh freshmeat

Freshmeat has received a Carol Smillie-style makeover after nearly two years in its old 'skin.' Patrick Lenz announced the new site, codenamed 'Verdi', and claimed most of the changes were due to requests from users over the past few months. 'One fundamental change,' Lenz wrote, 'is the replacement of the appendix by a project index.' This index is split into projects, branches and releases and should make navigation simpler.

Another big addition is web-based instant messaging which will allow registered users to send IMs to any logged on user through their personal page. This system will also let you know when – or if – a project you're interested in has been updated.

SuSE TRUMPETS 2.4

SuSE have stolen the march on their competitors by becoming the first of the major vendors to offer a version of their distribution complete with the 2.4 kernel. As usual, the company are offering two boxed products: SuSE 7.1 Personal and Professional (the former aimed at desktop or new users while the latter is for the server market). Though both products will also ship with 2.2 kernels to parallel the new release, this is the first distro to have 2.4 as standard.

The personal edition is designed to be set up and installed in under 20 minutes and features automatic hardware detection, menu-driven installation and the KDE2.0 desktop.

The professional edition – which comes on seven CDs or one DVD – boasts the same graphical installation tool as its personal cousin, but also comes with a number of extras aimed squarely at enterprise users including more applications with LFS (Large File

Size) support and a completely revised boot process that surpasses the current 1024 cylinder limit for the boot partition.

See our review of SuSE 7.0 PPC edition on page 22.

But Storm struggles...

Stormix Technologies – the producers of Storm Linux – have begun a process of 'reorganisation' as they face financial difficulties. The company appear to have filed for bankruptcy in Canada on January 17 2001, prompting a flurry of worried emails on the stormlinux-users-list. The news might not be all bad, as bankruptcy is often used as a holding measure by companies while they reorganise their finances or attempt to secure extra funding. However, many analysts regard it as a good predictor of 'corporate death'. At the Stormix website (www.stormix.com) it still appears to be business as usual with no mention of their financial problems.

REWARDING INNOVATION

One hundred projects have been chosen as finalists in the Win an MZ104 – Embedded Linux Design Competition being run by *Embedded Linux Journal*. The contest was launched last October and asked for projects built around products by Tri-M, ZF Linux, BlueCat and M Systems.

The one hundred chosen designs range from the visionary to the mundane, and finalists have until August 21st to bring their projects to life. After the deadline, projects will be submitted with detailed plans, photos, documentation and sourcecode, which will be released under a free license. The five winning entries will then be exhibited at the LinuxWorld Conference and Expo in San Francisco on August 28.



Pioneer 10.

Some of the more interesting projects include:

- Marco Alvarado's Pioneer 10 Star Router which will follow Pioneer 10 into space, relaying its steadily weakening signal back to Earth.
- Michael Ashton's Model 400 MIDI Sequencer which features a control surface with sliders, keys and lights for real time MIDI control.

WEB WATCH...

Space...

The final frontier. These are the experiences of a team determined to discover the best online storage options.

So, you've scanned in all your photos, downloaded every MP3 of Eminem Vs Britney Spears available, installed all your games and created the next big thing in the evolution of web design. By now, your hard drive may be feeling the pinch. But stop! Don't bin that precious scan of Rover the dog, sign up with one of these online storage services and add a little space to your setup.

www.Eazel.com
Eazel is the only Linux specific outfit in our quartet of providers, and they're also responsible for 'the



future of the Linux desktop', Nautilus. In fact, Eazel's web services – of which online storage is one – are tightly integrated into the Nautilus desktop. However, your account is manageable from any 'net connected computer equipped with a browser.

The basic service offers 25Mb of storage for free with a number of upgrade options.

www.X-Drive.com

This service is split into two parts aimed at either corporate or personal users. To use the latter you sign up to X-Drive Express which lets you store up to 25Mb (more if you sign up for some spam deliveries) of data in either public or

private folders. The public folders, which are a feature of most of these systems, allow you to share documents with friends or family and are great for letting people see your holiday snaps without having to get reprints done.

www.I-Drive.com

Public/private files are also a feature of this service, though at 50Mb it is the most generous of the four. I-Drive also allows you to stream MP3 files direct from your account, great if you have a permanent connection. I-Drive recently claimed to have broken the one petabyte mark (the equivalent of 1.7million CD-ROMs), a first in online storage. You'll need Netscape 4 or above to access the service.

www.yahoo.co.uk

Yahoo's Briefcase benefits from tight integration into the Yahoo search engine and can be added to 'My Yahoo' if you so desire. It can also be used for displaying photos to your best mates and is totally

browser independent.

The real value in these services is that it frees you from the tyranny of floppy disks, so if you need to transport files and a Zip drive is an extravagance, they're ideal. Of course, if you need more than 50Mb of storage, you can always sign up to all of them.

Random Link

www.flipflopflyin.com. Tiny little popstars for your desktop.

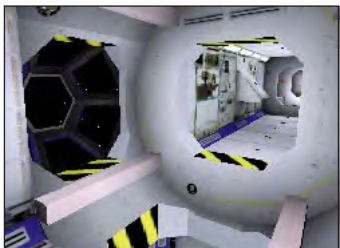
DO YOU HAVE A HOT NEWS STORY?

The best way to let the Linux world know about it is to have it appear here!

Email us your news: linuxformat@futurenet.co.uk

News in brief...

→ LXF's US sister magazine, *Maximum Linux* grabbed an exclusive chat with **Corel** CEO Derek Burney, in which he said Corel would continue making Linux applications as long as enough people were buying them. "There will also be a server version of the OS put out by Corel," Burney said. He also insisted that Microsoft are taking a totally 'hands-off' approach to their investment, claiming that emailed news of the OS sale didn't even illicit a response from them.



An Unreal view of the International Space Station.

If you've ever wondered what living in space would be like, you can get a taste of off-planet life with the *Virtual ISS*, a simulator created using the *Unreal* engine. The tour is based on an enhanced version of the engine created by **Unrealty**, an architectural visualisation company. A Linux version should be available as you read this. www.unrealty.net.

Were you worried by our recent report about **penguins** falling over as planes passed above them? Worry no more. Research scientist Richard Stone has spent five weeks in Antarctic watching the birds as a variety of aircraft flew over. "We saw birds moving away from the noise," he said. "Not a single bird fell over in 17 flights."

The **Samba** team picked up the annual \$25,000 IDG/Linux Torvalds Community Award at the LinuxWorld Expo in New York. The team received the accolade because of their efforts to bridge the gap between Windows and Linux/Unix. In his acceptance speech, team member Jeremy Allison said: "seven years ago I was porting Unix software to Windows NT. Ironically, now I'm porting NT software to Linux."

Get the full LinuxWorld Expo news starting on page 14.

Motoring with LINUX AND JAVA



Would you trust Microsoft to power your car? Or does that thought give you nightmares about endlessly reinstalling starter engines, windows opening and closing at random and a little paperclip icon offering driving tips as you attempt a three point turn. And let's not even think about unexplained crashes 16 times a day.

In fact, entrusting their lives to a hidden computer is something many drivers do every day now, but in the future the technology powering our cars will be much more visible than a engine diagnostic system or computer controlled braking. In five years time, Linux could be at the heart of your new dream machine.

One car manufacturer leading

the way is American giant Dodge which recently unveiled their Super 8 Hemi Concept Car. This 'all-American' sedan has been designed with the family in mind and features a state of the art Infotronic system. This will provide Internet-based 'infotainment, edutainment and entertainment services that meet the lifestyle requirements of each individual driver or passenger.' Steve Buckley, who was charged with bringing the concept car to life, said he has tried to create an environment that balanced luxurious heritage with the very latest in cutting-edge technology.

The car's computing needs are met by four single board computers each running a Java Virtual Machine on top of Linux. The software has been developed on a system called *deviceTop*, a 100 per cent Java device platform created by Espial. The system is controlled using advanced voice recognition – allowing the driver to control audio, climate control and phone system without taking their eyes off the road – with feedback provided by LCD screens mounted in the dash and seatbacks. The car also features realtime GPS



The very shiny 'Infotronic' centre.

data retrieval (meaning an end to 'Are we there yet?'-syndrome), Sirius satellite radio and a beamer device to load MP3s and MPEG movies from your home system while the car is parked in the garage.

The fact that the Dodge Super8 Hemi won't fly or hover its occupants to work will be a severe blow for many silver-suited futurologists, but does it really point the way forward for transport in the future?

Concept cars generally never make it to market, but the Super8 shows what is capable with technology available today – albeit at a high price – and a few of its less fanciful devices can already be seen in some 'luxury' cars, just as features such as CD players, climate control and ABS brakes were five years ago.

HP RELEASE LINUX PRINTER DRIVERS

Hewlett Packard have increased their Linux profile with the release of native device drivers for 44 of their LaserJet and business inkjet printers.

28 of the company's printers with Adobe Postscript will have full support for Linux, while the 16 without Postscript support will have basic Linux functionality. Martin Fink, in charge of HP's Linux development said: "We're aggressively integrating and implementing Linux across all our products and services."

HP have also been showing off *Hoverball*, an open source game that utilises OpenGL graphics acceleration on Linux. See <http://sourceforge.net/projects/hoverball/> for more information.

The road ahead for GNOME

GNOME developers George Lebl and Maciej Stachowiak laid out their plans for the future of the desktop at the Linux.conf.au conference in Australia.

After the excitement of 2000, which saw the launch of the GNOME Foundation and a slew of 'strategic alliances', 2001 should be just as eventful. The big goal that developers

are working toward is the release of version 1.4 which will see Nautilus replace GNC and the introduction of the *Medusa* search and index system, the GNOME Virtual File System and the *Bonobo* component model.

The pair also discussed the plans for Version 2 which should include support for *XRender*.

NUMBER
CRUNCHERThis month's totally
meaningless statistics

9

Languages that Mandrake's
website is available in.

47.6

Percentage of Internet users
worldwide who speak English as
a native language.

124

Scientific applications available
for download from
www.portalux.com.

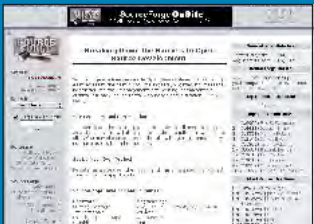
906

Uptime (in days) for
<http://sack.ees.com> which runs
on a 386/40 with 8Mb memory
and FreeBSD.

1134

Name of odd, unsuccessful
American industrial metal band.

93,511

Downloads of 'Photon' theme for
KDE from themes.org.

100,000

Developers supported by
Sourceforge during 2000.

453,597

Estimated weight (in kg) of the
completed International Space
Station (ISS).

89,016,121

Registered ICQ users worldwide.

275,000,000

Estimated number of wild
animals killed by Britain's nine
million cats each year.CRAY TWINS ALPHA WITH LINUX
IN LARGE-SCALE SUPERCLUSTER

The granddaddy of supercomputer makers have signalled their entry into the Linux market with the announcement of their Alpha Linux SuperCluster. The system is scheduled to ship in mid 2001, but Cray have already received an order for a 32 processor SV1 from BioNumerik Pharmaceuticals. The SV1 will be used to 'tackle even larger quantum chemistry problems' which, BioNumerik claim, will help them to create a new generation of cancer fighting drugs.

Cray Chairman, Jim Rottsolek, said: "The Cray SuperCluster Series targets

the need for clusters with higher capability than those available in the market today."

FASTER, FASTER

Not to be left behind, IBM have announced the 'world's fastest Linux supercomputers in Academia.'

In partnership with the NCSA, IBM will install two Linux clusters capable of delivering two teraflops of processing power.

"We believe that Linux clusters will will soon be the most widely used architecture for parallel computing," said NCSA's Dan Reed.

Windows migration via The Van

SuSE Linux have formed an strategic relationship with Virtual Access Networks to create a comprehensive migration tool which will allow network administrators to switch users from Windows to Linux with the least amount of fuss.

The core of this new arrangement is *The Van*, an application which can extract settings and data from old PCs.

The Van – which was awarded Best of COMDEX last year – has been created to allow users to switch from Windows to SuSE Linux without losing Internet bookmarks, wallpaper, address books and files. It also sports an auto-backup feature that takes a snap shot of the pre-migrated system for disaster recovery.

See www.pcmove.com for more information.

News in brief...

Filmmaker **JTS Moore** has spent the last year creating a documentary on the history of Linux. The film, *Revolution OS*, also follows open source advocates to Installfests and the Refund Day march where protesters attempt to get their money back for returning unwanted OSs.

Revolution OS was premiered in New York during the LinuxWorld Expo, but has yet to find a distributor.

Techweb's latest web tally suggests there are now 188 different Linux distributions – and one or two added each week. 25 of these are aimed at embedded applications, while nine are Debian-based and 28 are derived from Red Hat's distro.

Zelerate have announced a new deal with **SuSE** to bundle their *AllCommerce* suite of programs with the next SuSE Professional release. Did we mention that the application is also on this month's cover CD.

www.andamooka.org have announced another quartet of online books, including *The Cathedral and The Bazaar*, Eric S Raymond's examination of the open source ideal and *Underground* by Suelette Dreyfus. The Andamooka site allows users to read, annotate and discuss a range of books online. **LXF**

EMBEDDED LINUX NEWS

Pocket Linux 1.0 is finally out there and causing a stir in the embedded market. Transvirtual Technologies are touting the distribution as the world's first single application development/deployment environment for all resource constrained computing devices. Its biggest selling point is that it should allow developers to create mobile applications as easily

as they now create websites. See www.pocketlinux.com.

Hot on the heels of that announcement, Transvirtual also announced that *Jabber* (See page 60) would soon be available for the Pocket Linux platform.

Larry Ellison's New Internet Computer Co have launched NIC 2.0, a new \$199 Internet Appliance

running Linux, which also features MP3 playback, instant messaging and some games. The company think the biggest market for NICs will be Europe where Internet access is still regarded as a luxury.

Red Hat will be



supplying the embedded system for Delphi Automotive Systems which will allow cars to 'hook up' to the Internet. However, it's not Linux a the heart of this deal, but Red Hat's other OS, eCos.

Karen McNeil, Public relations boss for Indrema, recently went online to clarify a few issues regarding the certification process for Indrema games, hoping to allay fears that freeware or non-commercial developers would be priced out of the market.

Lineo have inked a deal with the Britain's Tao group to include their embedded Java multimedia kit in the Embedix SDK.

TIPS ✓ PROJECTS ✓ HELP FOR YOUR PC

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LinuxWorld EXPO

NEW YORK

31.01.01- 02.02.01



The Ximian (formerly known as Helix code) stand took the primate/jungle theme to its logical extreme.

Nick Veitch crosses the Atlantic to schmooze with the incrowd and bring back the scoops from LinuxWorld New York...

Though I was filled with expectation when I set off for the first LinuxWorld expo of the new millennium, the last thing I was actually expecting was to get my first show briefing at 37,000 feet somewhere over the Atlantic. A chance encounter with some guys from Borland brought me up to speed with all things *Kylix* before I had even arrived on the same continent as the Javits Centre in Manhattan.

The show itself was quite large, with nearly 200 different exhibitors, so I'm sorry if this report has missed anyone out, but hopefully it should give you a flavour of what went on.

SAMBA SCOOPS AWARD

The popular recipients of the LinuxWorld Linus Torvalds award were

the Samba team. The award comes with a large cheque for \$25,000 which will go towards continued development of the software. In a gracious acceptance speech, Andrew Tridgell said that he hoped in the future Samba would become unnecessary because everybody would be running Linux desktops and servers.

Most people who use Linux in a mixed network environment are familiar with the software which allows Linux machines to act as clients or hosts for Server Message Block systems, the protocol adopted by Microsoft for managing network functions by file transfer. What many users of the software might not be aware of is that the original author, Andrew Tridgell, was unaware that Samba would cooperate

so fully with Microsoft's systems – he wrote it to solve a specific problem relating to running Digital's Pathworks TCP/IP stack, which was incompatible with PC-NFS, a system he had been using for file sharing. The original Samba was written for a SunOS server, but was soon picked up by a young and flourishing Linux community.

Samba is still very much in development as it adapts to shadow the changes in the SMB "standard" as applied by Microsoft.

KYLIX LAUNCHES

Amidst some small pomp and ceremony, stirring music and a very welcome supply of cool bottled beer, *Kylix* was officially launched at the Expo on Wednesday 31st January. The



software was demonstrated to a captivated audience which seemed to be a real cross section of suits and classic Linux hackers. There was a genuine collective intake of breath as a simple application was constructed, compiled and run in a matter of minutes (the *Kylix* compiler really is super-fast). Much of *Kylix* centres around CLX, a component library which, while it takes after the system employed in Borland's *Delphi* and *C++ Builder*, has evolved to become more platform independent. The 165 standard components include GUI elements (using the Qt toolkit), but also stretch to a wide range of database and web functions, making *Kylix* an extremely flexible development tool. Judging by the reaction, this is a system we'll be seeing a lot more of.

The question as to whether Linux developers really need *Kylix* is an interesting one. Most Linux hackers are likely to stick with their current development environment, whatever that may be, but its existence does open the way for more applications development on several levels.

Contentiously, *Kylix* will give developers familiar with Visual Basic and *Delphi* the ability to create Linux applications without ever really understanding Linux itself. No doubt this will not be without some stigma being attached to the apps from Linux purists.

More importantly, its close relations to *Delphi* will mean that a host of already established applications can be simply recompiled for Linux with very little modification – a process which should become even easier when *Delphi 6* is released later in the year.

Does Linux need proprietary development solutions? Maybe not, but



it can certainly benefit from the volume of applications which already exist for *Delphi*, and by eliminating some skill/knowledge barriers for developers who wish to create Linux applications.

SOFTIMAGE FOR LINUX

While cruising past the AMD stand, the observant expo attendee may have noticed some interesting 3D animation going on. A closer inspection would have revealed that the cause of these pretty images was a dual AMD Athlon 1.2GHz machine running *SOFTIMAGE/3D* under Linux!

The animations on display were in fact frames from the recent *Godzilla* film (which was, needless to say, created with *SOFTIMAGE*). The 3D giant didn't have their own stand at the show, but they did provide the means to demo their product on the AMD stand. The Linux version looked no different to

any other version you might have seen, and seemed to be running very happily on the Athlon machine – but wouldn't anything with two 1.2GHz processors?

In a press release issued as the show was opening, Michael David Smith, product manager at Softimage claimed: "The addition of Linux to the

VA Linux had a strong presence at the show, and were responsible for the amusing billboard ad outside.

Kylix will give developers the ability to create apps without really understanding Linux

platforms already supported by Softimage products represent powerful, cost-effective new options for professional graphic artists. Linux is proving to be a robust production-ready platform and we're proud to be amongst the first companies to contribute to its success by bringing *SOFTIMAGE/3D* to Linux." →



FEATURE expo



This pair of robots were harassing anyone who came within a few feet of them.

→ EMBEDDED PRESENCE

Although Linux is pretty big in the world of embedded systems (see last issue's Linuxbots feature for example), there often isn't much visible presence at shows. This Linux Expo was an exception, though, as there were a number of booths exclusively dedicated to embedded Linux, and many other parts of larger stands devoted to embedded technologies, usually development tools.

One of the most impressive was ZF Linux Devices' stand, which was mostly dedicated to the cool (in more ways than one) MachZ x86 chip. Essentially, this is an entire PC on a single chip. While there have been other devices aimed at this market, the MachZ is truly remarkable in several respects.

For a start, it is a *full PC*, not just a processor with some extra stuff added on. It includes support for ISA and PCI buses, EIDE interface, and support for floppy, USB, IrDA, serial, mouse, keyboard, and I2C interfaces.

Even more remarkable, the chip runs at 128 MHz but consumes less than .25W of power. The demo board at the show was running at a relatively cool temperature (I couldn't burn my finger on it no matter how hard I tried), and of course, required no heat sync or fan.



On of the big announcements was the release of Kylix.

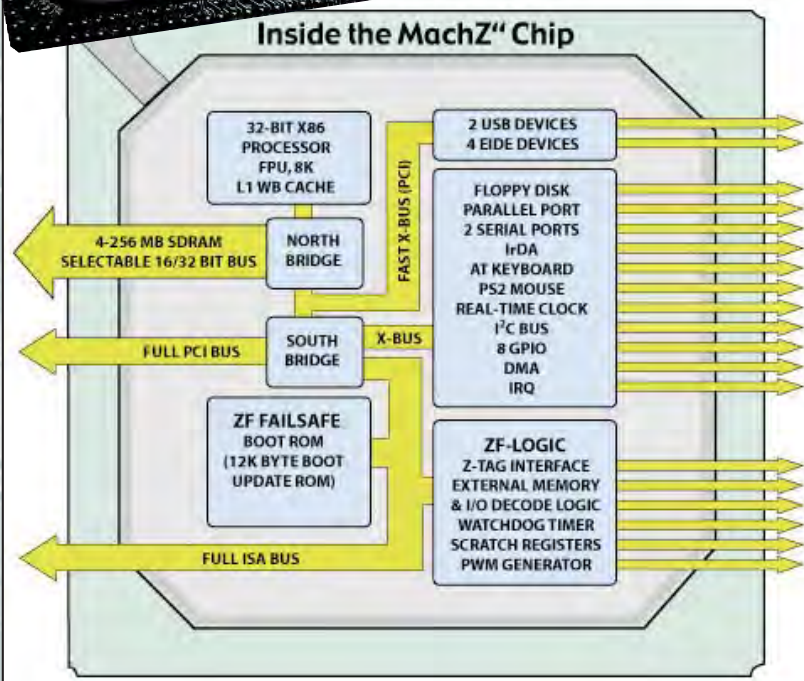
The low power consumption and lack of heat generated make it ideal for all sorts of embedded situations.

Further, the chip supports a 12k failsafe boot ROM, which can be used to bring the machine back to life in case of crashes or damage to the main system EEPROM – ideal for devices which need to be re-flashed remotely.

The systems on show at the ZF stand were running BlueCat Linux, whose creators, LynuxWorks (www.lynuxworks.com), also had a booth at the show. As well as Bluecat they were showing off a new product called *Spyker*, an event tracer and debugger tool for embedded systems. What makes *Spyker* pretty cool, is that it will work without any special hooks in the code, or a special kernel – instead

running from a single board, with a StrongArm SA1110 running different applications on both screens simultaneously. This is an ideal solution for all sorts of Point of sale/kiosk applications, and dramatically reduces the cost of installation.

Of course, Trolltech had a stand at the expo, featuring their embedded Qt (of which, more next issue) which, we have a sneaky suspicion, was also behind the Linux-running iPAQs on the Compaq stand. iPAQs are in short supply, as they seem to be flying off the shelves faster than Compaq can ship them at the moment. The iPAQs at the stand were running a variety of applications, including irc clients and browsers (with which we of course logged in to the *Linux Format* site).



The MachZ from ZFLinux is a complete, fully functioning PC on a chip.

it monitors the kernel libraries and application code as it is running, collecting time-stamped snapshots of what's going on, to enable easy identification of problems, bottlenecks and so on.

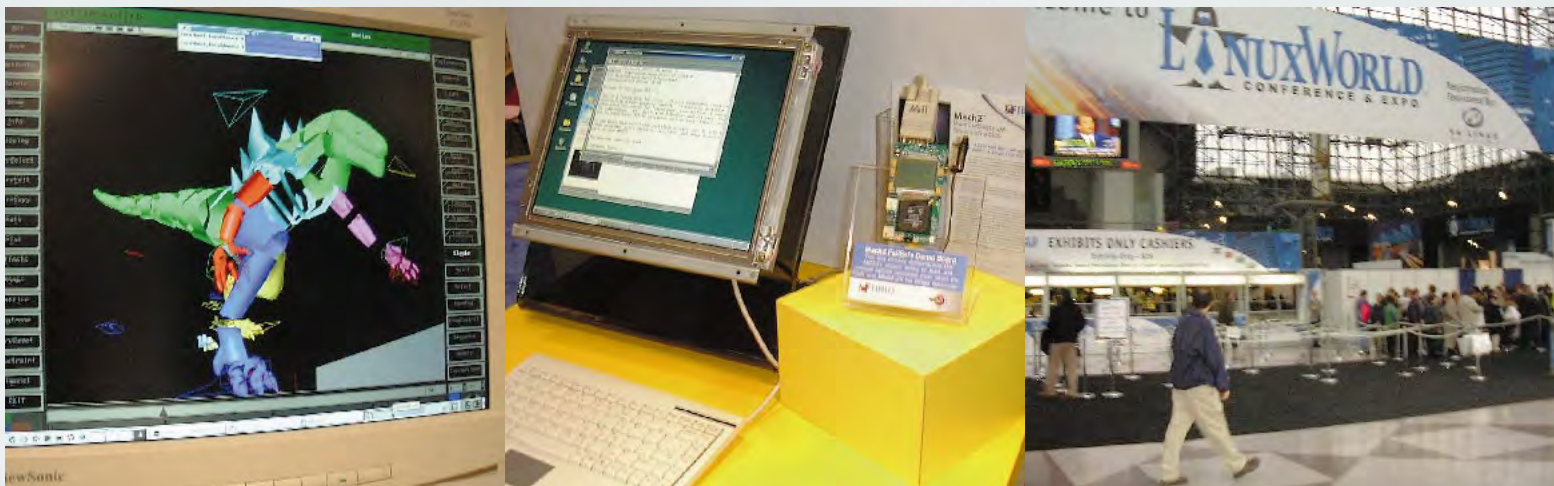
Also at the show, Applied Data Systems were demoing their embedded Linux solutions, which centre around a StrongArm processor running Linux and Microwindows to drive an LCD display. One of the most impressive units was the Tandem, a dual headed module

EVERYBODY LOVES A .ORG

A special .org pavilion was laid on in between the two halls of the show for the use of non-commercial Linux organisations. Plenty took up the opportunity, and the pavilion was a pleasant open-source haven between the two halls filled with increasingly commercial operations.

Among other interesting stuff there was the *Flightgear* stand, where an open source flight simulator was being demoed. This isn't just noteworthy because it is open source, it actually looks really cool, and graphically as beautiful as any Windows flight sim you may come across.

A few stands down I bumped into some guys from the Linux Terminal Server Project, who had an amazingly fast thin client setup. Diskless terminals were able to boot in just seconds from



a main server. We hope to be bringing you a feature on this emerging technology very soon.

Also soaking up the atmosphere in the .org pavilion were the Free Standards Group, the LinAXE people (who are planning an RTOS version of Linux for robotic applications), the Perl Monks, the NetBSD Foundation, the Linux Professional Institute, various LUGs, and the Electronic Frontier Foundation, recruiting new membership and explaining their cause.

HARDWARE

Given the difficulty many Linux users have had in the past getting various bits of kit to work properly on their OS of choice, it was interesting that quite a few hardware vendors were exhibiting at the show. Does this mean that these companies are finally going to give Linux users and developers the support they deserve? Do they actually feel that the Linux world offers enough of a financial incentive to do so? Apparently some of them do, and to be fair, some have been quietly supporting Linux for a long while.

Adaptec for example, have supported developers on their RAID and SCSI products for some time, but now they are more keen than ever on open source development. They were primarily at the show to announce a new open source program, and a new website (linux.adaptec.com) where visitors will be able to access latest drivers and utilities and chat with fellow developers.

3com also had a presence at the show, and were keen to show their eagerness to work with the open

source community. 3Com devices have always been well supported under Linux, mainly due to the work of Donald Becker. But now the company are now supporting the efforts of the open source community to the extent where you can download Linux drivers from their website, and were keen to promote their networking technology.

It would be remiss not to mention ICP Vortex, best known for their RAID devices, who were also exhibiting, and who have made a massive contribution to the cause of having such devices supported at kernel level.

MONEY, MONEY MONEY

One of the ways in which Linux shows are changing is the increasingly corporate nature of them. It's no longer a bunch of hackers getting together to have fun (though that is permitted!), you'll also find serious people doing serious business. That's not to say this is a bad thing, indeed, more big companies investing in Linux development is obviously a good thing, but it's certainly a noticeable change.

One of the heavyweights keen to show its support in New York was IBM. In his keynote speech, Mike Lawrie, IBM's general manager for Europe, claimed they're committing \$300 million to the development of global Linux support services over the next three years. This is on top of the \$1 billion investment announced earlier this year. The show also saw the launch of a new multiprocessor server, the eServer x430. Although not running Linux, the server incorporates IBM's *Linux Application Environment* to allow x86 Linux applications to run on it

ALWAYS THE SUN

Unsurprisingly, Sun had a very large presence at the show. Keen to show off not only their Java related stuff, but also cool developments such as *OpenOffice*, which was featured on a recent *Linux Format* coverdisc and appears to be progressing very nicely. Their efforts weren't solely dedicated to Linux though, as they were keen to display *GNOME* working under Solaris. The newly Sun-acquired Cobalt systems were also at the show promoting their new range of beautiful-looking servers on a separate stand.


SHOW FAVOURITES

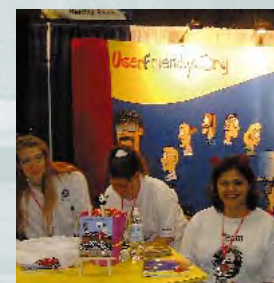
Finally, we should give a moment's glory to the products and companies that were picked out by a panel of judges as being the best of show.

Borland were very pleased to pick up the award for Best Developer Tool, which went to *Kylix*.

IBM grabbed the best hardware award for the eServer zSeries 900 and VA Linux scooped the Best Productivity Application award for *SourceForge onsite* – the custom version of the *SourceForge* development model, designed to run on intranets.

Develop Online, who provide hardware access to developers got the Best Embedded Linux award, and Caldera strolled off with the Best Network application award, which went to *Volusion* (see review this issue!).

Finally, as if one award wasn't enough, IBM got the overall Best of Show award for their *Small Business Suite for Linux*, which we'll be reviewing next issue. 



User Friendly.org were providing some light relief on the fringes of the hall.

Guido van Rossum

On his recent jaunt to New York, **Nick Veitch** caught up with Guido van Rossum, the creator of the Python programming language.

Linux Format: *While people may be familiar with the Python language, perhaps you could tell us a little about how you came to create it.*

Guido van Rossum: Well, in about 1990, I started creating Python. I was looking for a language that was much quicker to write in than something like C, but which was more like a programming language than the Bourne shell.

Previously I had worked on a language called ABC. I worked for a government funded research lab in Amsterdam, the CWI (Centre for Mathematics and Computer Science). I got to know a lot about language design as well as language implementation through that job. Later when I was working on different things, I realised there was a whole class of applications where doing the development in C++ or C wasn't an effective use of time. These were simple backup utilities, sysadmin tools – maybe even things I would only run once just to test something.

I love the shell when it's a ten line script, but when you get to thousands of lines it becomes unreadable and really unmaintainable. I wanted something that still had the interactive feel of the shell, but which you could use to write a proper program, with data structures, lists and so on.

There weren't a lot of alternatives at the time. Tcl and Perl began about the same time. I had heard of Perl, but it only ran on Unix systems then, and a quick look at the source made it clear that it wasn't going to be easily portable. One thing I wanted was something that was extensible. Had I known of Tcl, maybe Python would never have been created, or at least it may have influenced Python in different ways. In the end I had mostly positive influences from other languages. I realised that object orientation was the perfect solution to my desire to make the language extensible.

LXF: *Did you get much feedback?*



GvR: That was what kept me going. At first I just released it within the institute. There were a number of accomplished hackers there who loved it, which encouraged me to make a full release. In February 1991 I put all the source in a tar file, uuencoded it in 20 pieces and posted it to a usenet group. The response was amazing. I started receiving lots of comments, patches, bug fixes and wish-lists right away.

LXF: *Don't you find that unusual? You sort of expect that with an application that people can just go off and use, but a language requires more investment in terms of time from the people who are using it.*

GvR: You would think so. I think the initial users were people with a specific interest in languages. But Python is very easy to learn, and there were already quite a few applications for it, as we had been using it internally for a year. It came, in a sense, with batteries included – a large library of useful stuff.

The other thing is that at that time, a lot of people were looking for a language like Python, so it was also a case of being in the right place at the right time.

LXF: *If we can talk about ease of use for a moment, that's something that definitely comes across with Python compared to a language such as Perl which is easy when you understand it, but is a little daunting initially.*

GvR: Perl probably has a steeper learning curve, and it encourages the kind of tinkering that leads to complex and unmaintainable programs. The culture of the "one-liner" is very strong in Perl, and almost completely absent in Python. You can do the same thing in two lines, and when you look at them two weeks or even two years later, they will still be easy to understand.

LXF: *Is readability something that's very important to you?*

GvR: It's something that sometimes when I might get a bit overenthusiastic about adding new features, the users remind me that what they like about Python is that it's a small language, there aren't too many constructs that need to be learned either to use it, or understand other people's code. That's something which was probably inherited from ABC which was designed primarily to be an educational language.

LXF: *That seems to be part of the philosophy as well, that everybody can have a go with Python.*

GvR: You may be referring to Computer Programming for everybody, which was a big initiative about a year and a half ago. I still think that Python will make some inroads there, though I'm not actively involved with it myself, mainly because of a lack of funding for the project. Other people have taken it up though. High schools are taking up Python and some colleges. Some find that it is very effective to teach Python first, and then Java. They can concentrate on learning the concepts – algorithms, variables, code structure – and they don't have to worry so much about getting the code to compile correctly.

LXF: *What goals do you have for Python then, moving forwards?*

GvR: I don't have that many personal goals. I think

"wow this is just happening, I'm in the middle of a crowd of people who are very excited about this stuff, let's see if we can give them what they want". At the same time I think that Python is very well positioned to be the successor to Perl. It works very well with Java, we have the Java-Python bridge called Jython. The language can always be improved; we can keep polishing the diamond. We now have Unicode and XML support, and we'll see more and more large applications written in Python.

According to Tim O'Reilly, there are half a million Python users in the world. I don't know how we would verify that, but he sells books and he knows how many books he sells.

LXF: *In many ways Python and Perl are competitors – do you think there is a place for both?*

GvR: Larry Wall is a good friend of mine. He has a different philosophy about what makes a useable language and to be honest the jury is still out. He had the advantage early on, when Perl was the scripting language of choice for web applications, but that is changing now. Digital Creations, my new employer, has *Zope* which is a content management system as well as an application server, and all of that is written in Python. It is extensible through Python and all the system code is written in the language. So Python is useable to write large systems, more so than Perl. You can write such things in Perl, but the maintenance of the software takes over from developing it.

Python is more manageable for large projects. The way that it works tends to get people to write readable code, so less of the idiosyncrasies of the individual hacker come through. Perhaps the languages just attract a different type of person. Perl possibly attracts people who have that hackers pride, who get excited when they write a one-liner that nobody else thought could be done in one line, while the Python people are more excited when they create a piece of software and other people can understand it and make changes to it that work. It's more co-operative.

LXF: *It certainly seems that the more flamboyant hackers would tend towards Perl, and believe that their work is more of an art form than something which should be primarily functional.*

GvR: There is nothing wrong with seeing code as an art form. Maybe eventually we'll figure out how to produce software in an industrial fashion where you can predict maybe how long it will take and how well it runs, but right now the most productive programmers have something of the artist in them. At the same time, if you can get a bunch of people like that to work together, it's much better. At the other end of the spectrum if you want to write a simple program that scans a log file or something,

Perl is a little faster, but Python is catching up here too. We have a much faster regular expression engine in 2.0, and in 2.1 we hope to have faster line input as well as more new language features.

LXF: *So, how are you finding your new job at Digital Creations?*

GvR: I love it. The funny thing is that Paul Everitt has tried to hire me about five times. The fifth time I was ready, and it was like coming home. Digital Creations has exactly the right corporate culture for Python and for me. They have been very good at supporting the Python team, and I'm having fun with *Zope* and learning about that too. *Zope* will become better because the Python link has been formed, and Python will become better because of Digital Creations support.

LXF: *It seems to be a common theme to a lot of open source projects now.*

GvR: It is a very classic open source story I would say. The difference may be that Digital Creations is a completely open source company. *Zope* is their only product, and that is open source, and I don't think they have ever regretted it.

“According to Tim O'Reilly, there are half a million Python users in the world.”

LXF: *It also seems that many of the top open source developers find their way to the US.*

GvR: Whether they are from Europe or the US, I think there will always be a trend for people who start out as for example, a student developing an open source package and gathering a crowd of followers. Eventually they need a job. If you have developed a good open source package, that is a very big plus point on your resumé. I think US companies are currently picking up on that more than in Europe. The Python community, though, is fairly evenly split. I just found out today that there is a Korean Python users meeting running, and 400 people have signed up already. Python is definitely finding its way around the world. There are people in Sweden, Finland, Germany, all over the place contributing to the project.

LXF: *Will you ever get bored of Python?*


GvR: Probably as soon as Python gets bored of me. When the "benevolent dictator for life" joke wears thin it may be time to go.

LXF: *In other projects you often find that the main developers find the initial stages exciting, but once*

something becomes established there isn't so much fun in it for them anymore.

GvR: The Python language is a framework and has so many applications, there is always more work to be done. It isn't like at some point you have developed all the options. I'm learning a lot about how Python is being used, and about how we can support those applications better. There are plenty of things to discover.

We are working on the 2.1 release, but we also have this mythical thing called Python 3000 in the back of our heads. It may never happen but it is to focus our energy on far out ideas for changes or improvements. Especially for things like when we discover a design bug – we can't just say we'll fix that, because it will change the language and affect all the code designed to run in it. There is a possibility that at some stage there may be a new version of Python that would be incompatible to previous versions to fix such things. For example, one divided by three currently returns zero. That's exactly what the typical C or Java programmer expects, but it isn't what a FORTRAN programmer, or someone who doesn't know programming expects. These people might expect it to return one third. Other stuff, we think about how we would design it to work in Python 3000, and then try to figure out how we could evolve the existing Python to work towards that.

For that reason we are including a warning framework in 2.1 so the language can issue warnings about outdated features. We currently have three different regular expression implementations that we carry around. One that had a design problem and one that is very close to the way Perl handles regular expressions – for which we imported foreign code which became hard to maintain and implement – for example when it ran out of memory it would just core dump, and we want Python to work nicely. We now have a third generation engine which was contributed by a very talented Swedish programmer, and it's much faster too. Now we want to issue warnings to people using the old modules. So there's always something to do... 

MORE INFO

www.python.org – main Python website, for latest releases, news, events listings and more
www.digicool.com – Digital Creations main website.

www.zope.org – for information on Zope .
www.vex.net/parnassus – Vaults of Parnassus, a huge python resources site.
www.python9.org – Ninth International Python Conference website.
www.python.org/~guido/ – Guido van Rossum's personal website.



Life is getting ever simpler for the Linux sysadmin. First we had packages like Linuxconf and Webmin, which make administering a single Linux box quick and easy. Now, we have Caldera's Volution, a package which promises to handle a network of a hundred boxes with equal ease. Want to roll out a software upgrade across all your machines in one go? No problem. Do you need CPU load stats for a group of your boxes? A cinch. Volution promises to be a life-saver for the over-worked administrator, so we put it to the test here.
Richard Drummond

REVIEWS

All the very latest software, hardware, games and books put to the ultimate test – the scrutiny of our **LINUX Format** reviews team!

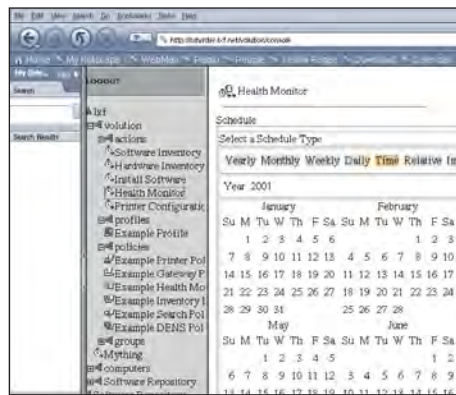
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Network administration made easy? **p22**

Caldera's admin and asset management package picked up a top award at the LinuxWorld Expo in New York. But is it really all it's cracked up to be?



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LINUX FORMAT



Our award for "TOP STUFF"

It's quite simple. If we really, really like something – I mean 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.

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Teamware Office comes to Linux for the first time, but can its promise of simplifying email, news and web communication in the workplace (whatever the platform) really be taken at face value?

SuSE LINUX 7.0 PPC

Could this be the beginning of the end of a wonderful relationship?

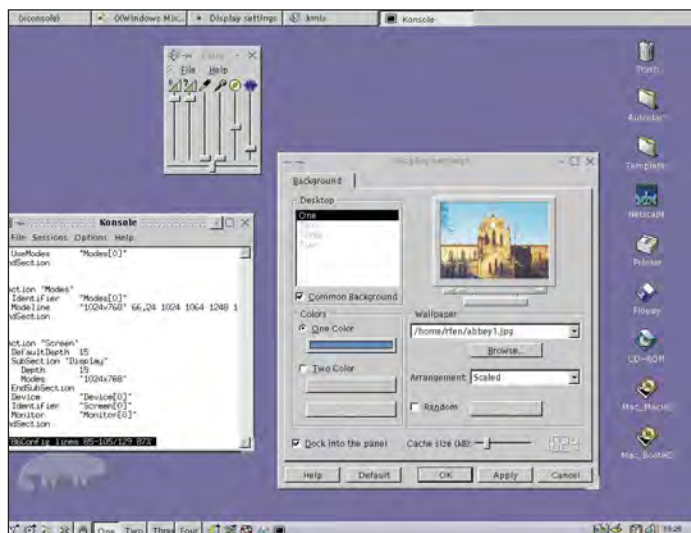
Rob Fenwick is forced to wonder...

Regular readers of *Linux Format* will know that the last time we attempted to install a PPC version of SuSE Linux, release 6.4, we were forced to resort to the use of a beige G3, as our glorious pink iMac simply turned up its nose in disgust at every attempt to install. Well, whatever the obstacle was in 6.4, it's evidently been removed in 7! Our revision B iMac can now boast a functioning Linux distribution. But alas, it still took a bit of work.

This time it was the X server. I'm really beginning to take a strong dislike to SuSE's SaX application, which in over 30 installations on ten different computers using two different types of processor and goodness knows how many graphics cards, has never successfully set up

my X server. RedHat's *xconfig* tool has never had a problem, Caldera's *lisa* sailed on happily and Mandrake's *drake* tools have done the job with no problem – SaX, on the other hand, when faced with the simple task of setting up my card with 1024x768 resolution and 16 bit colour depth looks at me as if I've gone insane, and promptly does everything in its power to put an end to my monitor.

After much angry screaming and shouting at my poor iMac, manually setting a colour depth of 15 bit (yes, 15!) in the Xconfig file brought X to life. This is worrying, as there is nothing particularly out of the ordinary about our iMac, and I know for certain that SuSE have a number of iMacs involved in their PPC



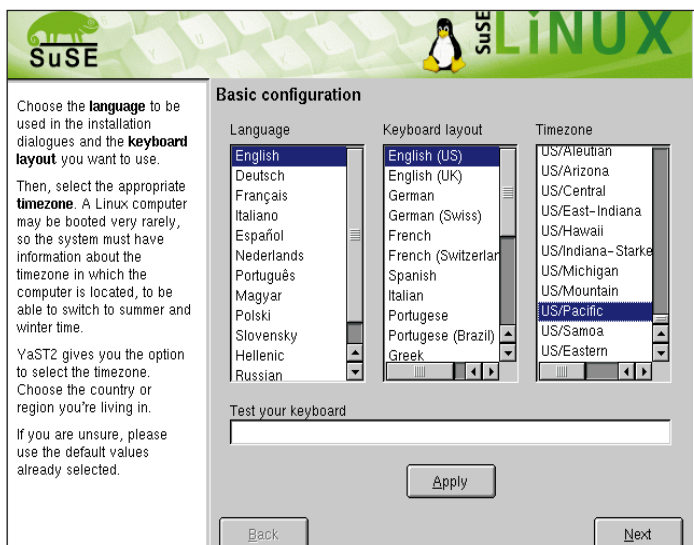
KDE2 would have been a bonus. And a more up-to-date kernel.

development process. Across the whole PPC range of computers, encompassing largely the Mac and Amiga, there are only going to be at the most 100 graphics adaptors in use, and by far and away the most common will be the ATI adaptors in Apple Macs – for SaX not to work first time, every time, on an iMac is extremely worrying.

SETTING OUR GRIPES ASIDE, THEN

Installation is handled by *YaST2* which is an excellent setup tool in every area except partitioning – I've been amazed that Mandrake's *diskdrake*

hasn't been snapped up as part of the installation process of every distribution, as it really is a humdinger. When installing, I selected 'Default installation, with office', but was surprised to see that none of the major office applications such as *WordPerfect Office 2000*, *StarOffice* or *Abiword* were included. In fact, the only possible thing I could see that might count as Office software is *emacs*. And as excellent as *emacs* is, it's not the first thing that a typical Macintosh user, for example, is going to think of when they think "Office". I also noticed that the distribution is based on kernel 2.2.16. This must have been out of date when SuSE were building this distribution, let



The basic configuration remains the same as before, it also replicates the X configuration problems that have dogged previous releases.

alone when it actually hit the shelves. SuSE have worked wonders with the USB support under 2.2.16, but nonetheless, I would still want to upgrade it to at least 2.2.18 immediately after opening the box. I was also upset to discover that when plugging a pair of headphones in to the iMac, SuSE Linux doesn't switch off the built-in speakers. Then to rub salt in the wound a bit, *kmixer's* attempts to shut the speakers off manually resulted in the levels staying resolutely stuck where they were. Upon using *XqMixer* instead, the speaker balance was determined to shove itself fully over to the left channel on every action! Quite a bit of work to be done on the iMac audio system, I think.

Sadly, the problems didn't end there – I couldn't find anything in SuSE's support database to explain why, even after twiddling with *xvidtune*, there was half a centimetre of screen 'missing' from the left hand side of the iMac monitor, so that when working in X (or indeed the console) the edges of windows, or the starts of lines were missing. If you're working on a file in *vi* in the console (I did a lot of this when trying to get X working) it's extremely frustrating to have the first two letters of every line missing. It would also be useful if *YaST2* defaulted to a setup that would allow me to emulate the presence of a second button, as most Mac mice have only the one.

After that torrent of near-abuse, I'm pleased to report that the distribution does have some working software, thank heavens. *Netscape* works as well as you would expect – but it's version 4.7, not 6 (of course, some would say that's no bad thing). And all of the *KDE* tools are included, so those familiar with Linux will have somewhere to start.

We can only hope this release is a 'blip' and that 7.1 is fares better

The manual is a pretty hefty 450 page volume, which is reassuring. It is well laid out, and covers the hardest part of installing Linux on a Mac (getting it to boot) in great detail. Sadly, it doesn't warn you that you will need to know which partitions you installed to in order to get the boot manager working, so make sure you take a note during partitioning. You get 60 days of installation support which includes a UK telephone number, but is only open on Mondays and Thursdays between noon and 5pm. However, email support is processed every day.

EXPANDING THE SYSTEM

I needed to expand the core tools provided with the distribution, and so downloaded simple tools such as *kICQ* and *kTicker* as source from the

'net, and compiled them into *KDE* with no problem at all. I then turned my sights to our USB Hewlett Packard Deskjet, using *YaST2*. The system detected that there was a USB printer 'Unknown by Unknown' chained off the USB hub, and when I walked through the setup procedure to force manual identification of the printer, I was delighted to see that there were no problems printing.

Apache comes installed as part of the default setup, and performs well on older Macs as well as the newer translucent variations, so if you've got an old Ethernet compatible Mac hanging about looking for a purpose, then a basic web server may well be the answer. Also on the server side, the *SuSEfirewall* daemon is supplied along with *NFS server* and *sendmail*. As no configuration tools are supplied for any of these, I was pleased to see that some thought had gone in to locking down the system, and disabling the daemons by default.

Unfortunately, no-one thought to disable the telnet or FTP daemons under the default installation, so anyone going on-line without first locking down these services are leaving themselves wide open to system intrusions. The process of disabling the entire inetd which both FTP and telnet spawn off is documented both in the manual and in the HTML help.

We're dual booting Linux with MacOS 9.0, and when I tried to access the Mac partitions through the icons thoughtfully provided on the *KDE* desktop, saw a file saying *where_have_all_my_files_gone?* This file explains why, if you have MacOS 8, SuSE cannot read your Mac partitions (it seems the 2.2.16 kernel can't handle the Mac OS Extended Format file system) unfortunately, it didn't tell me why this problem would affect me as a MacOS 9 user – I formatted this Mac before installing OS 9, and so didn't even upgrade from OS 8, which might have explained the presence of an Extended Format fs.

TALK TO ME

I've long been a fan of SuSE's cron setup which, after performing all of its tasks, mails the super user the output of the cron process, and if you are using the fax services, comprehensive details of all of the fax traffic through the system. It is innovative little touches such as this that are normally characteristic of SuSE's distributions, rather than the bugs.

The PPC version has fallen in to a release cycle that generally sees it hitting the shelves long after its Intel counterpart, and so with SuSE 7.1 for Intel now out there, I would hope that the gap between the Intel and PPC versions of 7.1 aren't too far apart, as I'm keen to see some of the distribution's core software upgraded and the bugs with the audio system repaired or, at the very least, prominently documented.

As usual with SuSE distributions, you get a little penguin badge which you can fiddle with while installing, and wear proudly or, at the very least, maim cuddly toys with.

I was sorry to see that 7.0 for the Power PC really is very buggy, as it falls far below the usual standard that I would expect from SuSE. I can only hope that this release is something of a 'blip' and that 7.1 fares better. To SuSE's credit, they contacted LXF after we reviewed 6.4 to ask us for full details of our boot problems so that they could work on them, and we'll be sure to forward them details of the problems encountered this time round, as SuSE is still the most promising of the PPC distros. Perhaps my honeymoon with SuSE is over, but let's hope not. I will be eagerly awaiting release 7.1 for PPC, in the hope that it will have put its many troubles behind. **LXF**

LINUX FORMAT Verdict

Ease of use:	4/10
Documentation:	9/10
Features:	4/10
Value:	4/10

A good PPC distro gone bad, let's hope the problems get sorted in the next release.

Rating 5/10

Caldera Volution

Nick Veitch hooks up to Caldera's networked answer to a host of IT management problems.

Price: from \$2995 **Publisher:** Caldera

Web: www.calderasystems.com/products/volution/

The problem: you have a large network of computers running Linux, and administration is a bit of a pain. Wouldn't it be nice if you could identify problem components, roll out an upgrade in one simple action, or just quickly take stock of how all your machines are doing, in terms of disk space maybe.

The solution, according to Caldera at least, is *Volution*. Set up a *Volution* server, and install clients on all the machines on your network, and you can keep tabs on all the hardware and software in your organisation, as well as automate some otherwise tedious admin tasks.

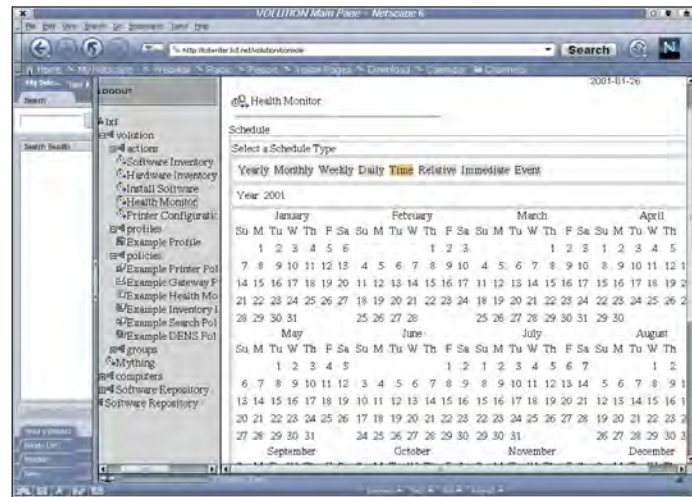
Volution is a combination of an LDAP server and some sophisticated Java/web tools and scripts which manage the client software across the network. At predetermined times, the server can order the clients to execute specific local scripts, and return the data to the LDAP database. The server can then display a web interface which enables you to see the results, and perhaps more importantly, search through them.

The interface itself is fairly flexible, in that it is essentially an LDIF format list of containers and objects. The objects (usually the computers attached to the network) register themselves on the system and can then be corralled into groups for easier maintenance.

The groups themselves, or the individual computers, are then linked to particular 'Actions' and/or 'Policies'. These objects are used to determine the way that the clients run the information gathering scripts, including scheduling and, depending on the script, various other parameters such as which specific conditions to check for.

INSTALLATION

The suggestion that *Volution* is a multi-platform environment as opposed to rivals like RedHat's *Network*, is fine as far as it goes. Unfortunately, that isn't very far at the moment. *Volution* will work, on the client side, on a number of Linux distributions, including Red Hat, SuSE, TurboLinux and Mandrake (though



The Health Monitor can warn you of overloaded machines.

other RPM/RedHat based distros should also work).

The server side of things is a bit more complicated. The web based administration pages want to be served from *Apache*, using the *Jserv* additions and the IBM JDK. Which is fine if you have those, but an inconvenience if the server is currently using a different JDK, or different version of *Apache* for some reason. Although it's possible to run it on some other distributions, your best bet is to install it on a Caldera *eServer* or *eDesktop* distribution, though even then you will have to install the preferred JDK and *Apache* server extension. More than anything else, this goes to show how it is often difficult to install any commercial software which tries to interface with open source components, and kind of makes the nice and easy to use graphical install for the actual *Volution* components a bit less useful than it might have been.

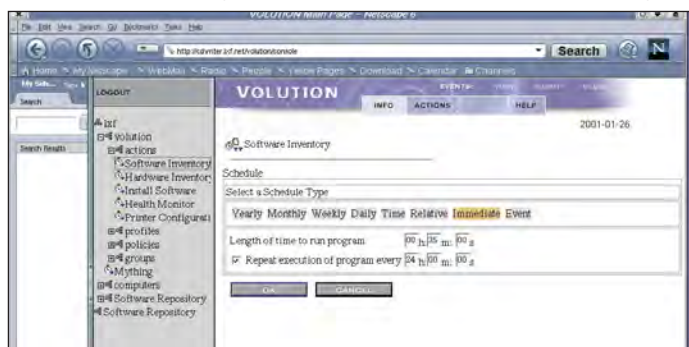
IN USE

Does *Volution* serve a purpose? It is certainly easier to sit with your feet up on the desk browsing a web

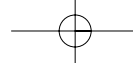
interface than scurry round hundreds or even thousands of different machines with a bit of paper and a screwdriver, trying to get a definitive list of your hardware inventory – though obviously you will have to scurry around and install the client software in the first place.

The ability to monitor CPU load and disk usage (amongst other things) and receive advanced warning of potential problems does offer a degree of usefulness to the overworked sysadmin not generally covered by other systems. While it is weak on dealing with specifics on individual machines, it is a broad solution for a range of network woes.

So where does this leave the sysadmin's favourite, *Webmin*? Well, in exactly the same place to be honest. *Volution* doesn't compete with *Webmin* on the minutiae of systems administration – you won't be able to reconfigure your Samba setup with *Volution* (though you can roll out standard printer settings, which is useful). In fact, *Volution* includes a link to *Webmin* through its web interface, if you happen to have *Webmin* running on a client machine.



Scripts can be linked to individual machines on the network, or groups.



Definite Linux

Advanced Bookshelf

Reams and reams of pertinent Linux documentation on a single shiny disc? **Biagio Lucini** finds himself in a bit of a time warp...

Price: £ 29.99 **Publisher:** Definite Software **Web:** www.definitesoftware.com

One of the most common problems for the Linux users is finding all the documentation that addresses various aspects of the operating system. In fact, there is a wealth of documentation freely available on the 'net, but there is a risk of getting lost among thousand of web sites and useless material dedicated to your specific area of interest.

This CD-ROM is intended to address this problem. It presents a wide selection of Linux reference works in searchable .pdf format. The publications on offer include material for beginners, administrators, advanced users and developers, but the latter two groups are best catered for. The only requirement to use the CD is a copy of the *Acrobat Reader* by Adobe, so the 'books' can be easily browsed on a Linux system as well as on a Windows or MacOS platforms. To save you the download,

Acrobat Reader for these operating systems is also included in the package. Even though installation shouldn't give you any problems and .pdf is a wonderful format for documents, I would rather have had a more 'portable' solution such as HTML. Anyway, format gripes aside, let's see what us available.

DEAD LINK

The starting file for navigating through the CD is 'start.pdf'. It's supposed to give access to the index page of the documentation with a single click. Unfortunately, this has not proved to be the case, at least under Linux which is case sensitive: the suggested click signals an error due to a capital letter that should be in lower case. Nothing dramatic, but this accident raises a suspicion that perhaps the browsing interface has not been thought out properly for Linux, and

this is quite disappointing. However, it is no real a problem locating the correct starting point. Fortunately, from here on, all links seemed to work.

MONEY FOR OLD ROPE?

The material is organised in logically structured sections that can be easily navigated thanks to a series of useful shortcuts. The box announces that this package is "Suitable for ALL Linux distributions", and apart from a few exceptions, no distribution-specific subjects are covered. So if you're looking for information or advice on how to install and configure Mandrake or Red Hat, for instance, you'll need to go elsewhere. Nevertheless, the selection of material is quite good with all the main areas of Linux development and use covered.

The sections presented are: Administration, Database (MySQL and PostgreSQL), File system structure, Howtos, GNU utilities, LILO, Samba, Programming (CVS, C, GNU Fortran, GNU Pascal, Perl, PHP and Python), Security (general guides and PAM) and X Windows (GTK 1.2, KDE 2.0, Wine, XFree 3.3.6). The ability to search for text strings or subject headings is very useful, and is something the .pdf format copes well with while retaining the original document's book-like structure.

The general idea of providing essential documentation to the advanced user in order to save time is good, and this is a fairly well put together product. However, some of the documentation is clearly out of

date (some examples are the Python documentation covering version 1.5 while the last version is 2.0 and there has been 1.6 in the middle, and XFree, for which version 3.3.6 is covered while 4.0.2 is not even mentioned), and most of the still relevant documentation will be obsolete quite soon, due to the fast pace of progress in many sectors of the Linux community. The merits of



The supposed starting page of the CD, check for bad links or you won't be going anywhere.

paying nearly £30 for a selection of freely available, and soon to be obsolete, documentation is something you'll have to discover yourself.

Just bare in mind that a bit of mouse-work on the Internet would probably serve up a better set of up-to-date manuals. **LX**

LINUX FORMAT Verdict

Ease of use:	6/10
Documentation:	4/10
Performance:	5/10
Value:	5/10

Useful material fairly well organised, but some documentation is outdated.

Rating 5/10

Definite Linux Advanced Bookshelf

Admin
Database
File Systems
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Admin

Linux Administration Made Easy

This documentation will attempt to summarize the installation and configuration, as well as the day-to-day administrative and maintenance procedures that should be followed to keep a Linux-based server or desktop system up and running. It is geared to an audience of both corporate as well as home users.

Linuxconf's technical references

A collection of documents presenting what Linuxconf does. Some tips for developers, General API for modules, the various API and objects used in Linuxconf, API of the GUI server, Module tutorial, Enhanced System V init script etc.

The Linux System Administrators' Guide

This manual describes the system administration aspects of using Linux. It is intended for people who know next to nothing about system administration (as in "what is it?"), but who have already mastered at least the basics of normal usage.

Maximum RPM

Taking the Red Hat Package Manager to the Limit. This is a book about the Red Hat Package Manager or, as it is known to it's friends, RPM.

The index of the documentation (on the left), together with some of documents available in the Administration section.

TeamWare OFFICE 5.3 for Linux

David Cartwright discovers another milestone on the road to Linux desktop utopia, with just one small problem...

Although Linux is clearly an excellent server operating system, its usefulness on the desktop has not as yet been universally accepted. Even those who would use nothing else at the server are still dubious about throwing away the Windows family on the desktop and moving to Linux.

Part of the logic behind this is the relative lack of applications – though with the simplicity of Unix/Linux GUIs such as XFree86 and applications like *StarOffice* it's

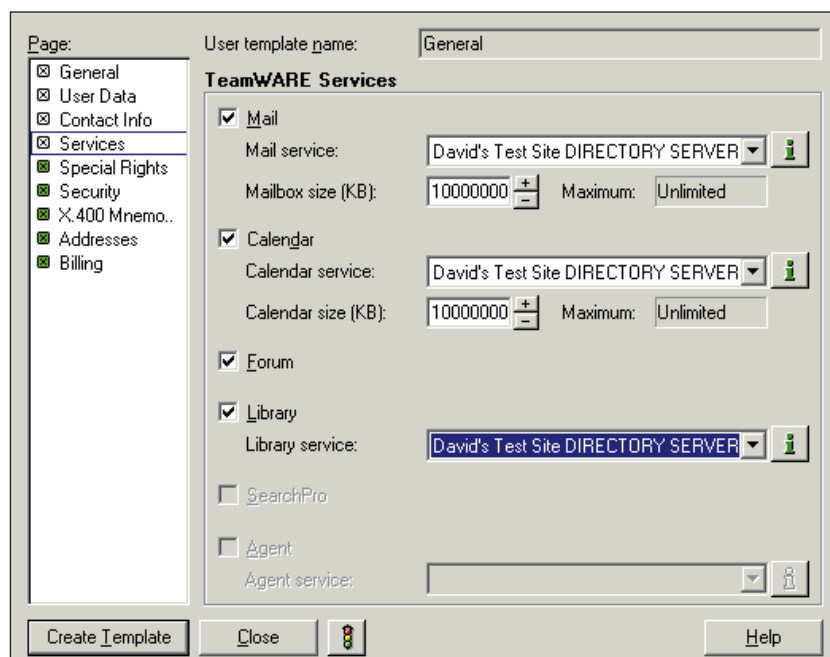
becoming more and more possible to replace the 'staple diet' Windows office applications with Linux equivalents, and to adopt a proper operating system on the desktop of even the least expert user. *TeamWare Office 5.3 for Linux*, a groupware system that provides functionality such as email, discussion boards and networked calendars, is another step toward the utopia of a fully Linux-based office.

At least, that's what you think

when you read the blurb. It's only when you stick the CD into the drive and try to install the Linux versions of the applications on your machine that you realise that what you're getting here is a Linux server to which the various programs in the TeamWare suite talk. The native client software is still restricted to Windows, and if you're going to use Linux as the client, the only way to really do it is to use the Web browser. Not that this doesn't give you a bunch of

functionality, of course, but it's a bit of a disappointment to discover that you're not getting a fully-fledged Linux version of something that used to be Windows-only.

Once the files are in the right place (they're placed in the /to directory by default – not particularly standard but immaterial on our single-partition test machine) you need to run the configuration program to actually set the various administrator-configurable parameters – the domain name for email, whether to turn on each of the services, and so on. To do this you log in as the TeamWare user (which is created for you by the installer) and run the *toconfig* program, which interrogates you for the various information it needs and makes the appropriate entries in the configuration files. Although you can have multiple servers in any TeamWare implementation, in our test we stuck with just a single-server installation. When the configuration process is done, a quick **tostart** launches the whole thing in the form

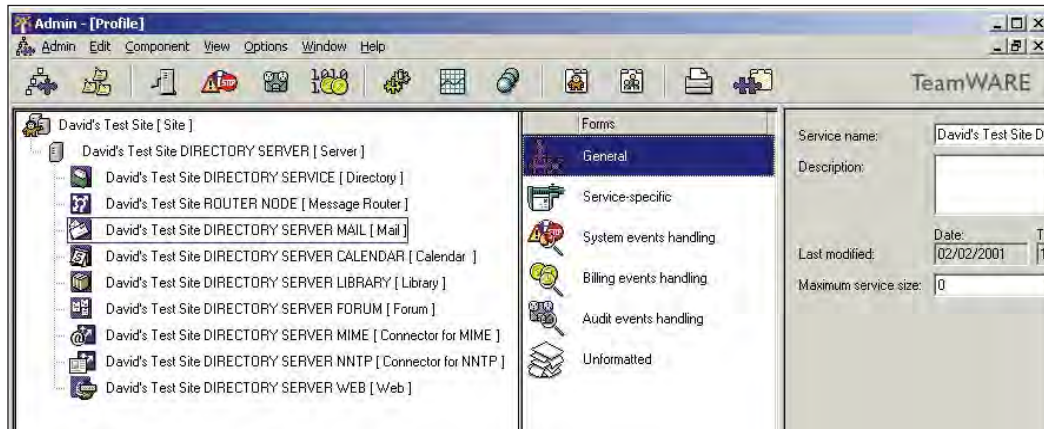


The Administration tool is comprehensive and easy-to-use. Unfortunately it doesn't seem to run on a Linux server.

functional, of course, but it's a bit of a disappointment to discover that you're not getting a fully-fledged Linux version of something that used to be Windows-only.

SETTING UP THE SERVER

Installing the package is pretty straightforward, and happens in two stages. You stick the CD in the server machine (in our case one of DNUK's cute little PIII-based rack-mount servers running Red Hat 6.2 – you can also go for Caldera, Turbo, SuSE, Red Flag



Yes, it's a Windows screenshot, but TeamWare's Linux support seems to be something of an afterthought and only extends to using a web browser as a client.

of a shedload of processes, each performing a specific function within the suite.

USING THE BEAST

Given that the installation process was so trivial, there had to be a catch, and there was – namely that to use the damned thing really needs a Windows machine, simply so you can run the admin tool. The admin documentation, despite being hundreds of pages long, is complete and utter rubbish, and the author would appear to have been paid based on the number of cross-references he could come up with. Everywhere you look you're told to refer to somewhere else, and there are precious few places where it actually tells you how to do something, the writer preferring instead to bounce you off to some other part of the manual. The clever bit is that the bits you're referred to sometimes doesn't even exist – there were places that said "See blahdy blahdy blah", yet despite typing the cited section name letter-perfect in the Find dialog, the section was nowhere to be found. It's actually quite a neat way to write a weighty tome without actually informing anyone of anything.

The main problem is that, to use the suite, you need to create some users, and as far as we could tell there's no simple way of doing this either from the command line. There is a bulk user import function, but this relies on you being able to build a complicated-looking configuration file,

and given the helpfulness quotient of the manual we ran out of patience trying to figure it out (a clone of the Unix **useradd** command would have been a nice touch, or maybe even a nice native X-based GUI application). If there is a way, Mr. TeamWare, then sorry, but we're damned if we could find it in the hour or so we spent hunting. And as mentioned before, the manual didn't give many clues. In the end we gave up and ran the Admin tool on a Windows 2000 laptop. This tool is actually pretty friendly and had us running with user templates (generic property sets that define users' basic rights and privileges) and users in no time.

PARTS OF THE SUITE

Once you've defined the users, you can actually use the system very successfully via a Web browser; in our case the version of Netscape that comes with Red Hat 7.0. The mail client is both POP/SMTP and IMAP4 compliant, and you can do the usual stuff like attaching documents to outgoing messages and annotating messages. The library (a document management and sharing system) provides a means of writing and modifying documents as a group without losing control over versions. The calendar allows you to schedule both private meetings and shared appointments (i.e. you can invite other people simply by picking them from the address book). The forum is a messageboard mechanism, for posting and replying to comments, and in addition to working on its own,

it can also incorporate Usenet newsgroups via the NNTP protocol. If you're using the Windows client applications there's also a notifier application and the previously mentioned Admin tool, but these aren't available if you're accessing the system via a web browser. All of the components are actually pretty usable, and thankfully you don't need to touch the manual to get to grips with the various features. The screen layouts are also clear comprehensible and usable.

BACK TO THE SERVER

Moving back to the Linux server software, though, the feature list gives away some worrying information – namely that in its first release, it doesn't yet support some of the features that its Windows sibling does (the SMS server, for instance, and neither virus checking nor LDAP is implemented yet). There are also some features, albeit admittedly minor ones such as X.400 mail, that the company has no plans to implement at all. On one hand it might be okay not to have every last feature implemented in a first attempt, but this is actually the third edition of the product, and there are actually some features (such as NNTP connectivity) that are labelled "behaviour guarantee not included".

SUMMARY

To be brutally honest, we have to wonder why TeamWare has bothered to do a Linux version of its package. While it's true that the components

PRICING AND CONTACTS

Product can be purchased on line from:
<http://www.teamware.com/linux>
 25-user licence: US\$350.
 100-user licence: US\$1,000.
 You can download a free 90-day evaluation version from the TeamWare Web site.

do indeed work perfectly well when you run them on Linux and talk to them via a Web browser, the admin interface is Windows-only and when you see far more ticks in the Windows column of the feature list than there are in the Linux column, you have to wonder why you'd do anything other than buying the Windows version and slapping it on an NT server. Perhaps the logic is that there's plenty of competition (specifically Exchange) in the NT world and that TeamWare wanted to move to a platform that it stood a better chance of dominating – but if this is the case, we'd have to say that you can only dominate a platform with a product if that product is usable and fully-featured, and in this case only if you write native client applications that are at least as good as their equivalents on other OSs.

To be fair, the main letdown of *TeamWare for Linux* is the admin side of things – even if you discount the lack of native client applications, the Web interface is at least functional and usable. But you really can't expect people to entertain the idea of a 400-odd-page manual that tells you diddly-squat and a user account creation mechanism that, as far as our extensive search would tell us, relies on you having a Windows machine to hand. Sorry guys, but we're not impressed. **LXF**

LINUX FORMAT Verdict

Ease of use: **5/10**
 Performance: **6/10**
 Features: **2/10**

A useable product, but the lack of native Linux support means it's something of a missed opportunity.

Rating 5/10

Wing IDE 1.0

LXF's own snake charmer, **Richard Drummond**, tackles this new Python Development kit...

Price: \$99 (Single license) **Web:** <http://archaeopteryx.com/>
Developer: Archaeopteryx Software

Think of a portable object oriented programming language. No, not Java, Python. Developers are beginning to discover that Python can take on many of the roles of Java. You can use it for server-side scripting in web applications and you can use it for creating portable GUI-driven applications. Add to that the fact that it can displace Perl for many of those quick scripts (without the arcane syntax) and that the Python interpreter can be embedded into applications to allow user customization through add-on scripts, and you have a very cool technology indeed. And because it is interpreted language with friendly grammar and a small size, it is language built for Rapid Application Development.

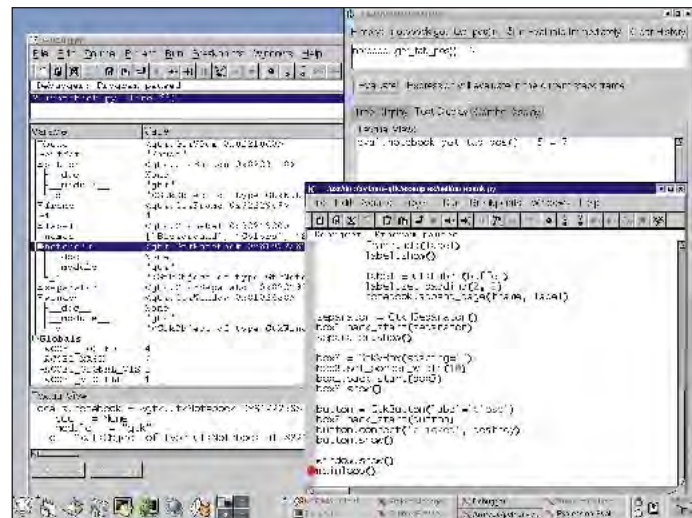
Wing IDE is the first in a batch of programming suites for Python development. Unlike its rivals, the open source *Boa Constructor* or The Kompany's *BlackAdder*, it is not a visual suite – it contains no point-and-click GUI builder – but the advantage it does have is that its flexible debugger allows the

debugging of remote Python scripts. You can test and trace the execution not only of Python scripts launched within the environment, but also scripts run remotely, whether as a CGI script or from a Python interpreter that has been embedded in a remote application. You can, of course, debug GUI-based apps too.

Wing IDE is available for download from the Archaeopteryx website and requires a valid license file to run. A free evaluation license may be requested from the site or you can buy a full license. Additionally, a free open source license can be obtained for free for non-commercial development. See the website for details.

THE TOOLS

Wing IDE is comprised of a project manager, editor, source browser and debugger. The multi-windowed interface is built using GTK. Although it looks less polished than *BlackAdder's* KDE GUI, for instance, it is impressively quick. If you are used to something like *JBuilder*, you'll be



The debugger lets you trace through a program and examine its state.

amazed at how responsive *Wing IDE* is. It is fully customizable, too, although this must be done by manually editing some text-based settings files.

The project manager is fairly basic, but allows the rapid creation of Python projects and presents a hierarchical view of the components in a project. It stores meta-information about a project in a simple text file. A neat touch is that it allows the creation of shared projects. In a shared project, it divides project settings into two files: a global one that can be checked into a CVS repository and a local one that just stores user-specific settings such as break points and window positions.

The editor is obviously a major part of any development suite and *Wing's* doesn't disappoint. It is fast, configurable and sports the usual syntax highlighting, auto-indentation, auto-completion, brace matching and so on. The editor comes with key-bindings to emulate a standard Windows text editor or *Emacs* or you can create your own editor

personality – so you should have no problems making yourself comfortable. The syntax highlighting supports not only Python source code, but just about every other source code or script format you have heard of, including C, C++, HTML and Makefiles.

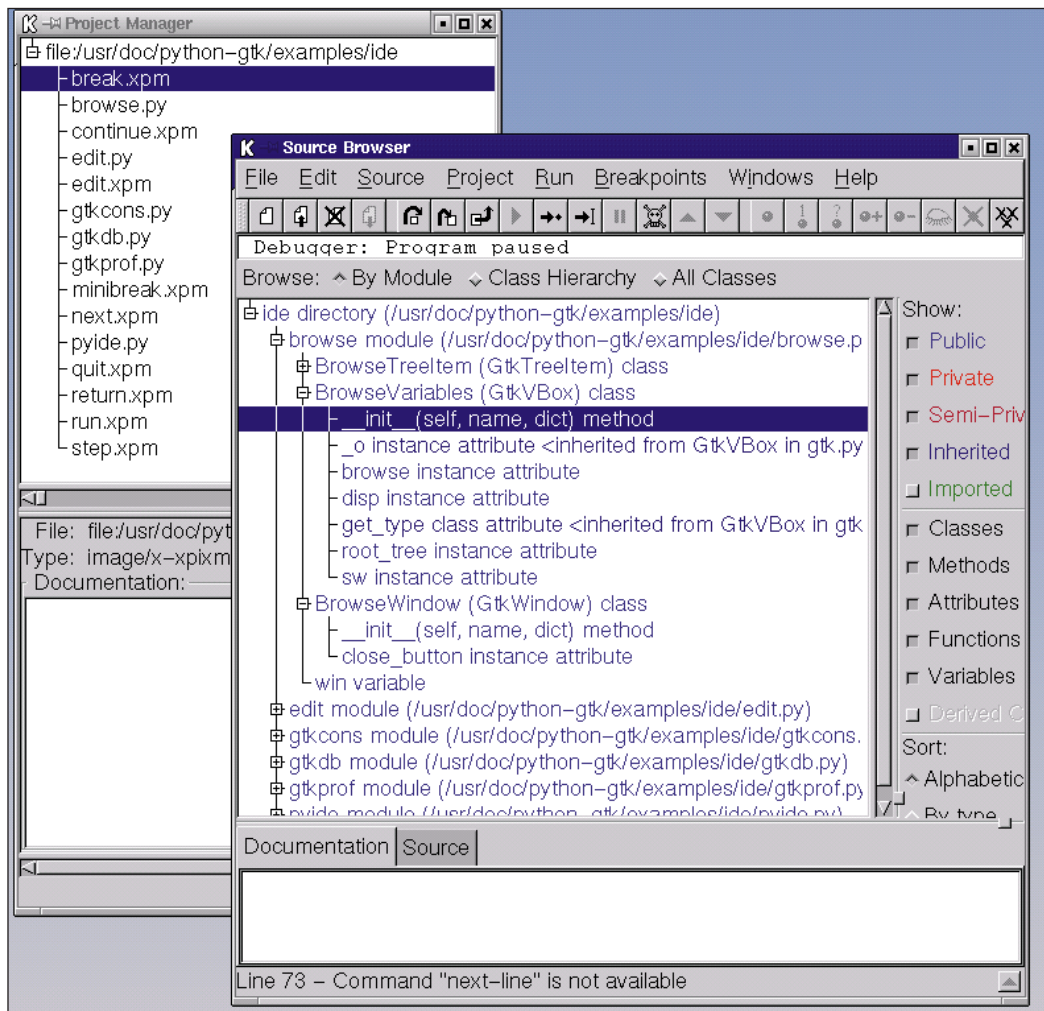
The source browser is one of the power tools in *Wing's* toolbox and is built on Archaeopteryx's powerful Python analyser. It exists in a separate window and presents a hierarchy of objects in your Python project – either listed by module or by inheritance – and can display the methods, attributes, functions, and global variables contained in a module. This is a great tool for navigating around your project; one click on object opens up the corresponding source file at the relevant point in the code.

THE DEBUGGER

Wing IDE's powerful debugger is probably its major selling point. It allows you to trace through the execution of a Python project and

OPEN OR SHUT CASE?

Wing IDE is not open source, although it uses a number of open source components. For example, the core of the suite is a powerful Python source-code analyser. This has been written in C for speed (the bulk of the suite is written in Python) and Archaeopteryx have released this as open source. The editor is based on Neil Hodgson's Scintilla Widget and the GUI is built with GTK – both open source, too. What's more, registered users of *Wing* get access to the source code of the proprietary components, too. You just cannot distribute any changes you make to it.



The source code browser analyzes your code and graphically displays its structure, making navigation easy.

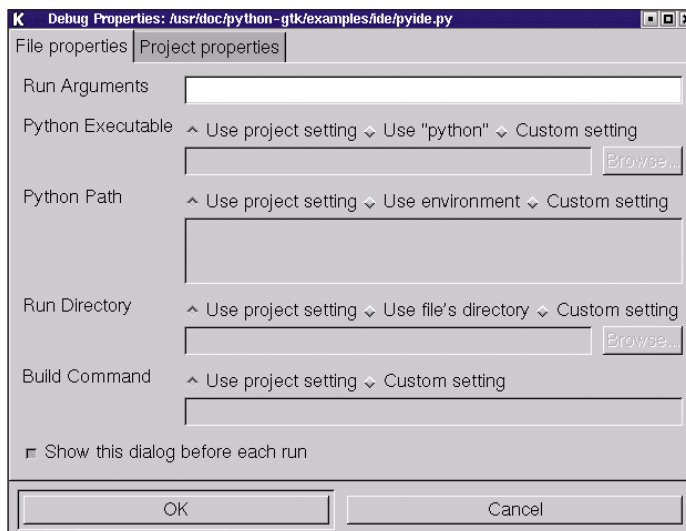
graphically inspect the stack and all local and global variables. The debugger supports the usual step-over, step-into and step-out functions to control the flow through your project, and also a run-to-cursor

function which will pause the execution at the point the cursor is positioned at in the current file. You can set break points, either normal, temporary or conditional breaks to pause your code at a specific point or

condition. All these tools make it easy for you to home in on areas of your code and examine what's going on.

Additional tools include a simple command shell and an expression evaluator which really let you interrogate faults in your code. Both of these may be used only during debugging since they rely on the stack of a paused Python process. The command shell lets you enter and execute Python statements interactively, and the expression evaluator, well, evaluates Python expressions and displays the result. Both tools feature a history.

The debugger provides excellent facilities for integrating with external projects. You can select which source file will be executed to start debugging or you can select an external program or script to be executed. The latter can be used to start a Makefile to build a project with an embedded Python interpreter, for



You can set run-time properties per file and for the project as a whole. This lets you tailor the environment your Python code runs in.

REQUIREMENTS

Wing IDE is available either as an RPM or as a tarball for x86-based Linux systems with a 2.2 series kernel and libc6. It supports Python 1.52 and 2.0 and requires the GTK and GDK libraries. A Windows version should be released soon.

example, and then debug any Python scripts that are called. Other debug options include selecting which Python interpreter will be used for execution and what the Python path and current directory will be.

As mentioned above, Wing IDE allows the debugging of remotely running Python scripts. This can mean remote as running outside of the IDE or indeed on another machine. Through the use of a special debug module included in your code, the running script can send debugging information over a network socket to the debugger for display. This can optionally be encrypted so is reasonably safe for debugging web-based applications deployed on a remote web site.

THE PACKAGE

Wing IDE is well put together suite of software. The editor is comfortable to use and the debugger is a powerful tool for developing fault-free Python applications. The ability to debug remote Python scripts is a particularly strong feature. My one main complaint would be a lack of documentation. Although, the 100-page PDF document covers the operation of Wing IDE well, the suite could use some context-sensitive help. For example, it is not obvious at first glance what some of the icons mean on the buttons. Some example projects to play around with wouldn't go amiss, either. **LXF**

LINUX FORMAT Verdict

Ease of Use	7/10
Features	7/10
Documentation	9/10

A solid suite of tools that will turbocharge your Python development. **Rating 8/10**

XFree86 4.0.2

Unhappy with the console? Look at Apple's anti-aliased font display with envy? Well, covet no more, as **Chris Jones** reveals the new face of Linux...

Web: <http://www.xfree86.org>

By default Linux displays information to the user by means of a simple text interface (on most distributions of Linux this can be seen by the scrolling messages when you boot/shutdown). For some this is ideal, but most computer users prefer a graphical interface to these 'consoles' and to achieve this on a UNIX-like operating system, it is common to use what is known as an X server. An X server is simply an application that is capable of drawing basic shapes (lines, squares, circles, etc.) and pictures into the memory of a graphics card. Graphical applications connect to this X server and send it instructions (e.g. *Netscape* will connect to the X server and send the right instructions for the X server to draw an image on screen that looks like a *Netscape* window). The X server that most Linux users will have is known as XFree86.

The year 2000 was a big year for XFree86, starting with the release of 4.0 in March and then 4.0.1 in July; both were considerable improvements over the previous releases. The year closed with the

release of 4.0.2, which was mostly a maintenance release, adding new drivers and some new features (see What's new... ? boxout for changes). 2001 is likely to be another good year as development continues.

If your graphics card is already supported and you don't need advanced features such as the Direct Rendering Infrastructure (DRI) 3D acceleration, you might be wondering if you should upgrade at all. In almost all cases the answer would be yes, if only because on top of the various features/updates, a whole raft of bug fixes have gone into this release which should make X faster and more reliable for everyone. However, unless you are an experienced user it is recommended that you obtain updates to X 4.0.2 from your distribution vendor (be it Red Hat, Mandrake, SuSE etc.), as compiling X from the source code is an extensive and laborious task.

SMOOOOTH!

One of the changes in 4.0.2 is that Keith Packard's Render extension has been included. While this extension may not seem particularly impressive or important at face value, it does provide a very important life-line for X. Being based on a very old protocol (X11 was designed in 1987), X is not well suited to the addition of new features because its protocol must remain backwards compatible for older applications. However, the architecture of most X servers



Anti-aliased fonts, seen here in a special version of KDE, make reading text on-screen a much more pleasant experience.

(XFree86 included) is such that special extensions can be provided by the server for clients (i.e. applications) that support them. The Render extension is currently still in its infancy, but already provides some very impressive features, most significantly anti-aliased fonts. Unfortunately support is still a little thin on the ground – beyond Keith's hacked up version of Qt/KDE, the only application which supports the Render extension at the time of writing is *xterm* (via the Xft truetype font rendering library), but very few

people use *xterm*, opting instead for *GNOME-terminal*, *Eterm* or *Konsole*. Fortunately, both of the major desktop projects, *KDE* and *GNOME*, have promised support for the extension in upcoming releases. Thanks to another of XFree86's server extensions, X Acceleration Architecture (XAA), it is possible to provide hardware acceleration for the Render extensions' other features, such as alpha-blended transparency. Again support for this is minimal so far, but it is the foundation for what promises to be an exciting period in

WHAT'S NEW IN 4.0.2?

ATI Radeon support, S3 Savage support, Number Nine support, numerous driver updates including S3, Neomagic, Chips and Technologies, 3DLabs. Updated DRI drivers for Matrox, Intel, 3dfx and ATI cards Render extension Support for Mac OS/X

XFree's history as the capabilities of this extension are improved.

The Render extension is currently quite hard to configure, requiring *FreeType2* to be installed, but as it develops this is one area that should improve, aided by the fact that *FreeType2* is likely to become more common on desktops because *Nautilus*, the new default file manager for *GNOME*, requires it.

GREAT FOR GAMERS

Although not new to version 4.0.2, the DRI and GLX extensions have both been improved for this release. When combined, these extensions offer very impressive support for high quality 3D rendering on the Linux desktop. This is crucial to the development of Linux as a mainstream OS because it allows the games market to expand as more cards become supported. As of 4.0.2, the list of supported cards covers almost all modern graphics cards, including the most recent offerings from Matrox, ATI, Intel and 3dfx. Notable by their absence from the list is nVidia who have been unable to provide specifications for their cards for legal reasons, however, they have produced their own driver (partially closed source) that offers very impressive 3D support and puts them clearly in the lead in terms of speed. As an example, the Mesa *gears* demo, a simple 3D application showing a number of rotating cogs,



Support for DRI is maturing with each X release, so you can spend even more of your time playing the excellent Tuxracer!

GLOSSARY (OR "WHAT THE HELL ARE YOU TALKING ABOUT?")

XFree86 – an open source implementation of the X11R6 protocol. Other implementations include Xi Graphics' AcceleratedX, MetroLink's Metro-X, eXceed (a Windows X server), Sun Microsystems' SunX, and many others.

Direct Rendering Infrastructure (DRI) – extension to XFree86 that allows applications to talk directly to the graphics card, e.g. to provide hardware accelerated 3D

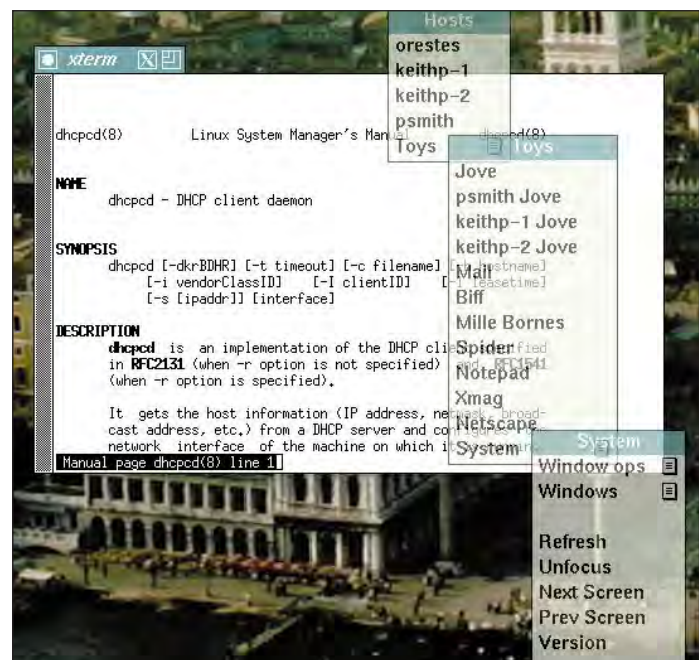
Anti-aliasing – A process that allows the edges of fonts (and other graphics) to be smoothed on screen for improved readability.

XAA – Many modern graphics cards can hardware accelerate 2D operations as well as 3D ones. This XFree extension allows this acceleration to be taken advantage of without modification to normal applications.

Mesa – A free implementation of the OpenGL API (it is not technically OpenGL because it hasn't received official certification from Silicon Graphics)

runs at approximately 500 frames per second on a Matrox G400 using DRI, but with a GeForce2 GTS using nVidia's closed source driver it runs at approximately 2000 frames per second. Only the ATI Radeon is a contender against the GeForce2, but since support for the Radeon is still very new benchmarks are not readily available yet. If the closed source nature of part of the nVidia driver doesn't bother you too much, it has definitely taken the crown from the G400 as the best graphics card for use with XFree86.

One area of XFree that hasn't improved much in this release is the configuration, and while there is work being done on a graphical configuration tool, it isn't anywhere near ready yet, so you will have to rely on vendor supplied tools or editing the configuration file manually. This is a shame and will probably hold some people back from trying this version. Upgrading to a very new



This is another part of the Render extension: true transparency support, as demonstrated by the menus here.

version of a Linux distribution, e.g. Red Hat 7, is a good path to getting XFree86 4 as it's included by default and updates to version 4.0.2 should be available.

Although X is a complex beast to install from the source tarballs, most distributions should have easy to install packages available by now, but you should expect a large download, plus the default package your vendor provides may not offer all of the extensions such as DRI. Again this is something that XFree should really be working on – perhaps by providing their own RPM and DEB packages that the distributions would merely need to modify slightly.

The future of X would seem to be assured, a number of companies are investing in improving its support for graphics cards (e.g. Precision

Insight, now part of VALinux), releasing code (e.g. MetroLink provided the core of the modular system v4 is based on, and SGI released the code to their GLX 3D system) and employing experienced hackers to work on it (e.g. SuSE, Mandrake and Red Hat) and as it gains more user-friendly and visually compelling features, its user-base is certain to expand. **LXF**

LINUX FORMAT Verdict

Ease of Use	6/10
Features	9/10
Documentation	5/10

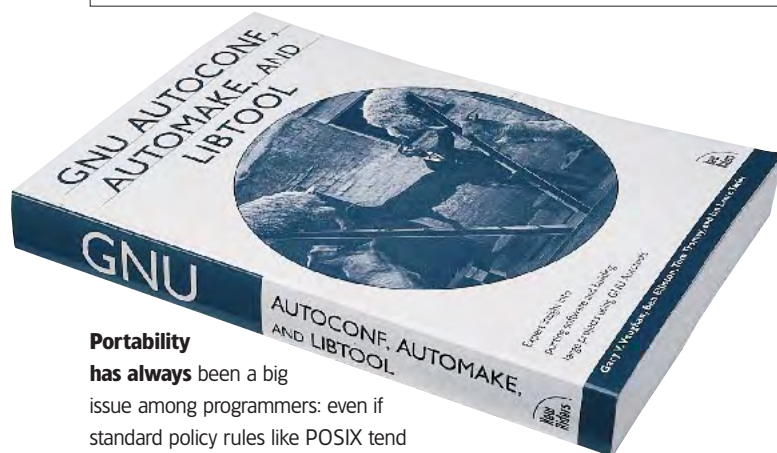
Since X is a vital part of a Linux machine for almost all users, this release is definitely a must.

Rating 8/10

GNU Autoconf, Automake & Libtool

Publisher: New Riders **ISBN:** 1-57870-190-2

Author: Vaughan, Elliston, Tromeo and Taylor **Price:** £30.99



Portability

has always been a big issue among programmers: even if standard policy rules like POSIX tend to give uniformity to the basic structure of the various Unices, experience shows how complicated it could be to port some applications written for one platform to another. The GNU Autotools are written by developers for developers in order to reduce portability problems. They have introduced the standard procedure – `./configure`, `make`, `make install` – that nowadays is the basis of the compilation and installation of most source packages distributed in `.tar.gz` format.

The authors of this book are some of the leading developers of the GNU Autotools. Therefore, in principle they have all the expertise needed to explain the secrets of these tools to users.

GNU Autoconf, *Automake*, and *Libtool* does not require any specific knowledge, but some basic C and shell programming know-how is desirable. The book is organised as a tutorial. The Autotools are firstly introduced at elementary level for the user, then some basic insights for the programmers are revealed. When the reader has gained a little confidence with these tools, the book explains how they can be put to practical use in a small project. This project grows

as you progress through the book, and is an excellent way to demonstrate new concepts.

The last section deals with portability problems, with useful advice about writing portable code in C, C++ and Bourne shell. Finally, you'll learn how to extend these tools, how to migrate existing packages to the Autotools and even how to write applications that can be easily ported to Windows! All the examples given are available for download, and this is a big help when comparing your results with those in the book.

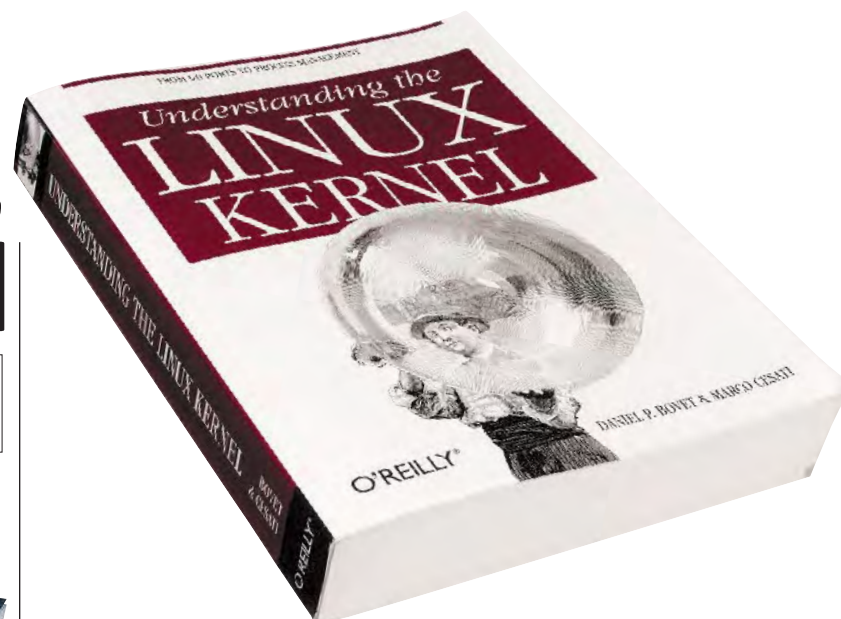
If you have lots of experience in this area, you may not get too much from this book, and you might be better off looking at one of the reference manuals available. But if you are just starting to write your own code and you would like to share it with the open source community, this book deserves a prominent space on your bookshelf.

Biagio Lucini

LINUX FORMAT Verdict

Well organised tutorial with plenty of useful examples.

Rating 8/10



Understanding the LINUX KERNEL

Publisher: O'Reilly **ISBN:** 0-596-00002-2

Author: Daniel P Bovet & Marco Cesati **Price:** £28.50

One reason for the success of Linux is the amount of information that's readily available. Because of its open source nature, if you want to really know how Linux works, you can go straight to the horse's mouth: the kernel source code itself. However, the kernel source isn't easily digestible by mere mortals, so that's where this book comes in. It dissects and studies the Linux kernel and explains its operation.

Understanding the Linux Kernel starts off at the lowest level, the CPU itself. It details how Linux uses the features of the x86 processor for memory paging, process switching and interrupts. It builds on this foundation, moving up through the kernel layers, describing memory management, interprocess communication, process scheduling, filesystems, disk caches and more. At each topic in the book, the important kernel data structures are highlighted, and excerpts of the kernel source itself are listed in the text – often rewritten slightly for clarity.

Of course, a book that seeks to cover something that is developed as

rapidly as the Linux kernel will always be in danger of becoming stale quickly. Though this was written before the release of the 2.4 kernel back in January – and so focuses on the 2.2 series kernel – the authors have extended the book's shelf life by including with each section a brief overview of the changes that were expected to be implemented in the final release of 2.4.

Understanding the Linux Kernel covers a difficult-to-grasp and technical subject matter, but it does so clearly and concisely. You may need to read certain sections several times before it finally clicks, but that is the nature of the material rather than the fault of the book. My only complaint is that it makes scant mention of other processor architectures than the x86 and that networking is not discussed at all.

Richard Drummond

LINUX FORMAT Verdict

A solid grounding in the operation of the Linux Kernel.

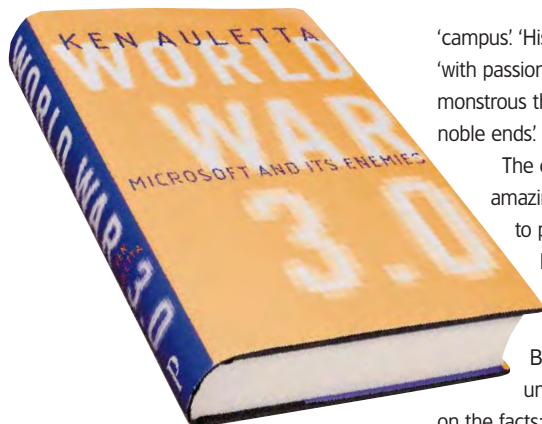
Rating 9/10

World War 3.0

MICROSOFT AND ITS ENEMIES

Publisher: Profile Books **ISBN:** 1-86197-390-X

Author: Ken Auletta **Price:** £17.99



Ken Auletta has written his Annals of Communication column for *The New Yorker* since 1992 and is widely regarded as one of the foremost commentators on the IT industry. In *World War 3.0*, he takes on the challenge of documenting the recent antitrust case against 'the great Satan' and examines the practices and attitudes that finally led the American government to take legal action against the world's second biggest corporation.

It's clear, however, that this is no cut and dried case regardless of your attitude to Bill Gates. Microsoft's 'hard-core' business attitudes, we discover, are not unusual in a corporate world where restrictive contracts and 'leverage' are merely tools to screw the opposition. What sets the Redmond giant apart – and what the entire trial hinged on – is that it was a monopoly in a position to abuse its power. Which it did.

Auletta paints a schizophrenic vision of the Microsoft. It was the consumer's champion, integrating IE into Windows to make Internet access more user-friendly. It was also the company that "was a bully, to allies as well as adversaries." His own feelings about the company are made clear during a trip to the their Washington

'campus'. 'History is replete,' he writes, 'with passionate idealists who did monstrous things in the name of noble ends.'

The court case is, literally, amazing with each side trying to portray themselves as helpless David facing Goliath. The government had David Boise – a showman with a unerring ability to 'zone in' on the facts; Microsoft had stumbling, dissembling Bill Gates and gigabytes of incriminating email. But could either prove that the actions of Microsoft – and specifically the bundling (or integration) of *Internet Explorer* into Windows – harmed or benefited users?

This is the product of extensive interviews with all the main protagonists, and so gives real insight into how each party thought the case would pan out as the most significant moments of the trial were revealed. This ability to relate the thoughts of individuals such as the judge, witnesses, prosecuting counsel and even Gates himself allows Auletta to give his book the depth of a brilliantly imagined courtroom drama. But this is real. The structure also gives the author a chance to add his own interpretation of events, which is crucial when dealing with such a complicated narrative. It's to Auletta's credit that what could have been a dry account buried in legal jargon is, in fact, as gripping as any contemporary blockbuster.

Andy Channelle

LINUX FORMAT Verdict

A surprisingly enjoyable read.

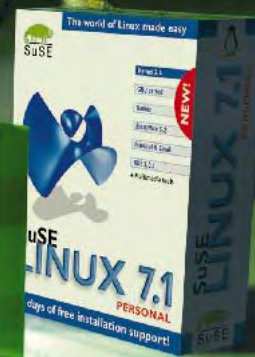
Rating 8/10

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GAMES ROUNDUP

Picture the scene. Another caffeine-demanding Monday morning. That disgustingly clingy drizzle outside shows no signs of stopping. The bus is slow, the train can't keep itself on the rails, and you're already 15 minutes late. And on arrival, you're blessed with a whole wonderful week of hard graft, agonisingly annoying colleagues, sanity-threatening stacks of work, and an overall belief that a solution must exist to this endlessly spiralling vortex of tedium.

What can you do? Assuming the position of a full-time hermit isn't likely to improve the situation – cave life isn't the most happening scene right now, and boredom will soon make a hasty return to your life with little remorse. The well-known line from that great film *The Shining* goes:

"All work and no play makes \$PERSON a dull boy", and with this in mind, the best way to relax after a lengthy day's toil is to sit down in front of your monitor with some top-notch computer games.

Game for anything

Traditionally, UNIX variants like Linux have been the haunt of techie types and those concerned with the

Would a few magnificent killer games be of greater benefit to the platform?

'serious' aspects of computing. As we've seen, though, Linux is making significant inroads into the desktop arena, and consequently game publishers have wasted little time in filling this growing hole in the market for entertainment software.

THE FOUR COMPONENTS OF FUN

A truly great game is built from a careful balance of the most essential ingredients. Developers must concentrate on every aspect to ensure maximum satisfaction and fun: an eye-candy extravaganza is pretty dull without any solid underlying structure, while even the most playable game can be reduced to a tedious chore if the graphical world has been incompetently realised. Four of the main elements are listed below.

- **VISUALS** – Are the characters and game environments appealing to look at and participate in? Of course, it's easy to go overboard and bombard the simplest of games with unnecessary frills. Take *Tetris*, for example, where clear and obvious graphics take preference over souped-up imagery.
- **SOUND** – Both the in-game music and sound effects should be clear, undistracting and suited to the task at hand. Ambient will hardly pump the adrenaline during an intense overtaking manoeuvre, while techno would be just a tad annoying in a puzzle game.

- **GAMEPLAY** – How does it actually feel? Key issues in this department include responsiveness (how fast the game keeps up with your actions), level design, and the behaviour of other characters and objects. Definitely the most crucial element to be considered.
- **LONGEVITY** – The game's lifespan. This isn't just a reflection on its difficulty level, though; cramming the game with hidden secrets and extra goodies provides plenty of replay-value after the end has been reached. *Mario World* for the SNES is a perfect example of how to provide a long-term challenge to players.

Casting aside the mantle of Serious Linux User, Mike Saunders gives himself RSI with a roundup of the latest – and possibly greatest selection of Linux games.



Check out <http://www.linuxgames.com> for all the latest gaming news.

However, it shouldn't be a race. The 'quantity vs. quality' argument still causes much debate. Do we want Linux to be deluged with masses of seen-before tripe, or would a few magnificent killer games from well co-ordinated coders be of greater benefit to the platform?

Nintendo's Shigeru Miyamoto – widely regarded as the consummate game designer, and the man behind *Mario*, *Zelda* and other notable classics – has proved that time is

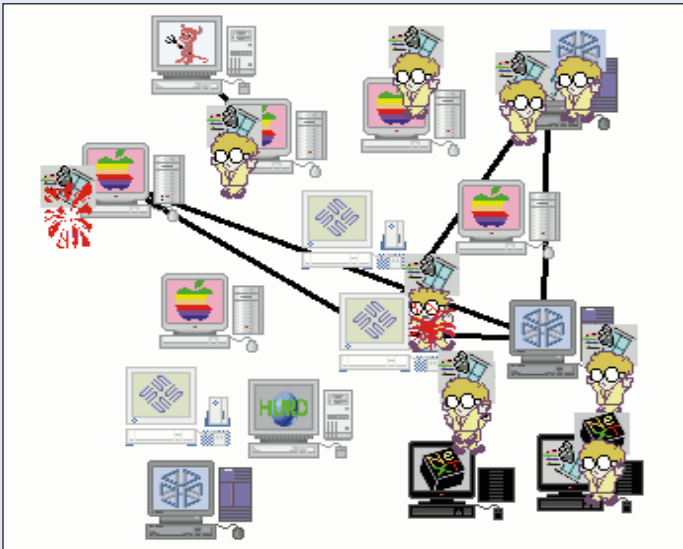
better spent on a few key games rather than thinning-out resources over a scattering of projects. Miyamoto and other designers have spent time defining and refining a variety of popular game genres, and the proof is in the swelling bags of dollars at the end.

So there is money to be made in games development, lots of it. But remember *Worms*? This is just one example of a first-class game that took the computer world by storm, yet was originally programmed by a single solitary bedroom hacker. We're not entirely dependent on the major publishers to make Linux a top choice for gamers – legions of free software coders around the globe have the talent and skills available to create home-grown games that could challenge the commercial players.

In this month's roundup, we're taking a hand-picked assortment of the best (and most interesting) free Linux games, giving them a thorough going-over, and rating them on the four categories listed in the box, left. So, joysticks (or mice) at the ready, let's have a butchers...

xBill

xBill 2.0 – <http://www.xbill.org>



One solution to Microsoft's monopoly that the DoJ didn't consider.

Catapulted to fame through his whoppingly-successful software company (and then shot back down again by the expert marksmen of the US DoJ), the man everyone loves to hate is, well, widely hated. Naturally, some bitterness is attributed to Gates' staggering wealth, but anyone who has suffered one too many BSODs in a day is bound to be a teensy bit miffed with the guy.

Only one solution remains. Download a copy of *xBill*, remember the nightmares you've suffered at the hands of That Software Company, and release all your pent-up frustrations with some mouse-bashing, endorphin-releasing, point-and-press annihilation fun, all at the expense of the man himself.

Many distributions have a copy of *xBill* lurking somewhere on the CD, but it's only a small download from the 'net. Once installed, you're ready to face the plot – yes, a suspiciously-familiar bloke by the name of 'Bill' has created a virus 'so powerful, it can transmute an ordinary computer into a toaster oven'.

Each and every system is vulnerable to this unpleasant disease,

so your job is to prevent Bill from installing his deadly OS – sorry, virus – onto any system he can find. Initially things are easy, with just a few machines running Linux, MacOS and OS/2 at risk, and a handful of Bills around that need squashing.

Don't get complacent, though; further on, the action grows horrendously frantic as hundreds of Bills toddle around infecting stacks of systems with their hideous programs. And watch out for the fires.

You can't expect endless nights of gameplay out of *xBill*, but it's a well-executed joke and those who find pleasure in squishing prominent software tycoons will enjoy a quick burst of satisfaction. Play it, and remember that it's not for real. Sadly.

LINUX FORMAT Verdict

Visuals: **4/10**
Sound: **None**
Gameplay: **4/10**
Longevity: **2/10**

The ultimate stress-relief tool for softco execs. And just about everyone else, for that matter.

Rating 3/10

BOB: Space Guy

BOB: Space Guy 1.3.0 –

<http://nak.ourstudents.md/software/games.html>

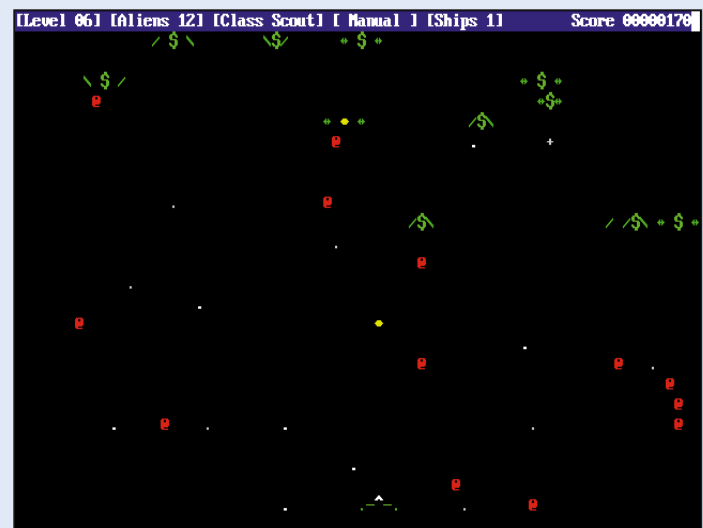
Gamers often view the text console as a poor-man's alternative to the real world of X-based entertainment and high-resolution zillion-colour action extravaganzas. Yep, there's certainly truth in the fact that X can deliver more in the way of flashy visuals, but with some clever coding a text-based program can still look pretty smart. See BitchX for a very good example.

Although the console is typically reserved for puzzle games and adventures, *BOB: Space Guy* (or *BobSG*) tries to bring an action-packed shoot-em-up to the world of ASCII. Package sizes are minute, and as it only relies on the ncurses screen

straight to the scrapheap. Fortunately, you're equipped with a rather spiffy gun yourself and can pick off the invaders using the space bar.

Once the intruders have been disposed of, you can move on to the next level. As time progresses, things get increasingly nasty and the number of aliens grows to eye-bleeding proportions. It's tough – clearly a good thing in terms of challenge – although the floaty control system makes direct hits somewhat more difficult.

Players running a console-only Linux installation will find *BobSG* amusing for the odd game, but it's all a bit repetitive.



drawing library (installed by default on most systems), you can get playing straight away.

Like other shooters, *BobSG* drops you into a scrolling starfield with hoards of aggressive aliens intent on removing your life as quickly as possible. You control your own ship through the J and L keys, and the thruster system used by the game adds momentum as you move about.

Linger too long, though, and the aliens' projectiles will send your ship

Rumour has it that dollar shaped aliens have colonised Neptune.

LINUX FORMAT Verdict

Visuals: **6/10**
Sound: **None**
Gameplay: **5/10**
Longevity: **3/10**

A simple text-based blaster, but nothing to write home about.

Rating 4/10

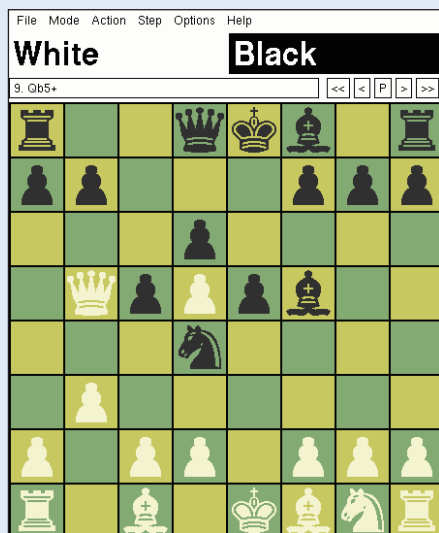
GNUchess Koules

GNUchess 4.0pl80 –
<http://www.gnu.org/software/chess/chess.html>

Sometimes, blasting brainless

beasts isn't the most appropriate way to wind down after a solid day's work. First-person shooters and racing sims are excellent diversions for a quick bit of relaxation, but a well-coded puzzle game is the perhaps best tool to eat away at the hours.

the amount of time you allow for the CPU player to think about 'his' moves. Our test chess novice found two seconds provided a good, solid challenge on this machine, while seasoned masters will prefer to give it more generous amounts of pondering time.



Yet another classic move from Mike. Everyone laugh as he loses his Queen.

Even though *GNUchess* will happily run as a standalone program at the text console, desktop users will prefer to use it in conjunction with *xboard*. This provides a graphical front-end for the chess engine on test here, along with *Crafty*, the Internet Chess Server (ICS), and email competitions through *cmail*.

Right from the start, it's clear that the *GNUchess* and *xboard* combo are no-nonsense tools for the serious player. You're presented with a simple layout (using a slightly garish yellow-and-green colour scheme), a set of buttons to cycle through the moves, and a time-remaining clock.

In terms of the game itself, *GNUchess* bases its difficulty levels on

Of course, two-player games are permitted too, and there's a full complement of saved-game features. *xboard* includes some extra options for tweaking the display, such as animated dragging, flashing moves and a flipped-view mode.

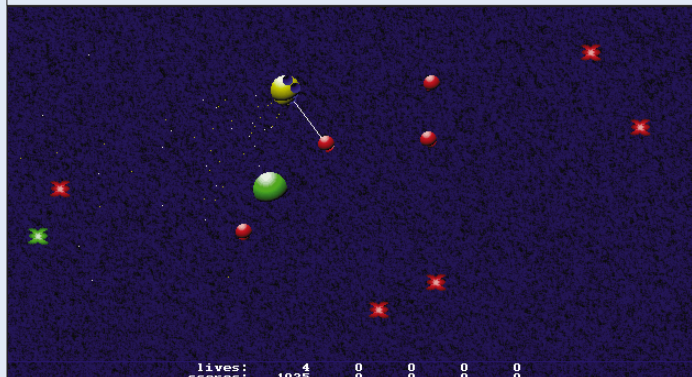
Up there with the advanced features is the hashfile option. With this enabled, your computer opponent stores positions and moves from previous games, and learns from its experience. Similarly, you can specify a 'book' file containing a sequence of opening moves.

So, *GNUchess* is clearly aimed at the experienced player, and includes none of the *BattleChess*-style frills that are often added to attract newcomers. With its impressive number of configuration options alongside the variety of display types supported (plain ASCII, curses, X etc.), it's a superb choice.

LINUX FORMAT Verdict

Visuals:	3/10
Sound:	None
Gameplay:	9/10
Longevity:	9/10

No fancy goodies for distraction – just solid chess.

Rating 9/10
Koules 1.1c – <http://www.paru.cas.cz/~hubicka/koules/English/koules.html>


Just when you've almost cleared everything up, a brand new problem pops out of thin air. Bit like life really.

Periodically, a game appears which completely defies categorisation. Such titles as *Parappa The Rapper* and *Wonder Project J2* surprised reviewers by rejecting the established genres and attempting something unique. So, say hello to *Koules*, a bizarre hybrid of action, puzzle and strategy elements that somehow hangs together.

RPM packages typically weigh-in at around 200k, and as it's a basic X-based game you won't encounter any major dependency problems. Both full-screen SVGAlib and X versions are available, and for sound support you'll need install the extra *koules-sound* package.

At first glance, *Koules* appears to resemble some sort of pseudo-hypnotic spheresploitation – the game world consists of a single black window with an increasing amount of balls appearing out of nowhere.

Confused? Essentially, you control a lone character whose job is to knock the offending balls (*Koules*) into the wall and destroy them. It's not that simple, though. For starters, the *Koules* don't simply sit around and wait for some action; instead, they have an steadfast goal to bash your character into the screen edge, causing instant life-removal. Now,

they're merely an annoyance, but the main course comes in the shape of the truly sadistic spheres, including the mammoth green blighters which send you flying.

Several stages later, things get increasingly hairy with magnetic spikes which leap out of nowhere, spit-dribbling balls that won't let you get away, and an ever-growing number of *Koules*. It's like some surreal nightmare.

Essentially, *Koules* is one of those love-or-hate games which attract both praise and damnation. It can be staggeringly addictive, and Hubicka (the main hacker) has produced a perfectly balanced control system and learning curve. There's little to say about the graphics or sound effects – they're functional and just do the job (although the *Star Wars*-esque level intros are neat).

LINUX FORMAT Verdict

Visuals:	5/10
Sound:	7/10
Gameplay:	9/10
Longevity:	7/10

LXF cannot be held responsible for any loss of sanity that results from extensive Koules sessions.

Rating 8/10

tuxKart

tuxKart 0.0.3 – <http://tuxkart.sourceforge.net>

Despite the great leaps made in processing power over the past few years, hyper-realistic racing games haven't won the battle against their cutesy counterparts. Even with the likes of *Gran Turismo* and *GP3* attracting envious amounts of attention, the comic-style driving genre provides a more suitable environment for wacky circuits, mad jumps and insane weapon scraps.

It's accepted that *Super Mario Kart* for the SNES kicked off a new generation of driving titles. Featuring superb control and course design (along with an inexhaustibly entertaining multiplayer mode), the plumber-based racer led to an assortment of clones and copycats – such as *Sonic R*, *Xtreme Racing* and the *Crash Bandicoot* variant.

So, as Linux has its very own cuddly mascot in the form of Tux the penguin, there's no surprise in finding that a fantasy driving romp has built up around it. *TuxKart* won't win awards for its unoriginal name, but it could prove essential in winning more converts over to the OS. At around 2Mb for pre-built binaries, it's one of the larger games on test here, and

you'll need an OpenGL library such as Mesa to get it up and running.

Hit the tarmac

Clearly, *TuxKart* has been heavily influenced by Nintendo's popular racer. The title screen's bright colour scheme and cheesy MOD musak (which severely grates after the first loop) all combine to supply that sickly-sweet image we're all familiar with. In this early stage of development, there's little in the way of options – just a lap selector (1 to 20) and a choice of four circuits.

Upon selecting 'Tux Tollway', the game's first track, you're thrown into a traditional-style tarmac course. It sticks to the spirit, though: generous lashings of greenery and the SourceForge billboards all contribute to the non-serious atmosphere.

Tollway doesn't hold much more in the way of scenery, although a few variations like chicanes and undulation add some interest.

Second on the list is "Geeko Peak" (can you see a pattern emerging here?). Owing much to the Choco Island courses on *Mario Kart*'s 64-bit incarnation, there's a good



Here we are on Geeko Peak, in last position. Pedal to the metal time!

deal of chasmic jumps, looming rockfaces and narrow bridges. Following that, 'Gowns Bow' is an unashamed Rainbow Road rip-off – sadly, you can't knock the other competitors into the void, but the transparency effects are stunning.

Saving the day is 'BSODs Battlements', which features ample opportunity to whack your fellow karters into the bubbling lava below. Based on Bowser-castle type tracks, it sports the usual collection of tunnels and boost strips, along with a nasty glitch in which the flying helper-penguin repeatedly chucks you back into the boiling ocean below.

Judgement day

In its current state (admittedly with much more development still to come), *TuxKart* is more of a novelty than a must-have game. Three major things still remain to be implemented: firstly, some decent background ditties for each level; secondly, a greater variety of courses; and finally, some sort of multiplayer mode. With these in place, *TuxKart* will jump to the status of recommended.

One other aspect that needs considerable work is the running speed. Right now, the coders recommend – at the minimum – a 450MHz processor. On our 800MHz test box, it's still a sluggish performer,

but thankfully you can resize the window for a smoother update. Additionally, the control system needs some tweaking to avoid the over-responsive turns that make the kart a wall-magnet, and the collision detection is slightly creaky in places.

If the developers keep on the right track, this will become a fantastic title

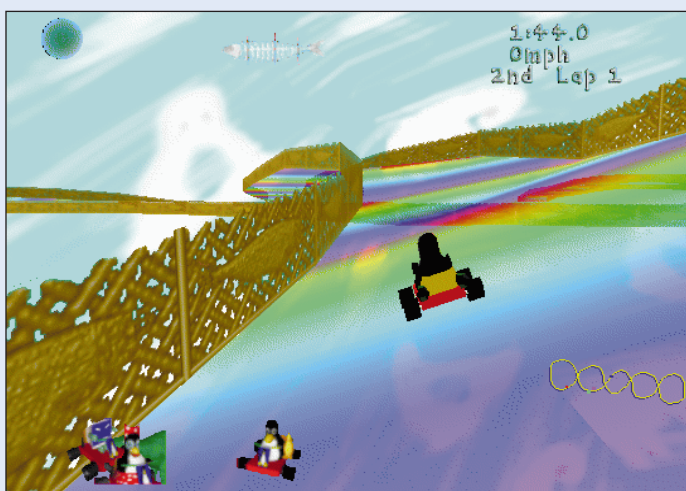
Niggles aside, *TuxKart* has an enormous amount of potential and its developers are fully aware of *Mario Kart*'s style and features that need emulating. By including the groundwork for a circuit editor (some familiarity with a 3D package is essential), superb longevity will be assured and the choice of keyboard or joystick control is a welcome inclusion. If the developers keep on the right track (no pun intended) and fine-tune the gameplay, *TuxKart* will become a fantastic driving title for users of all ages.

LINUX FORMAT Verdict

Visuals:	8/10
Sound:	1/10
Gameplay:	5/10
Longevity:	4/10

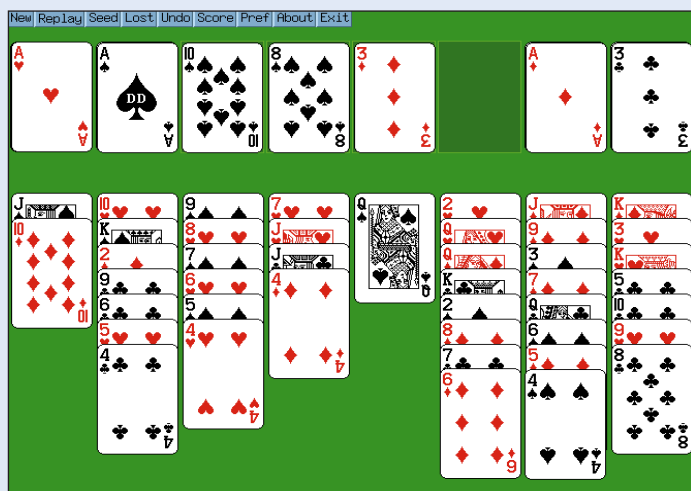
A promising racer with some nice touches, but don't expect solid weeks of play just yet.

Rating 6/10



Psychedelic antics at Gown's Bow – check out the smart transparency.

XFreecell

XFreecell 1.0.5b –
<http://www2.giganet.net/~nakayama/>


I could put that there. It's tricky. Ah, might as well restart. Again.

How many people here think *FreeCell* is the best reason for installing Windows? Maybe you're a *Minesweeper* fan, but whatever the case, Microsoft's card games always serve as a decent distraction from work. More importantly, a tiny window with some playing cards is less suspicious to your boss than a booming full-screen *Quake* clone.

Naturally, Linux has its own range of *Solitaire* and *FreeCell* games, and *XFreecell* is on test here.

As a plain Xlib-based game, *XFreecell* won't trouble you with any awkward dependencies and is straightforward to install. The pre-built binary includes a manual page, but if you're unfamiliar with the game you'll have to work out the playing system for yourself (which won't take long). Basically, *FreeCell* is a sorting challenge: you have to build up the suites along the top in Ace-to-King order, and there are four free slots to temporarily house hindering cards.

Playing *XFreecell* is much the same as with other popular implementations. There's no support for dragging, but the game uses double-clicks to throw cards into the

free spaces (and alters the pointer when a selected card has a valid move). The graphics can't be described as anything but functional, with monochrome images for the picture cards.

Players with experience of Microsoft's version will be happy to find that *XFreecell* can use the same seed numbers for generating games. As far as the other options go, there are options for toggling animations, individual moves can be undone and a score box shows how bad you are.

Some people can't live without a card game on their desktop, while others vomit at the thought of entertainment which doesn't involve heavy weaponry. Still, *XFreecell* is a small, fast and reliable standard.

LINUX FORMAT Verdict

Visuals: **3/10**
Sound: **None**
Gameplay: **8/10**
Longevity: **6/10**

A clean and simple FreeCell implementation, but action addicts should obviously look elsewhere!

Rating 7/10

Imoria

Imoria 4.85.19 –
http://members.nbci.com/_XMCM/kertes/index.htm

Standard console games tend to receive little coverage in this modern day of texture-mapped 3D worlds and ultra-fast processors. It's a shame, because many text-based games can work well – leaving everything to the user's imagination. Multi-user Dungeons and exploration adventures can provide many more hours of gameplay than a jazzed-up substance-lacking *Doom* clone.

Perhaps the most popular of all text games is the fantasy adventure, where you assume to role of a human/dwarf/wizard etc. and proceed to journey around the land, collecting objects and winning battles. *Imoria* is one such game, but your first battle may be installation. Make sure you have gdbm-devel if you're building from source, and you'll also have to

buildings and the like are easy enough to identify.

Each command key is listed in the help screen, and you can navigate the player around using the numeric keypad. Other characters move about too as you pop into the local shops (weaponsmith and so forth) and homes of other key plot-setting individuals. Initially, you can choose from five main quests, where your developing spell-casting skills can be put to good use.

Don't be put off by the simplistic front-end – beneath the texty exterior lies a complex adventure with all sorts to do. Admittedly, this type of game isn't everyone's cup of tea, but it's worth a look if you're a fan of this genre and have exhausted everything else on offer.

```
Gnome #####
Rogue #####
Apprentice #####
STR : 16 #####
INT : 14 #####
WIS : 11 #####
DEX : 15 #####
CON : 14 #####
CHR : 12 #####
LEV : 1 #####
EXP : 0 #####
MANA : 0/0 #####
HP : 13/13 #####
QST : 0 #####
AC : 0 #####
GOLD : 266 #####
WGHT : 342 #####
M_WT : 2166 #####
07:46 We 18th #####
```

edit the Makefile and change the default locations of its data files.

Everyone has their favourite choice of character, and you're offered an assortment to choose from when first started. From there, you can move on to choosing the age, weight and height, along with the "class" (such as Mage, Priest and Druid etc.). Once the character has been configured, you can enter the ASCII town – your character is represented by an "@", while

It's morning in the town, so you'd better grab some grub before embarking on the quest.

LINUX FORMAT Verdict

Visuals: **3/10**
Sound: **None**
Gameplay: **7/10**
Longevity: **6/10**

Nothing spectacular to look at, but still an engaging romp.

Rating 6/10

ClanBomber

ClanBomber 1.01 – <http://www.clanbomber.de/>

There's a nasty image around – often generated by the press – that playing games leads to social inadequacies (or, being a “nerd”). While this makes an entertaining story for other people who feel inadequate, there's not a lot of truth in it. Sure, spending eight hours perfecting your lap times may not win you friends, but there are worse things to do. After all, you could be listening to 5ive instead.

Really, what this view most commonly disregards is multiplayer games. In a way, they're a kind-of non-enforced team building exercise, much like those devised by company managers, but with a hint of fun. Multiplayer games are a top way to either strengthen friendships (if working co-operatively) or damage them for life (if that rocket launcher was pointing the wrong way).

Like most game genres, a few titles of note have appeared over the past few years which have taken multiplayer gaming to dizzying heights. *Micro Machines*, network *Quake* and *Bomberman* all won rave reviews at the time for the enjoyment

produced when a number of players get together. Now, thanks to the Free Software community, we have our very own Bomberman clone in the form of *ClanBomber*.

Knock and bomb

Keeping part of the ClanLib name, *ClanBomber* is built around that game-development library. As a consequence, you'll need it (along with some of its own dependencies) installed on your system before you can fire it up. Many recent distributions have ClanLib included, but it's not a major download.

At first sight, the thing which immediately strikes about *ClanBomber* is its polished appearance. A fade-in attractive logo accompanies some crystal-clear sounds during the introduction, before landing you in the menu screen. One of the game's best features is its ability to run under a wide variety of interfaces – there's SVGAlib, framebuffer and full-screen X versions.

Those who have never played *Bomberman* before will have little



Bombtastic shenanigans aplenty as the two Tuxen fight it out against BSD's mascot.

trouble getting acquainted with the game world. Like *Tetris* and *Tron*, it's one of those deceptively simple yet endlessly challenging games which take seconds to learn and years to master. In a nutshell: you control a character in a 2D over-head world view, placing bombs to blast away blocks and your enemies.

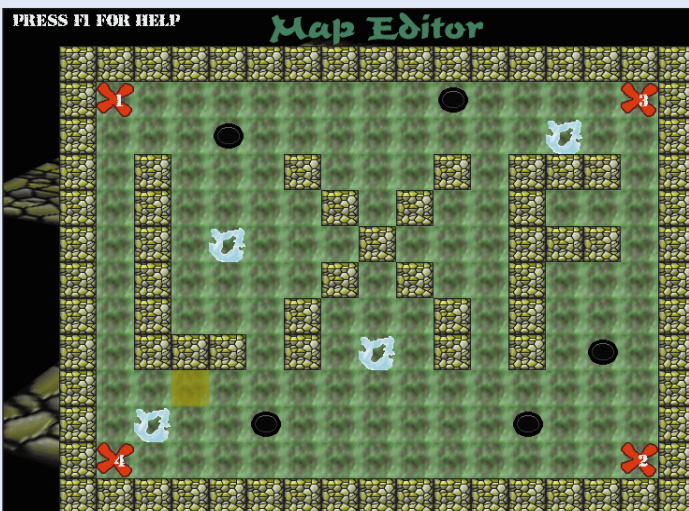
In true Linux tradition, you can play as Tux the Penguin. But, with a nod of the head to other free UNIX developers out there, you can also be the BSD Daemon and various other sinister creatures that seem to be popular in the community. You can also rename the characters and assign each one to a particular team, and there's a variety of keyboard layout options (shown in a mini photo on-screen).

Venting frustration with colleagues is possible as *ClanBomber* supports up to eight players on one system. While this can get cramped with several gamers crowded round a single keyboard, we gathered some victims in for testing and it worked reasonably well. More importantly, network play is planned to be included in future releases, so there'll be no excuse for working during office hours.

Block and blow

Essentially, *ClanBomber's* arenas are much as you'd expect, the game is ready-supplied with a healthy 32 of them. The usual bomb-improving and capacity-extending power-ups have been implemented, in addition to a skateboard and kick function. And, while the multiplayer mode naturally shines the brightest, *ClanBomber's* artificial intelligence (AI) has been fine-tuned and works competently.

Level-editors in games have traditionally been slack efforts providing little of the capability you would expect, but *ClanBomber's* coders should be roundly applauded with an easy and workable arena designer. Undoubtedly, this adds a huge amount of longevity to the game, and it's especially useful in the multiplayer challenges.



The level editor in action. You can set the character starting position and add ice patches etc.

LINUX FORMAT Verdict

Visuals:	9/10
Sound:	7/10
Gameplay:	9/10
Longevity:	10/10

Marvellous multiplayer mayhem with the added bonus of a level editor – give it a try.

Rating 9/10

ITetris

ITetris 1.6.3 –
<http://www.alphalink.com.au/~michg/ace/itetris/>

Clearly, no game roundup would be complete without some sort of *Tetris* clone thrown under the spotlight. This enormously popular and achingly addictive block-based puzzler featured as the flagship title for Nintendo's equally famous Game Boy handheld (with the original concept being devised by Alexey Pajitnov).

RSI, come to think of it, can probably be triggered in no better way. Virtually every computing platform that's ever been dreamt about has some variant of *Tetris* available, and Linux is no exception. *Intelligent Tetris* comes in SVGAlib and X flavours – therefore a classy choice for both the console and full-blown graphical desktops – and was first knocked-together for MS-DOS in 1993.

At ground level, *ITetris* resembles one of those old Amiga/ST public domain productions with bright, bold visuals and a scrolling marquee of intro text. Jump into the game itself, though, and you'll find a familiar control system and layout in addition to one of its coolest features – a music playlist. Instead of piling all sorts of sound format support into the code, *ITetris*'s hackers let you

specify individual music players and tracks for each level and screen in the game.

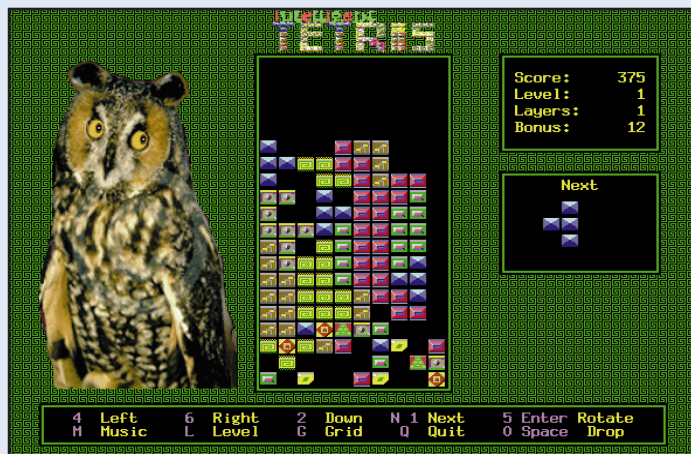
Zen-style mastery of the blocks – as old-time stackers will know – is crucial. When it comes to the crunch, *ITetris* provides all the usual next-piece boxes, alignment grids and smashing flashes when four lines are obliterated at once. (Oh, and there's some extras like an Owl whose beady eyes follow the falling blocks with eerie accuracy.)

Yet the fancy graphics don't distract from the job in hand, and *ITetris* manages to be a competent and fun puzzler with top-notch music-selection options. There's a decent choice of levels tucked in there, and it can even play itself from random positions in the demo mode!

LINUX FORMAT Verdict

Visuals: 6/10
 Sound: Your choice
 Gameplay: 8/10
 Longevity: 9/10

Like most other Tetris variants, it's obscenely addictive. Handle with care.

Rating 8/10


What a mess. I just need one of them long thin ones. Grrr.

XTamago

XTamago 1.0.0 –
<http://www.hotlemons.demon.co.uk/xtamago/index.htm>

Soft and cuddly pets are all well and good when they're behaving, but once they open their bowels all over your brand new carpet, you tend to lose sympathy with the belief that they're innocent little animals. You could buy a caged creature, but – as Violet the budgie often asserts – they can still reduce you to a gibbering wreck with their incessant noise-making.

Well, a few years back a solution appeared in the form of Tamagotchi. This pocket-sized handheld beep-factory attempted to bring the fun of a family pet to a monochrome digital screen, and the fad didn't last all that long. You fed, cured and played with the little cuddlebot until it morphed into some sort of grotesque freak, at which point it died.

Even though the main marketing device was portability, a number of PC-based virtual pets have popped up for those who need the hassles of animal maintenance intruding on their work. *XTamago* is an X-based lovable thing which includes the usual operations that featured in Bandai's toy. Except this time, it's a cat. Probably. It might be a dog, but it's hard to tell.

Everyone loves cats, don't they? Seeing as everyone over the age of 63 owns about 50 of them, it must be true. Your job is to keep your feline friend healthy, fed and

comfortable. Not an easy task, though. It'll persistently annoy you for more grub, affection and medication, and spout "dig my rap" (?) at the slightest provocation.

Tamagotchi-style games exist for almost every platform now, and *XTamago* doesn't excel in any notable area. It moans, you feed it, it moans, you inject it, it moans, and you kill the X server. Fans of the original toy may want to give it a try, but you'll probably find more satisfaction in keeping a gold fish.



"So what? You didn't bite Cupid into action, as I asked!" etc.

LINUX FORMAT Verdict

Visuals: 2/10
 Sound: None
 Gameplay: 2/10
 Longevity: 1/10

All the frills and spills of animal life preservation on your desktop. Find a spider in the kitchen instead.

Rating 2/10

Conclusion

So, after examining the games on test in this month's roundup, what can we say about Linux as a gaming platform? Could it overtake Windows as the OS of choice for entertainment software, or is it doomed to be simply a hacker's alternative forever? Questions like these are becoming ever more common as the platform receives more coverage in the press.

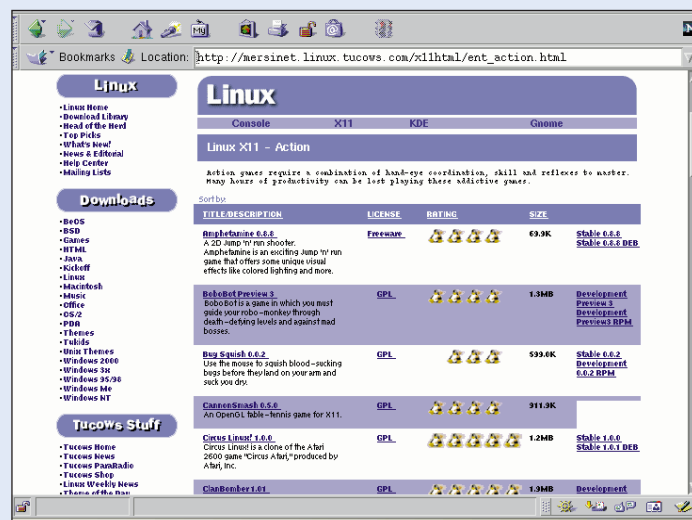
Looking at the huge progress Linux has made in the desktop world over the past few years, it would be unwise to dismiss it as a gaming platform. As the number of home-user desktop applications increases, so does the number of people wanting excellent games for some post-work relaxation. There's already enough demand to warrant Loki's superb work on porting many top Windows games, for example.

Even though Microsoft's OS attracts the most attention from coders, three reasons stand out for choosing Linux as a development and game-playing platform: firstly, it's free; secondly, it's fast; and lastly, it's stable.

While the price point may not be such a significant issue, the other two points indubitably are. It's no fun spending £1,000 on a neat bit of PC kit if Windows' crawling performance brings it crashing down to ZX81 levels. Moreover, reaching the final stage of an epic adventure and suddenly suffering a Blue Screen Of Death is equally distressing.

Real gamers take gaming seriously. They're not interested in reboots, registry hacking or performance tuning. They want hassle-free fun. Indeed, this is one of the reasons why consoles have proved to be so successful – they provide true plug-and-play, and Linux, with its outstanding performance and stability (together with constantly improving package management) could soon be in a great position to match this. Regular readers have already seen the first steps in this area with the Indrema games console (see issue 8).

Linux's flexibility as an open-source OS has given hardware manufacturers a powerful base for running the games of the future. Watch this space! **LXF**



Pop over to <http://linux.tucows.com> for comprehensive listings of downloadable Linux games.

FOR GOOD MEASURE

We've aimed to cover a broad spectrum of games in this month's roundup, but due to space constraints there's bound to be some other goodies that deserve a mention. Many other open-source gaming gems are being worked on as we speak, so if you've played to death all the games on test here and fancy a few more time-fillers, check these out:

- **XRacer** – Wipeout clone with slick visuals
<http://xracer.annexia.org/>
- **Aleph One** – First-person shooter (similar to Marathon 2)
<http://www.uni-mainz.de/~bauec002/A1Main.html>
- **Tux Racer** – Penguin racing through 3D courses
http://tuxracer.sourceforge.net/game_info.html
- **LinCity** – Be Mayor for the day
<http://www.floot.demon.co.uk/lincity.html>
- **Arianne** – Colossal online role-playing game
<http://www.arianne.cx/>

TABLE OF FEATURES

We tested the games on a 800MHz, 320Mb RAM Pentium III PC with a 16Mb ATI Rage 128 graphics card (running Linux-Mandrake 7.1). Note: the package sizes and memory statistics below should only be used as a rough guide. Memory usage varies from system to system, and is affected by the program's configuration and various other factors.

	xBill	BobSG	GNUchess	Koules	TuxKart	XFreeCell	Imoria	ClanBomber	ITetris	XTamago
License:	MIT	Distributable	GPL	GPL	GPL	Distributable	Public Domain	GPL	GPL	GPL
Interface:	X11	Text	Text/X11	SVGAlib/x11	X11	X11	Text	X11/FBdev/SV GAlib	SVGAlib/x11	X11
Dependencies:	None	ncurses	ncurses	SVGAlib	OpenGL (Mesa)	None	ncurses	ClanLib	SVGAlib	None
Package size:	45k	25k	560k	180k	2.1Mb	350k	430k	2.0Mb	230k	500k
Memory:	2Mb	723k	9Mb	1.1Mb	18Mb	0.6Mb	1.5Mb	21Mb	1.1Mb	2.1Mb
Recommended:	26	Colour terminal	16Mb RAM	50+MHz CPU	450+MHz CPU	Any X system	Any System	166+ MHz	60+ MHz	Any X system
Genre:	Click-em-up	Shooter	Puzzle	Ball control	Racing	Cards	Adventure	Bomberman clone	Puzzle	Animal welfare
Players:	1	1	1/2	1-5	1	1	1	1-8	1	1
Alternatives:	None	Gamma patrol	Crafty, PyChess	None	Tux Racer, XRacer	JSolitaire, GNOME/KDE	Rogue, NetHack	BomberMaze, XBlast	GtkTetColor, Teamtris	KTamaga

THE BEST NEW OPEN SOURCE SOFTWARE ON THE PLANET

HOT PICKS

Mike Saunders hits the Internet to dig up another eclectic selection of Open Source gems.

From the complexities of emulating another operating system to simply aping coloured pencils, the Open Source movement is constantly throwing up surprises. This month we're taking a look at another seven applications that deserve a home on your hard disk. Though many of these projects

aren't anywhere near completion, we've chosen them because they're either innovative, original or break the 'naming your mail client after wood' tradition. Download, install, evaluate. And if something doesn't 'float your boat', trash it, or be productive and change it.

PLEX86

Version: CVS **Web:** <http://www.plex86.org>

Source: Lesser GPL **Function:** Virtual machine

Although it's not an ideal situation, the fact remains that Microsoft Windows holds huge dominance in the world of personal computing and many of us are exposed to the platform on a day-to-day basis. Whether for work, play or simply experimental reasons, the ability to run Windows apps is still essential for a good number of users.

As we've seen, a number of potential solutions have popped up to make life a little easier here. It's simple enough to set up a dual-boot system, but still timewasting when you just need a few minutes with a single program. Then there's *WINE* – progressing well and capable of running a sizeable amount of software, but your mileage may vary, and *Win4Lin* (see issue 11). Finally, *VMWare* is a polished contender, but it's still proprietary and heavy on the wallet. (We'll be looking at emulation in-depth over the next few issues.)

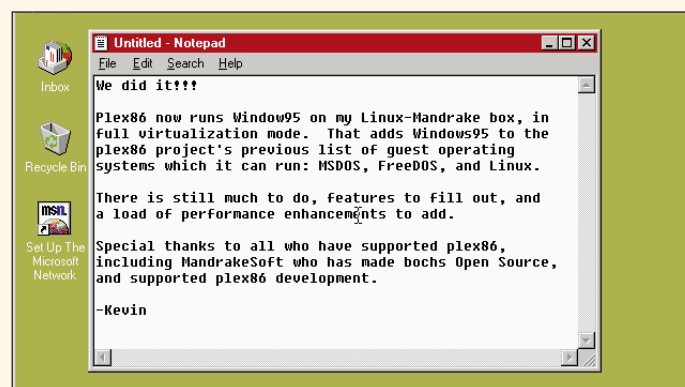
Plex86 – previously known as *FreeMWare* – is shaping up to be

another alternative. Instead of providing a Windows-compatible API layer a la *WINE*, *Plex86* takes the *VMWare* approach and provides a complete "virtual machine" (i.e. a virtual PC) in which you can run the operating system of your choice. Of course, you'll still need a copy of that OS to run in it, but there are some other advantages to this, as we'll see in a moment.

PLEXIBLE FRIEND

At this stage of development, *Plex86* can only be downloaded from the project's main website by CVS (see issue 8, p58), although a few older RPMs are still floating around the Internet. Compilation should be reasonably straightforward, but you'll need "bcc" if you want to recompile the virtual BIOS rather than use the ready-built version.

Before firing up the program, you'll also need to load the kernel module, which adds a `/dev/plex86` entry. From there, you can point the



Plex86 running Windows 95 in KDE. Reboots are no longer necessary for extensive Freecell sessions!

plex86 binary at a configuration file and get started – a few sample setups are available in the `conf/` directory to give you a hand.

Currently, *Plex86* has been tested with FreeDOS, NetBSD, MS-DOS 6.22, Linux and Windows 95 as guest operating systems. In particular, the ability to run a version of Windows was seen as a major step forward; without a doubt, this is the OS that most users want to run, and with this in place *Plex86* can start being considered a serious competitor to its commercial cousin.

However, while Windows stands as the most common choice of guest OS today, times are changing and *Plex86*'s ability to run other systems will prove to be a crucial feature. For example, Linux kernel hackers will have a safe working environment to perform dangerous testing

manoeuvres without bringing down the system. Also, if you've ever considered toying with another OS like NetBSD, *Plex86* could provide a perfect test-bed environment to familiarise yourself with the installer before going the whole hog.

Kevin Lawton, the developer behind *Plex86*, has pledged to work on performance issues which have proved to be a hindrance so far. Now that MandrakeSoft have backed the project, we can expect to see solid progress being made – *Plex86* is usable in its current state, but don't expect a lightning-fast hassle-free experience just yet.

STORY SO FAR...

Don't expect maximum mileage just yet, but the future looks promising for *Plex86*.

DigiPencil

Version: N/A **Web:** <http://uts.cc.utexas.edu/~foxx/digipencil>
Source: GPL **Function:** Sketch pad

As we saw in issue 11's roundup, where we examined a collection of the best free graphics tools for Linux, developers are tackling all areas of image manipulation and helping the platform on its way to being a worthy choice for artists. The larger suites of *GIMP* and *Photoshop* naturally receive the most attention, but smaller apps with a single purpose are still worth considering.

DigiPencil is about as small as you can get – the source archive weighs-in at 7k, so it's clear that this is modest in its aims. As *DigiPencil* is built on the Gtk+ toolkit, you'll need gtk+-devel installed and compilation is just a simple process of **make** and copying the resulting binary to a sane place like /usr/X11R6/bin.

Essentially, *DigiPencil* is a very basic sketch pad drawing tool and nothing more than that. Simulating colouring pencils, images can be created in a hand-drawn style and copied into other graphics programs, where extra modification and touching-up can take place.

DigiPencil's main window houses the drawing area, a colour-selection toolbar and 'Clear' button for starting afresh. 12 colours are available, together with a brush size selector. Sadly, there's no way to load or save images yet, let alone an undo feature, so you'll have to use a tool like xwd (or *The GIMP*) to grab the image's window and save it for editing.

Undoubtedly, *DigiPencil*'s most notable feature – and the one which



Don't be alarmed – it is possible to create sane pictures with DigiPencil.

will attract the most attention from artists – is the support for Wacom graphics tablets. Using one of these gadgets, the program will recognise pressure on the pad and allow you to erase, providing all manner of extra goodies which the standard mouse won't permit.

So, if the programmer can include few levels of undo along with file saving and loading features,

DigiPencil will be a handy lightweight tool for artists who own a Wacom device. Even with the plain old rodent you could put together some decent-looking images.

STORY SO FAR...

With the addition of a load and save feature, *DigiPencil* could become a top-notch little app.

Umix

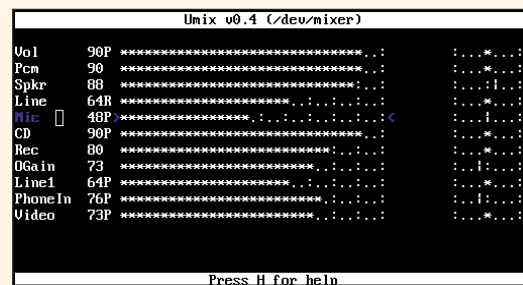
Version: 0.4 **Web:** <http://www.ionstream.fi/sakari/umix/>
Source: GPL **Function:** Sound mixer

It's safe to assume that almost all desktop Linux users have a sound card in their system these days. Getting it set up correctly can be a chore, but the number of supported cards is constantly increasing and projects such as ALSA (see issue 4, p65) aim to make the hassles of configuring cards and drivers a thing of the past.

A vital tool when you're using sound under Linux is a mixer – both as a way of setting reasonable default

volumes during startup, and also for manual tweaking when recording samples or similar tasks. *Aumix* is the default mixer in distributions such as Mandrake, but *Umix*'s author found it to "act weird, eats too much CPU cycles etc".

Currently, *Umix* only supports Linux and the OSS drivers, but through a modular design other drivers can be added in future releases. RPM packages are available (and as the default interface is text-



Each channel's volume is represented by a line of stars.

based, you'll need ncurses-devel installed for compilation). The binaries for the current release are around a pleasant 20k in size.

Umix will either run silently with command-line options passed to it, or display a full-screen character interface at the console. With the former, each channel of the sound device can have its volume level set (e.g. the main volume, treble, bass etc.) along with the option to point *Umix* at a different device than the default /dev/mixer.

With the interactive front-end,

you can adjust each of the channel's volume through the cursor keys in increments of two, and each is represented by a graphical bar.

There's also an

extra panel for altering the left/right speaker balance for each channel.

This is still a new project and a number of things have been tagged as proposed inclusions in further releases – such as Gtk+ and Qt interfaces, ALSA drivers and Free/Open/NetBSD support – but it does its job already as a no-nonsense mixer and is worth a look.

STORY SO FAR...

Nothing more than a mixer, but simple and speedy to use.

Webalizer

Version: 2.01 **Web:** <http://www.mrunix.net/webalizer/>
License: GPL **Function:** Log analysis

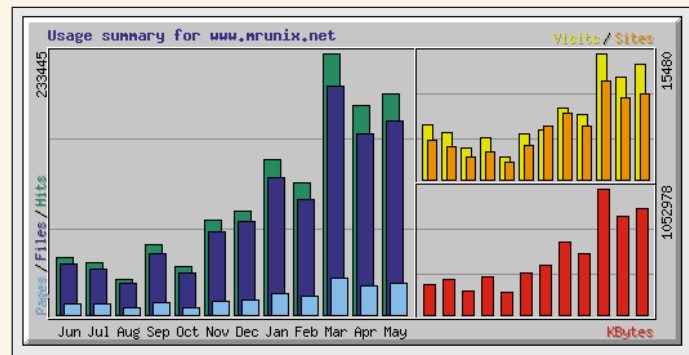
Anyone who runs a Web server – be it *Apache*, *Roxen* or one of the smaller alternatives – keeps tabs on their log files, checking for any problems or sinister activity which may pose a threat to the system. As these typically mount up to enormous files which don't go easy on the human eye, numerous programs exist to process them into something more intelligible.

The Webalizer's author started his project as a result of dissatisfaction with the dire performance and erroneous results of similar tools. Starting as a simplistic Perl script, in the last few months it has seen some major development work and now claims to be used by thousands of systems around the world.

If you've downloaded the binary .tar.gz package from the website, you can simply copy over the executable held within to an appropriate location. A sample configuration file is also

supplied as a base to start from. To compile, you'll need the GD graphics library installed (for creating the PNG graph images), and from there it's just a case of following the usual autoconf ./configure process.

Depending on the package you have installed, a number of languages are also supported, and can be specified at compile-time. All *The Webalizer* needs to run is the location of a log file – typically /var/lib/httpd/logs/access_log. The type of log file to be parsed (CLF, Wu-ftp or Squid) can be specified, and output will be dumped into the current directory.



Output from the logs produced by the server for *The Webalizer's* site.

The Webalizer is more than happy working with gzipped logs, has DNS lookup capability (if compiled in) and boasts a whole host of other features including yearly, monthly, daily and even hourly usage statistics. There is also the ability to display usage by URL, referrer, browser, username and location (depending on the content of the log file).

Output is generated as an HTML file, and a PNG graph image is also produced for a more visual

representation of the data. *The Webalizer*, by its very nature, is hardly the most exciting utility on the planet, but it does a very specific job solidly and is worth considering for those running a web server and need regular usage statistics.

STORY SO FAR...

A fast and reliable server report generator with a thorough stack of features.

Summary by Month										
Month	Daily Avg				Monthly Totals					
	Hits	Files	Pages	Visits	Sites	KBytes	Visits	Pages	Files	Hits
May 1999	6377	5570	903	455	10484	884568	14119	28004	172671	197696
Apr 1999	6216	5394	858	419	10087	821968	12594	25758	161844	186504
Mar 1999	7530	6582	1046	499	12128	1052978	15480	32432	204059	233445

Output from the logs produced by the server for *The Webalizer* as an HTML table.

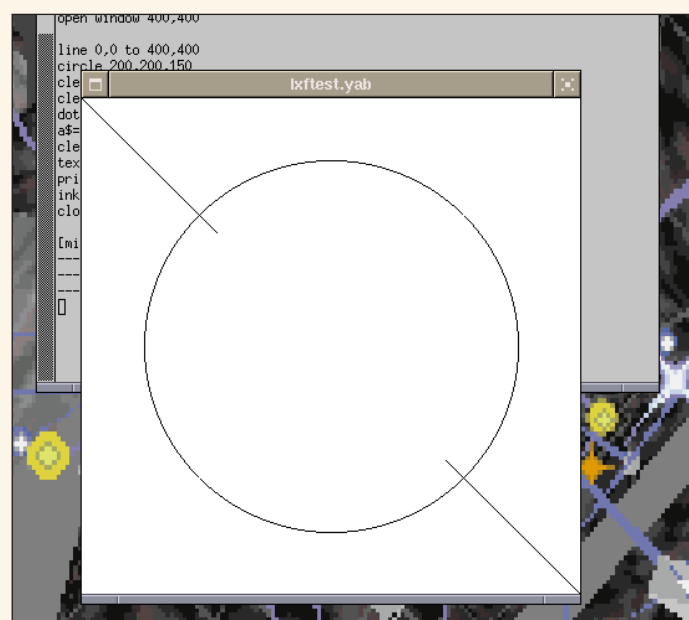
Yabasic

Version: 2.66r5 **Web:** <http://www.yabasic.de>
License: GPL **Function:** Programming language

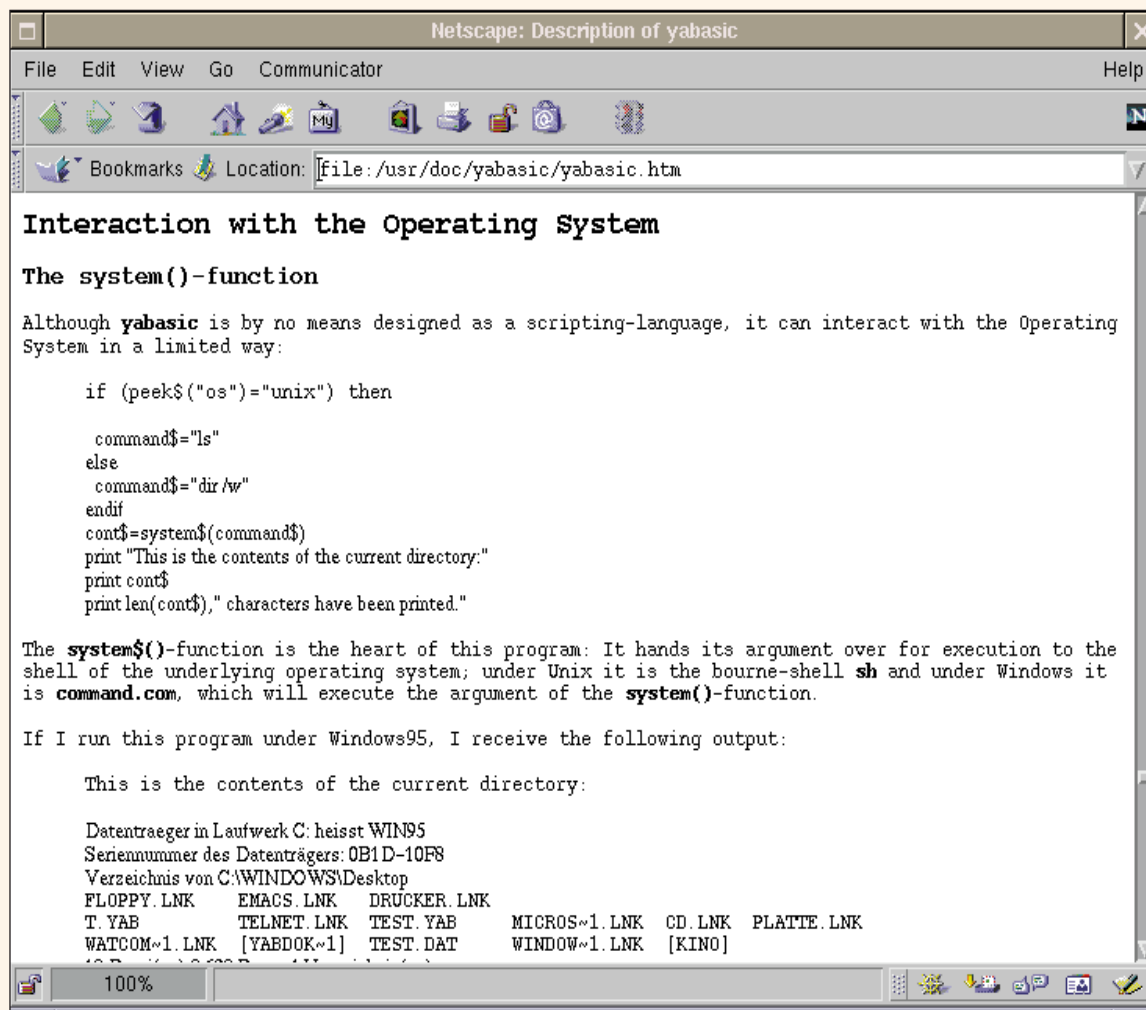
In today's world, the BASIC (Beginner's All-Purpose Symbolic Instruction Code) programming language tends to be overlooked in favour of C/C++, Delphi and the new generation of ultra high-level languages. Despite Microsoft's best efforts with its "Visual" incarnation, BASIC is still commonly regarded as solely a newcomer's language and

lacking in terms of structure and power – essential factors when large projects are taken into account.

On the other hand, there's no doubt that BASIC offers a friendly introduction to coding with its English-like keywords and straightforward syntax and structure. Of course, it's hardly the ideal tool for writing operating system kernels and



Not the most thrilling graphical extravaganza, but a simple example program from the *Yabasic* docs.



Yabasic's documentation is comprehensive and goes into detail in tricky areas of basic BASIC programming.

the like, but for smaller tasks it can prove to be ideal. More importantly, many of us were brought up on the BASIC interpreters of the Spectrum and C64 era and are still familiar with the language as a result.

A number of BASIC variants exist

for Linux and UNIX systems, but one of the most advanced is *Yabasic*, having seen consistent development work over the last few months. RPM packages are available from its site, and are only dependent on ncurses (for screen handling at the console),

and common X libraries, which most systems have installed by default.

Before commencing on a coding session, it's worth a look at the HTML-format documentation page which details the available command-line arguments and gives a few sample programs to explain its implementation of strings, loops, subroutines and so on. While it won't teach you BASIC from scratch, it's a fantastic and well-written guide.

BACK TO BASICS

To start coding, you can either opt to fire up the interpreter at the prompt and enter each line by hand, or alternatively point it at a pre-written .yab file (as created in any text editor) which it will duly run. A nice touch is the recognition of *#* comments, so you can add the standard *#!/usr/bin/yabasic* at the start of files to run them like any program.

In terms of *Yabasic's* features as a language, various arithmetic and trigonometric functions are included, alongside for-next, repeat-until and while-wend loops. New functions can be defined through subroutines, and extra libraries (generally comprised of further subroutines) can be included into the main application.

One of *Yabasic's* best features, though, is the ability to create graphics through an X window. Various basic drawing commands are included – circle, line and clear etc. – and bitmap manipulation and printing is also supported. Although no method for grabbing the X pointer position is documented, *Yabasic* could be used to create simple front-ends for programs using keyboard input.

Yabasic exhibits all the hallmarks of a mature and flexible development tool. Obviously it's no match for

C or Perl when considering certain projects, but at the same time it has enough work on the structure and in-built functions to make it a decent choice for smaller programs. With package sizes so small, it's easy to pass around a program together with its interpreter.

At the same time, it doesn't stray from the familiar aspects of BASIC and consequently can be used with the masses of old magazine tutorials and books that have covered the language. Anyone wanting to get started in programming, but finding the current collection of Linux development tools too daunting, are definitely advised to give it a go.

STORY SO FAR...

BASIC hackers or those wanting an easy introduction to coding should check it out.

MODERN INTERPRETATIONS

Although a few middle-of-the-road solutions exist, most programming languages in use today are either compiled or interpreted. With the former, the source code is fed through a compiler with binary machine code executable files as a result, while the latter involves the software stepping through each line of the code and working on the spot. Of course, certain software demands compilation beforehand and – for speed issues – compilers remain the most common choice when writing many apps. Interpreters like *Yabasic* offer their advantages, though; when problems or unexpected turns arise, the interpreter can be halted and changes applied quickly before continuing. This can improve the development process considerably.

BASIC is the most widely-known interpreted language, but typical Linux systems still make full use of interpreters – shell scripts, Python and Perl tools all work in a similar fashion and are commonly used when super-fast execution speeds aren't essential.

Gnomp3

Version: 0.1.7 **Web:** <http://mattpratt.portland.co.uk/gnomp3.html>

License: GPL **Function:** MP3 player

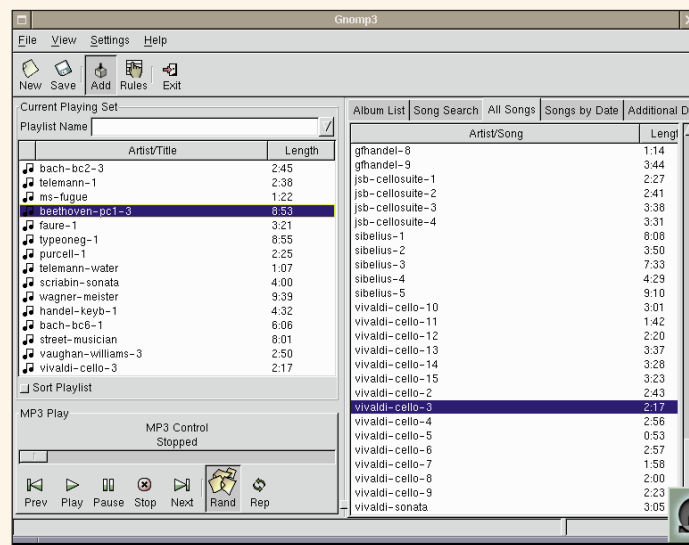
Thanks to their excellent balance between file size and sound quality, MP3s are on the road to being the de-facto standard for storing and exchanging music through the use of computers. We've already covered the superb *Grip* and *XMMS* in previous editions of Hot Picks, but several other MP3 players are in development and Gnomp3 is worthy of a quick look.

As the name suggests, *Gnomp3* is a player for the *GNOME* desktop environment. Binary RPMs are available from the site, but as they're built for version 4 of Red Hat's package tool you might need to build from the source – this shouldn't be

troublesome, as long as you have the usual *GNOME* development libraries and *Glade* installed.

Putting emphasis on smaller individual selections rather than working with whole collections at once, the blurb states: "users listen to their collections in smaller playlists, instead of as a whole, and may manage a number of playlists".

Gnomp3's display is split into two; the left pane contains the current nano-playlist, while the right has various tabs for searching files by name and date. This works well when huge numbers of MP3s are being managed, and does its intended job of creating smaller playlists well.



Gnomp3's main window, with the list of all files on the right and selections down the left.

Being *GNOME*-based, the player sports drag-and-drop for MP3 files. Similarly, *XMMS* support can be enabled at compile-time, in order for that program's playlists to be used. All the other usual features are present, such as random play, repeat and playlist sorting (although we encountered some indecisive action on behalf of *Gnomp3* when attempting to sort).

A preferences box for modifying the colours, playing engine and list

names etc. is available, along with a rules editor to create advanced searches. At this stage, while it's highly polished and coming along nicely, it's still prone to glitches and erratic behaviour and isn't quite a threat to *XMMS*. Yet.

STORY SO FAR...

With plenty of potential, *Gnomp3* just needs more work on its stability.

Cronos II

Version: 0.1.0 **Web:** <http://cronosII.sourceforge.net/>

License: GPL **Function:** Email client

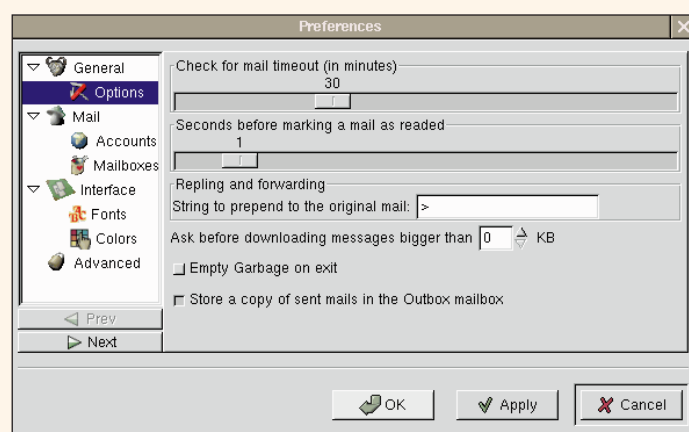
Back in issue 3, we took a look at a bunch of the best Linux mail clients in our roundup. Since then, developers have been beavering away at a number of similar projects – text-based programs, *KDE* clients and *GNOME* mailers are all being worked on as we speak, and many are reaching the stage where they're fully usable on the desktop.

Cronos II is a revolutionary app (well, namewise). Breaking down all barriers and shattering the long-standing tradition of UNIX mail user-

agents like *Elm*, *Pine*, *Spruce*, *Balsa* and *Mahogany*, *Cronos II*'s hackers have opted for a non-tree-related title. So, wipe the sweat from your brow, take a deep breath, and prepare to enter a new era where mailers aren't named after wood.

FIRST IMPRESSIONS

Currently, the application is only available from the project's website in .tar.gz or .tar.bz format, so you'll need to compile it from source. Fortunately, it's not reliant on any obscure



Cronos in action, with the main mail window and Preferences box open.

libraries; being designed for the *GNOME* desktop, you'll need to have *gnome-libs-devel* and *gtk+-devel* installed before starting. From there on, it's the usual case of *.configure*, *make* and *make install* to get it up and running on your system.

The hackers behind *Cronos* are targeting newcomers alongside more experienced users. So, while it's still

at an early stage of development, they've set out to create a clean and simple front-end together with a bundle of tweakable options to suit the more advanced users. Aiming to satisfy all kinds of users is always a difficult task but, as *Pine* has proved, it is possible through careful design.

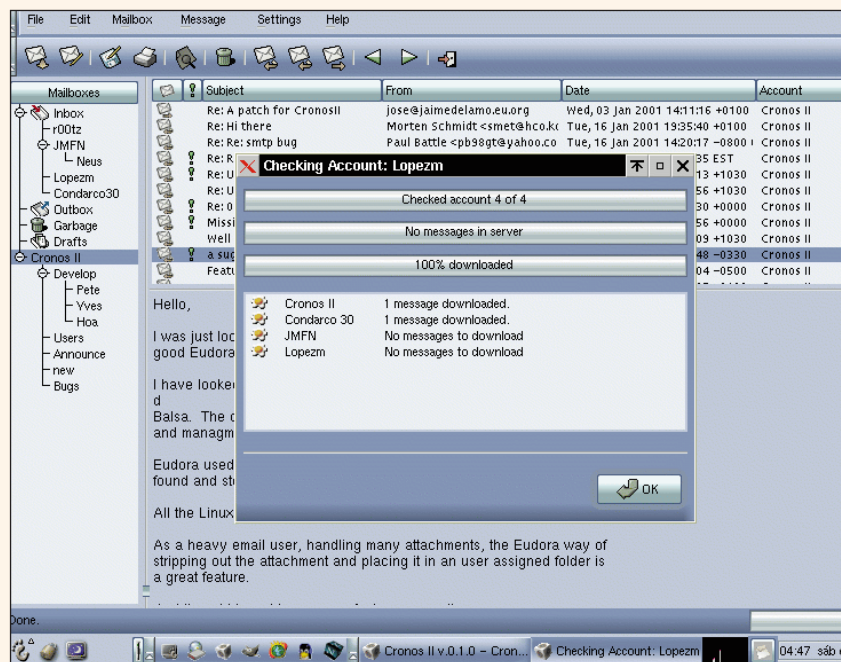
Cronos' interface features the typical three-pane layout, with a list

TWEAKING AND TUNING

As Cronos' hackers are aiming to please advanced users alongside their newcomer counterparts, the Preferences box supplies a range of tunable options covering most aspects of the program. Timeouts, mail-size limits and quote strings can be modified, in addition to the fonts, colours and even title-bar text. It's nowhere near as comprehensive as Mutt or Pine, but many features have yet to be implemented.

Configuring mail servers is also achieved through the Preferences box. POP3 and SMTP servers (along with their ports) are entered and assigned to a specific local folder, and you can choose to leave messages on the server after downloading – Cronos will recognise what it has grabbed, and won't spend time fetching it again in subsequent mail checks.

of message folders down the left, the message index sitting at the top, and beneath that, the contents of selected emails are displayed. Under



Cronos II is ideal if you're looking for a simple, no-frills email client.

the menu lies the toolbar, which holds a number of action buttons decorated with the usual clean-style icons. In all, it closely resembles the other major GNOME client – Balsa – and, as a result, is simple to get started with.

CRONOS IN USE

A few steps need taking to ensure maximum user-friendliness for the newcomer, though. Anyone using Fetchmail (or something similar tool)

and keeping messages on a local spool in /var/spool/mail will have to tackle the options screen and connect the appropriate folder icon to it, as Cronos assumes it'll be pulling mail itself by POP3 initially.

The application also includes a message composer, although this is a simplistic affair, offering the basics of header editing, colouring of quoted text, and the ability to postpone mails for

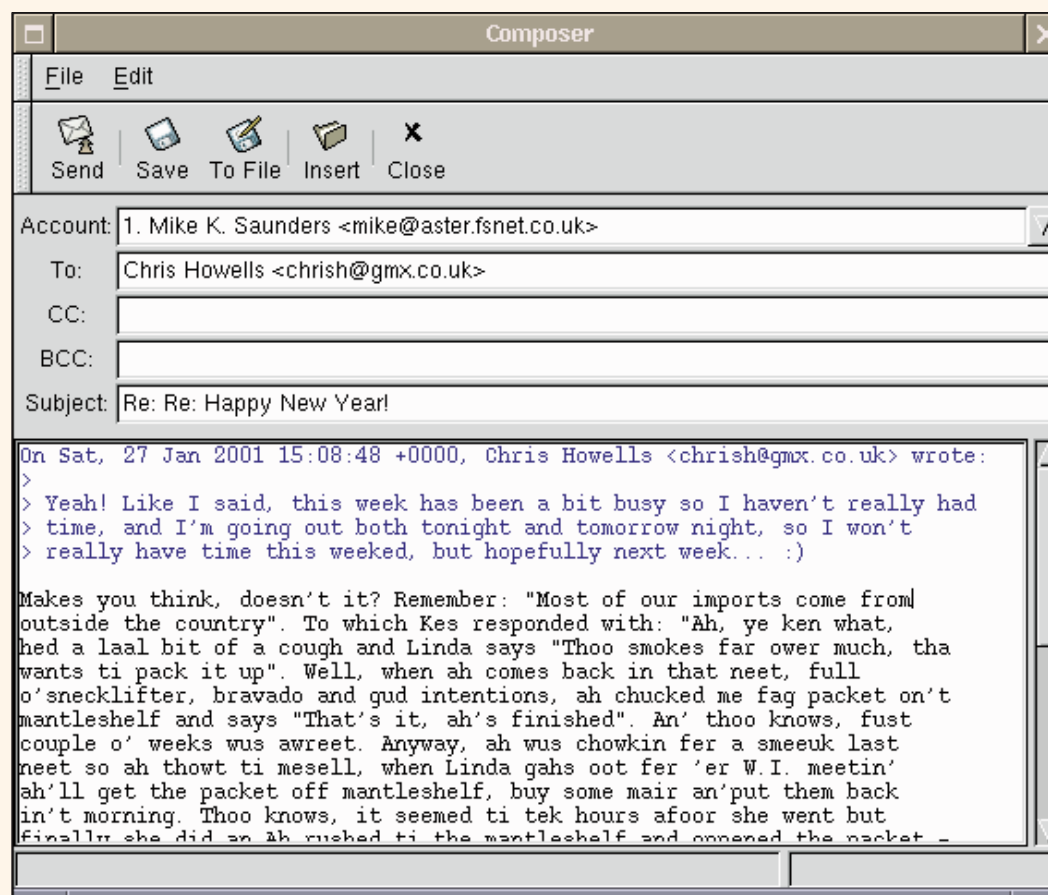
later sending. Advanced features such as spellchecking or search/replace facility may arrive in later releases. We suffered the occasional crash when adding attachments, but it's still functional as a frill-free editor.

One major omission, though, is an address book – whether or not the coders behind Cronos choose to work with GnomeCard, some form of contact management is essential. Several other features are listed in the TODO file as proposed inclusions, such as HTML, MIME and IMAP support, a filtering system for automatically sorting new messages, and the ability to use PGP.

All things considered, Cronos is well on the road to being a top-notch GNOME mail client; compared to Balsa, it's over 1Mb easier on the memory in general use, and proved to be a fast performer. Coupled with the decent array of configurable options, PostScript printing (with preview) and general ease-of-use, the mailer is already worth considering for lightweight users and we're looking forward to its progress in the future. **LXF**

STORY SO FAR...

A small and speedy GNOME mail client, but still lacking a few notable features.



The message composer sports highlighting of quoted text.



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MAILSERVER

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Welcome to the Mailserver, the place where the most important people in the Linux community get to write in and tell us what they think about anything Linux related. Who are these people? Why, they're you, of course.

This month you'll find comments and opinions on everything from Microsoft's .NET, through CDs and Amigas to suggestions for our roundups and a few hints and tips thrown in for good measure.

We enjoy receiving all your emails and letters relating to the magazine and all matters Linux. More than that, it gives us a very valuable insight into what sort of magazine you want to read. Nobody has ever accused a Linux user of being shy or short of an opinion on any given subject, so why not share your views with us, and indeed, all the other thousands of Linux enthusiasts who read this mag.

The only thing I would ask you is that you include your name, and a rough geographical location at least. It may be obvious to you who you are, but we like to know who our mail is coming from!
Nick Veitch
Editor

Getting .NET Straight

As a programmer who enjoys working in both the monopolistic and open communities, I really value and enjoy your magazine. However, I am distressed with (not only your, but everyone in the open community's) continued assertion that Microsoft's .NET technology is "nebulous" and "unclear" (December 2000 'Comment' by Richard Drummond). Some have even suggested that it is vaporware, and that it is just another marketecture term like ActiveX.

Microsoft's .NET vision is remarkably clear. There are three primary aspects of the 'platform':
1) The Common Language Runtime (CLR), a virtual machine for .NET bytecode which is called Intermediate Language (IL). All .NET enabled languages compile to IL, which is ported to specific machines where it is interpreted to native instructions. This is a clear concept, well documented by both the Java and Visual Basic p-Code crowds. The only difference is the make-up of IL.

2) The Common Language Specification (CLS), a road-map to making your language compatible with the CLR. If you can provide a mapping to the CLS specified types as well as provide a mechanism for inserting metadata into your code, you can make your language of choice .NET compatible (see Perl, Python, Eiffel, COBOL, etc.).

3) The .NET Frameworks, an object oriented replacement for the Win32 API. The Frameworks look and act very much like the Java class libraries, and serve the same purpose.

In addition, the effort has been made to XML-ize everything in the

platform, from RPC calls through SOAP to type and interface descriptions. Even the configuration files for the platform are XML.

Yes, .NET looks like Java, the platform. Yes, C# (the new .NET-only language) is syntactically similar to Java, the language. Some might argue that C#/.NET amount to intellectual property theft, and I won't get into that argument. But this community continues to put shutters over its eyes, denigrating and dismissing this latest push by Microsoft, and does so to its own detriment. There is nothing nebulous about .NET: it is real, it is here today, and it makes Microsoft's OS's one step closer towards the open community (by subsuming open technologies like XML, HTTP, etc.), and one step closer to actually competing with Java. It is an important development which we should all become, at the very least, familiar with.

Justin Gehrtland



Has Rich been unfair to Microsoft over .NET?



Many thanks for your thoughts on .NET. Of course, at the time Richard wrote his piece, there were very few details about the .NET platform or C#, so I guess that explains some of his reaction.

I'm sure there'll be some debate between the purists and pragmatists in the open source movement on this issue, but essentially what Microsoft 'seems' to be doing, from a cynical viewpoint, now that they aren't allowed to screw about with Java, is develop yet another Microsoft only 'standard', and try to coerce others into using it (just as they have done with their interpretations of HTML and various other web technologies). So I think the problem with expecting the open source community to 'leap aboard' is that Microsoft have a bad reputation when it comes to such things. If they actually want to foster a new web development platform which will be taken up worldwide, perhaps they should open source it.

Revolutionaries

We are definitely living in a Linux revolution and I'm proud to be part of it! Enjoyed the latest issue of *Linux Format* and I use this as an important source of information. I was completely absorbed with the enlightening information on Netscape 6. Keeping on providing and I'll keep on reading!

Sharon Diane Roberts
Port Orange, FL

Glad you like the mag. If any of our readers have interesting uses for Linux, or a salient Linux story, why not drop us a line.

User groups

While I was in India I became involved quite extensively with the Linux

movement. Presently I subscribe to *Linux Format*. keep up the good work. However with reference to the Linux User Group pages that you are publishing, I have the following to say: India has its own country-wide and very active Linux Users Group.

They have a website: <http://www.linux-india.org>. They also have mailing lists and several localised sub-groups for most major cities etc – check out the website for details.

Sometime ago you did cover the 'localisation' effort that is going on in India – it was a good article.

Your list does mention India but references a website which is not well known there. This is not about official or unofficial but recognising good work that is going on.

Vivekananda L. Baidoor,
Maidenhead,

Many thanks for your mail. Almost all of the user groups included are done so on the basis of recommendations from members or other Linux users – we don't restrict a LUG entry in any way, so we'd be happy to include the details you have given us too.

Ease of use

I stayed with the Amiga and all of their "promises" up till a year ago. So I still have a whole bedroom dedicated to A1200 Towers (with CD-burners), an A3000 with a sound card to copy vinyl to CD, and a couple of A2000s, one with a NewTek Toaster. Plus, piles of old magazines

with cover disks and CDs. Then one day, I discovered I could buy a motherboard and some memory and run the dreaded Windoze. Soon I was burning CD's, recording music, using things such as scanners and new printers. Oh yes, I suffered crashes, a few viruses, but it did not equal the time I spent in frustration trying to do things that were nearly impossible on the Amiga. One day I decided to run SuSE 7.0 Pro, on my system. Perfect! 1600 programs for nearly free!

But my parallel scanner won't work, my Epson 777 printer went crazy and would not shut off (just kept printing garbage), I can't watch DVD in full screen, I can't get my friends on instant messaging and I had to get another modem, to burn CD's I use my old HP4020i from the A1200 tower but have to burn at single speed, using Netscape is really quirky, I found one free Internet service that I messed around with to get working, I can't use a call forwarding program while I am on the 'net, etc. etc.

I must say Linux is a step up from the Amiga, it does let you use some modern day technology, but only if Linux supports it. And it's great that people create these programs up for Linux users for free. The down side is – and I hear it all the time – the ones that do the programming usually do it in their free time because it is a hobby or they need a driver or program for their own use. The Amiga community survived on this very



same idea for a couple of years, then most users switched to Windoze. But now, since we are using Intel machines to run Linux, instead of the Motorola 680X0, we can switch to Windoze to run the programs that Linux does not have.

At the moment, in order to download and run Linux programs, we have to do loads of typing, and be in the right directory, etc. I really don't mind this, but if you think older people and kids will switch to this platform and be able to do this, you're probably deluded. In Windoze, all you have to do is download, open it up and it automatically becomes a program in the file you choose. I guess my point is: the old Amiga community will feel at home with Linux, but Linux has to make the desktop environment easy-to-use, and people should be able to go and buy new toys that will run on Linux. I really want to run Linux all the time, but I have to switch OSs constantly.

For the luxury of easy installation I am willing to pay for software that would run my hardware.

Dennis Benson
via email

This is not unlike many of the letters we receive here, but Linux for desktop use has improved quite fantastically in the last year. You only have to look at products such as KDE2 and Nautilus to see that the needs of the average desktop user are being addressed, and as Linux becomes more popular, the situation will only improve.

Webmin

I have just become acquainted with *Webmin* (www.webmin.com) and I am amazed at the this fantastic web-based Unix configuration package.

You guys probably know about it but do you think it would be a good idea to give your readers a little information. Don't get me wrong, you

are all doing a great job, but when something this good is available it can only help Linux get stronger!

Wayne Lawson
Manchester

Webmin is actually a very cool piece of code, which is why we featured it in Hot Picks back in Issue 9.

Spot the Ball's

When your lacking a verb, perhaps your your should be your you're. Is it a competition or just one big your'n?

Now that your thoroughly confused, as the old saying goes: "fruit flies like a banana but time flies like an arrow".

Meanwhile, Nerdish rules in the LXF office.

Chris Thoday (63 1/2),
Pedantic old twit.

P.S. Edit this letter at you're peril.

I see what you are getting at (if you write in full, less chance of making a mistake). I don't suppose we can claim it was a printing error? We now have a fully qualified pedant of our own in the form of Andy Channelle, so if you spot any more split infinitives or whatever, feel free to upset him. ➔



A Fruit fly (drosophila) yesterday



If you want your LUG featured, send us the details!

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LETTERS | your views

→ CD-Wrong

First off let me say that I enjoy and appreciate your efforts in producing a Linux magazine, even though it is usually two to three months late here in Australia.

Now, my problem: on examining December's CD I found that there were several items (directories) not included even though they were listed on the the CDs web pages. The items in question were the Hotpicks, Gnome, Omnis Studio and Featured Stuff. Was the proofing of the CD was lax or was it just an oversight???

Either way I still enjoy reading the magazine and consider that the inclusion of more articles which explain program usage in simple terms, such as how IPCHAINS actually work, with examples, would be a boon. The HOWTO articles for Linux all seem to have the opinion that the reader is versed, to a certain extent, in the use of the article's subject. This is not the case in many instances and newbies, like myself, often become even more confused after reading a HOWTO than we were before reading the article.

Again thanks for an excellent magazine.

Wallace Mills MCSE MCP
System Administrator PC Ward co

We have had a few problems with the CD (the directories you mentioned were left over from a previous month), but our new CD editor should be on the ball from now on. With regards to your other point, striking a balance between new and experienced users is a very difficult task, but your letters and experiences help us to see what we're doing right and where we could concentrate our efforts a little more. Which brings us to...

More CD woes

Rather than ask for suggestions on what to include in the next CD, why don't you first ensure that what you provide can be installed???

I am sitting here with your November edition and trying to install Corel *PhotoPaint* and *OpenOffice*. Both give me a 'permission denied' message when I try to run the install

script. The file permissions on both files are 777. I have installed enough apps on my workstation to know that something isn't right here. or perhaps you can enlighten me.

One file on the CD says there are installation instructions in the magazine. If that is the case, you have certainly hidden them very well!

Sam Varghese
<http://www.gnubies.com>

According to our reader support staff, turning off 'HTML view' in the interface should allow you to install both apps.

Quanta Leap

I am most probably the 131st correspondent to point out that only *Quanta-1.04* for *KDE1* and not *Quanta-2.0b4* for *KDE2* was available on your cover CD-ROM. But I would also like to be the 131st correspondent to point out that that this was not a problem] as I had already downloaded the excellent *Downloader for X* and simply set it to work. Any chance of the latest *SmoothWall* on the next disk? Keep up the good work.

Nigel Pauli, Northwood
Middlesex

Well, I'm pleased that you got that sorted out. Actually, nobody else did mention it! SmoothWall will hopefully be re-appearing on the CD soon, there have been a lot of changes since the last version we featured!

Amiga Linux

It seems that the term "PC" indicates to most people a Windows type computer, but I am sure that there are many users who still have Amiga "personal computers".

I seem to remember reading somewhere that it is possible to download Linux system software for the 68000 cpu series, and I would certainly welcome the chance to try Linux on my Amiga 4000 030 desktop computer.

If enough readers contacted you, would you consider running tutorials covering Linux on the Amiga?

David Longstaff
[via email](#)

I'm sure there are too. We did include a basic Debian install for Linux on a past CD (issue 8).

Regarding tutorials; pretty much all our tutorials are applicable to running Linux on the Amiga, the only one I can think of that wouldn't be is the Multiple Linux tutorial which talked about some x86 only distros. Basically, when you are running Linux on an Amiga, you are running Linux, and the platform becomes irrelevant to a great extent. There are some issues regarding hardware support on the Amiga platform, which may make an interesting piece for the future.

Second Class

I feel like a second class citizen...

After waiting eight issues to get it you finally put Debian for Amiga on the cover CD.

But where is the two or three page install guide that all your PC owning Linux users got. Instead we get a pitiful half a column telling us to read the Docs on the CD. Are Mandrake Installers or SuSE installers incapable of doing the same thing. Stop treating us as second class citizens. How can you make up for this minor Faux-pas. How about the APUS files for Amiga Debian with a much better installation instructions in the magazine? Other than this great mag, keep up the good work.

Steve Cooke
[via email](#)

Well, because we tend to think that Amiga users know what they're doing ;-) Seriously though, there was a whole load of stuff on the CD, and since the installation merely required you to run a script, we thought 'How hard can it be?' We are looking at putting together another Debian based distribution for use on a variety of architectures. I can't promise that you'll get a ten page installation guide for the Amiga version though. It would be nice to get some feedback from people who installed the first one: i.e. what problems you found.

Roundup

I'm writing to comment on the Graphics Roundup article in the

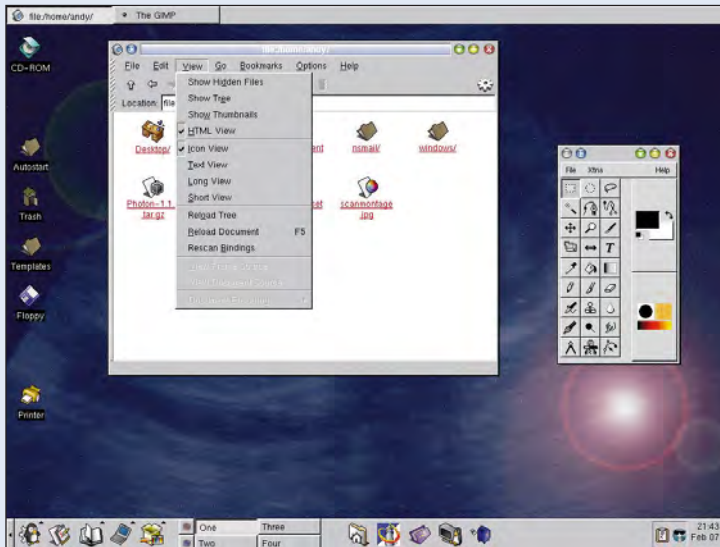
February 2001 issue. Although I found the article useful and interesting, I was a little disappointed overall and felt I should comment.

I am not sure that Mike Saunders was clear as to his objectives in comparing the tools presented. Although he mentioned the importance of scripting throughout the article, the ranking criteria did not include scripting as a separate measure. *ImageMagick*, in particular, suffered from this anomaly, even though he did give it an honourable mention in the conclusion. As somebody who requires a proper scripting facility, accessible from shell scripts and the like, to manipulate images, I find *ImageMagick* indispensable. The other tools presented are just plainly not usable in this regard.

The overall feel of the article is that Mr Saunders was more interested in the graphical user interfaces (which can of course be very important) than in the effectiveness of the specific tools for the jobs they were intended. Although I also am a big fan of *The GIMP*, its purpose is completely different than something like *ImageMagick*. However, as he says, the best thing about all of these tools is that they are free and there's nothing stopping us from having them all installed on our systems!

The inclusion of both bitmap and scalable object drawing tools in the same article also leads to some lack of focus. The two types of tools are markedly different and, again, serve completely different purposes. It is unclear how one could possibly compare them. Two different sections to the article would probably have been more appropriate.

Finally, as a long time Unix (and GNU/Linux) user, I was also disappointed at the omission of the venerable *XFig* from the list of tools. Almost every distribution includes it and it is, in my opinion, one of the best drawing tools available. Mr Saunders does mention *XFig* in passing but a full comparison, especially with *Sketch* and *KIllustrator*, would have been interesting.



Kfm is good, but it's getting a little long in the tooth. Time to upgrade?

Nevertheless, in case Mr Saunders thinks I am being overly critical, I enjoyed reading the article and look forward to many more. Keep up the good work! I particularly enjoy your Hot Picks section, especially as the software is included on the CD! And do keep putting recent Linux distributions on the disk.

Eric S Fraga
West Sussex

Well, the graphics roundup was a little different than previous ones, in that it covered the general area of creating graphics, rather than previous ones which have been more specific. Sorry if you think we've left some out (Xfig, as you say, is fairly ubiquitous and probably should have made the cut, as a reference point if nothing else). We'll try harder, I promise.

Roundup II

Noticeably absent from your December 2000 review of Linux FTP clients was *kfm* which is an integral part of KDE 1.1.2. I have been using SuSE 7.0 and find it rock-solid as my network management and development workstation. In experimenting with the KDE file manager, I have found it can do FTP as well as basic HTTP.

These features can be accessed many ways: for example, if you single-click on a .html or .htm file, the active *kfm* window enters HTML mode and displays the file as a web page. One

annoying factor of this is that if you open a directory containing a file called index.htm, you can't actually view the files in that directory – it just opens the index.htm file. I haven't worked out how to turn this off yet, if indeed you can.

Even more relevant to your article is the URL bar. I use this daily to transfer files around on the development systems I administer. How I usually use it, is to type a URL of the form ftp://user@host in the URL bar which then logs in as the relevant user and displays files as if they were local, even allowing editing of remote files (the save functions even work properly!)

Leaving the username part out of the URL will result in an anonymous login, great for grabbing files from your favourite mirror site. Drag-and-drop capability gives you the option to move files between windows and file transfer status is displayed in the form of a pop-up window with a progress indicator.

Unfortunately in the version I'm using, recursive drag-and-drop is not

yet implemented, so I tend to use "scp -r" for that. We are moving to exclusive SSH in our network which means FTP will be phased out, but there are a number of SCP clients currently under development, even one for KDE2!

Simon Marko, Telstra Specialised Operations (IP), Australia

Doh! Well, again, there is always going to be something that gets left out. Thanks for the tips on Kfm – Konqueror works the same way and an upgrade is well worth it. You can turn off the automatic display of index.html files by turning off the switch in the view menu.

*Perhaps, where we can't mention everything, in future we could just list some of the alternatives? The reasons some things get left out are because **a)** they aren't anywhere near finished. **b)** they are unmaintained or at least haven't had a recent release. **c)** we've never heard of them.*

Some of the things people writing in about fall into the third category and I guess one way around this is to advertise the subjects of roundups in advance, and invite people to email us to make sure their favourite is included. Kscp looks pretty interesting, perhaps we should do a roundup on scp clients then...

A continuing theme

Derek Logan complements you on your lack of advertisements, however, I would like to see much more. I'm not an ISP, though I work for one, so Penguin, Dedicated Servers and their pals are good for the sponsorship, but most home users are not interested. I would like to see more adverts by the likes of Cube Computing. I only buy Linux specific magazines, and find I'm losing touch with what is out there. I

have to buy something like *Computer Shopper* which, except for ads, is virtually useless to me. Can we persuade some more Linux box shifters and compatible component suppliers to advertise? We all need to know where to buy.

One thing I cannot understand is Ian Caldwell's approach to trying out Linux (See issue 11). This kind of messing around with installs is what gets M\$ users in such trouble. You install so much stuff the file system gets shot to bits and eventually you screw everything up.

Windoze has always been easy to install because people who use it buy a box from a box shifter. Eventually, it dies and they send it back to base

I started off with RH6.0 about a year ago and I am now onto RH6.2. Not because it is the best, but because it's the easiest to get into. Also staying with the same system has given me time to learn Linux. I am now looking at other distros – others I know use Mandrake, SUSE etc. Each have their own merits and, as you were saying, we all run Linux.

Christian Chapman
Viatel Global Communications Ltd

I take your point about advertising, but short of arming our ad sales people and authorising them to use whatever means necessary to force people into booking space, I don't see what we can do. I would have thought it would make sense for some of the bigger mail order operations who do have some sort of Linux support to advertise, but that's their decision. I certainly agree with your last point. Most of the differences between distributions boil down to the configuration tools, package management, where things get put and installation. Once you have one installed, you can do pretty much what you want with it.

*I can see the frustration that drives some people to swap distros and re-install every month: they hope that each new one will support some feature or hardware the previous one didn't, and rather than finding out how to get it working, it's easier to migrate to a new distro. **L.M.***

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

Kustomising KONQUEROR

Konqueror 'does it all', but what if you want to do it all differently? **Jono Bacon** reveals how to make the most of the KDE browser/file manager tool.



Since the evolution and development of UNIX and Linux, there has been the concept that the Operating System should consist of a set of tools that do one thing, but do it really well. This idea is then enhanced by the concept of stringing these separate tools together to form a more complicated but useful mechanism. This concept has been particularly apparent in the command line world where users can use pipes to mix together separate command line tools. Although this concept works well, it does have its limitations, particularly for the 'kitchen sink' generation of users who want applications to do everything in one place.

An example of a 'kitchen sink' application is the KDE web browser, file manager, file viewer extravaganza *Konqueror*. *Konqueror* was an addition to recently released KDE 2.0 desktop system, and primarily extended the functionality of the KDE 1.x desktop application *kfm*. The idea behind *Konqueror* is that it provides a one stop viewing portal for viewing a variety of different types of media. This includes web sites, FTP sites, hard disks, pictures, video, documents etc. Although *Konqueror* gives the user the ability to view these varying types of media in one place, it does so in a fashion that still works in the style of the command line 'one application doing one thing well' concept. *Konqueror* does this

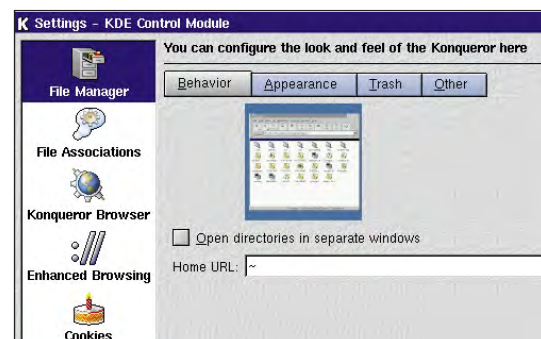
by using an embedded viewer depending on the file type. An example would be if you wish to view an .avi file; *Konqueror* would load the *aKtion* video player within the *Konqueror* window seamlessly. I have been a KDE developer for some time now, and while I have not worked on *Konqueror*, I have watched its progress with a keen eye.

In this article I am going to show you how to get the most out of *Konqueror* for both web browsing and for file management/viewing. With *Konqueror* being such a versatile – and big – application, I can only cover the main functions and capabilities, although there are many more available. Also, at the time of writing I have the very latest *Konqueror*, but by the time you read this, it could have a slew of new features. Check <http://www.kde.org/> for more details.

To get started with *Konqueror*, let's first load it up. You can do this by either selecting 'Konqueror web browser' from the Internet section of the 'K' application starter or from the *Konqueror* icon on your panel or desktop. What you see in the body of the window are the About *Konqueror* pages. You can access these at any time by typing **about.konqueror** into the location bar.

BROWSING THE WEB

To get us started, we will first look at how *Konqueror* can be used for web browsing. In my experience of using Linux for the past four years, I have not found a native Linux web



The Konqueror Control Centre.

browser that is as capable as *Konqueror*. Let's first begin by typing in any site you need into the location bar. Once you have typed in www.kde.org for example, the web site will be displayed in the main body of the window. At this point we can configure *Konqueror* to customise your web experience. To do this click on **Setting->Configure Konqueror**.

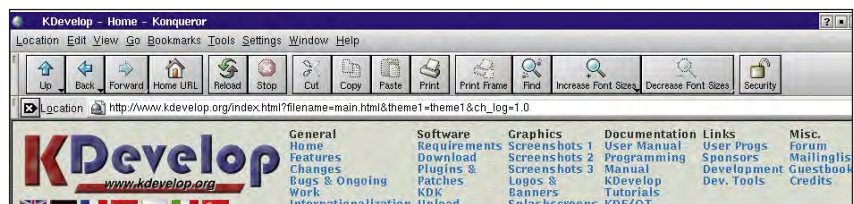
Inside this configuration box, we can change some of the visual aspects of *Konqueror*, as well as its capabilities. This houses the setting for all of *Konqueror*'s capabilities, but we'll just look at those features relevant for web browsing at the moment. To configure the application's web browsing capabilities, click on the Browser icon on the left hand side of the box. This section is for general web settings. Along the top of this window you'll see some tabs for more specific configuration. The default tab is the HTML tab, and here we can change how the cursor reacts over links. The second tab is named Appearance, and here we can change the font type and size for the styles a web site may use. A useful feature is the minimum font size. I would recommend you set this to 12 for comfortable reading, although this is obviously a personal thing. Moving onto the next tab, we can adjust Java settings. *Konqueror* is quite configurable for Java, but the most important setting is at the bottom where you can specify where *Konqueror* can find Java (See sidebar, right). To enable Java within *Konqueror* you need to check the **Enable Java Globally** box, although you can also be more explicit in defining how it handles Java from certain sites. Let us, for example, assume that badjavasite.com has some badly coded Java. You can click on the Add button in the Domain Specific box, and a box will pop up. In this box you can type in the badjavasite.com domain, and select 'Accept' or 'Reject' from the combo box to select whether you wish to run the Java code on that page or not. This feature can be very useful for sites with too much or badly written code.

Next up are similar options for JavaScript. Here we can enable JavaScript globally or chose to enable it on a site by site basis, just as you can with Java. A particularly useful feature is the **Disable window.open()** box. If you check this you can avoid the irritating pop-up windows that often appear – usually housing adverts – when browsing. The final tab, Plugins, simply lets you specify if you wish to enable plugins throughout *Konqueror*.

Another section of interest for configuring *Konqueror* as a web browser is the Enhanced Browsing icons which you can click on in the left bar of the window. This section primarily deals with Internet Keywords. An Internet Keyword is something you can type in to the location bar to save you typing in the full address. For example, if you type in **hb:cars**, the word 'cars' will be searched on hotbot.com. You can add, remove and modify Internet Keywords and can even specify

COOKIE MONSTER

One thing you should take notice of is the Cookies section. Here you'll find the 'Policies' and 'Management' tabs. The former allows you to decide if *Konqueror* should ask you about accepting cookies, while the latter lets you see a list of sites which have cookies on your machine. You can select the cookie, view its contents or delete it.



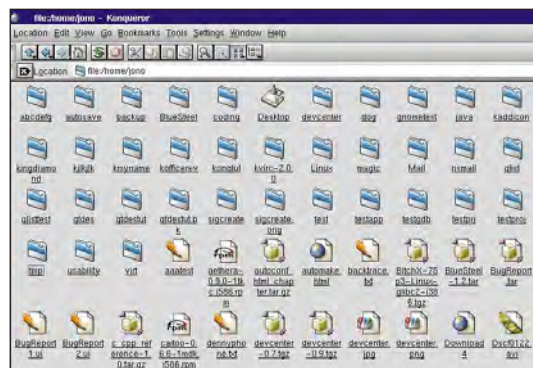
which search engine is used if you type anything that is not a correct web address or path in the location bar.

The last three sections are 'Proxies', 'Crypto' and 'User Agent'. Proxies provides configurations available for users behind a firewall, Crypto sets which cryptography features you want *Konqueror* to support (you should install OpenSSL and OpenSSH for suitable cryptography features), and User Agent supplies the websites you're browsing with information about your browser. When you are happy with your settings, click on **Apply** to accept them, then **OK**.

You are now ready to browse the web, and *Konqueror* provides a number of ways to make your experience as easy as possible. Bookmarks allow you to save a web address for easy retrieval. To add a bookmark, just select **Add Bookmark** from the Bookmarks menu. You can also create bookmark folders, which can be edited in the Bookmark Editor. At this point you can also customise how the *Konqueror* toolbar buttons look. In the screenshots above, you can see I have quite small toolbar buttons. I set these in the **KDE Control Center->Icons** to the size 16. You can also have text on the icons, by selecting an option in the Text Position part of the right click menu. As you can see *Konqueror* can be made to look any way you want it to.

FILE MANAGEMENT

So far we have only explored one side of *Konqueror*'s multiple functionality. As well as a web browser, it is also a powerful file manager. You will find *Konqueror*'s file management facilities very intuitive, particularly if you have used similar software on other systems and environments such as Microsoft's *Windows Explorer* or *Midnight Commander*.



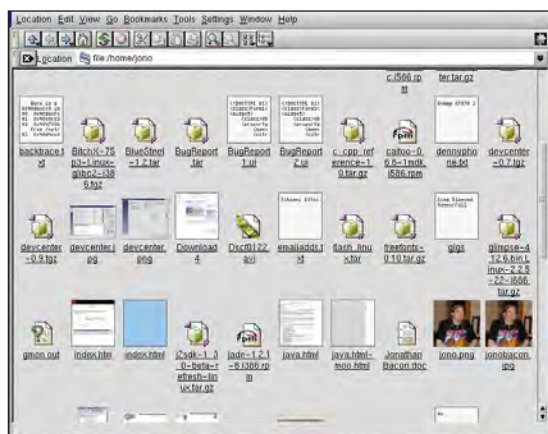
Konqueror can also turn its hand to file management.

The browser's toolbar is very customisable. Here we have buttons with just icons, or a combination of icons and text.

Have you got Java?

Many distributions include Java as a default component, and you can simply use the browse button to locate the 'java' executable. You are most likely to find it in the `/usr/bin` directory or somewhere similar. Check your distribution's documentation for more details. If you don't have Java, you can download it from <http://java.sun.com>.

TUTORIALS | konqueror



You can preview you files directly on the desktop.

/home/jono) with **file:**

Once you have accessed your files, you can now set up how *Konqueror* views them. The first thing to configure is how your files are displayed in the main pane of the window. There are essentially two types of view: an icon view and a text view. An icon view represents each file as an icon which also suggests what type of file it is. The text view represents the file as mainly text, although you can also have a small icon alongside it. These different types of view can be toggled with the two far right buttons on the toolbar. To complicate things, there are various selectable forms of icon and text view. These are chosen by clicking and holding the icon or text view button with the mouse. This launches a popup menu with which you can select which type of view you wish to use.

GETTING THE MOST FROM FILE MANAGEMENT

While you are browsing files in icon mode, there are a couple of nice features you can use to preview files. Previews are available for images, HTML files and text files (see boxout, below). To enable these previews is a simple job: all you need

→ Once *Konqueror* is loaded you can access your files in a variety of ways. The first and most common way is to click on the home icon on the toolbar to access your home directory. You should see something similar to screenshot at the bottom of page 79 (though with your files). You can see in the address bar file:/home/jono. This is another way to access files and directories. You simply prefix the path of the directory (eg.

to do is to select **View->Preview** and then the type of files you wish to see.

If you select **Settings->Configure Konqueror** you can configure *Konqueror's* file management mode just as you chose the web browsing options. The sections of interest will be File Manager and File Associations. We will now explore what options are available.

Looking first at the File Management section, we have three tabs available at the top of the window. The first tab selected is Behaviour, which offers a few simple options to define how *Konqueror* should behave when viewing and managing files. Here you can chose things such as opening directories in a separate window, and choosing a specific home URL. Moving onto Appearance, we can change how the file management mode looks in terms of font size and style and whether the text gets word wrapped. Under the Trash tab, you can choose how *Konqueror* should react when you delete a file. Take careful note of this section to avoid any unhappy moments when you accidentally delete a file. Selecting the final tab, Other, provides options for things like setting preferred programs to run (such as a terminal

program), and whether network options should be run in a single window.

The second section in the settings box, which is File Associations, does not just apply to *Konqueror* but to the whole of KDE. If you select the File Associations icon you will see a list box with the types of

files available. If for example you click on the image node, and then the JPEG node, you will see some options presented on the right. At the top of the options you can see the file extensions types that are covered by this node, a description of the file type, and the applications that are used to view files of that type. You can also add programs to support that file type with the Add button, and move the selected programs up and down the list. The reason why you move them up and down is that the top program in the list is the first loaded, and the others are loaded if the others can't be found. If you take a look at the top of the options on the right you can see the two tabs. Select the tab on the right labelled Embedding – and we can explore some options that are useful for viewing files. The options at the top let you select whether an embedded viewer or an external viewer is used for viewing the file when you click on it. If you want to view the file within the *Konqueror* window, select the Show File In Embedded Viewer option. You can also select which program is used for embedding the program.

When you are choosing which program can be used as an embedded viewer, you are best checking the program's documentation. Currently only KDE applications can be embedded, and then only a few of these support the feature.

MULTIPLE VIEWS

One of the most powerful uses of *Konqueror* is its support for multiple views. *Konqueror* gives you the ability to split the

**Under the Trash tab...
Take careful note of
this section to avoid
any unhappy deletions.**

PREVIEWING FILES

One thing to bear in mind however when considering previewing files is that directory with lots of files to previewed will take time to display as they need to be processed.

Other features that can be handy when using *Konqueror's* file management features can be easily access from the View menu. This menu deals with how you see your files, and you can also sort the files, toggle if hidden files are shown, switch between icon and text modes etc. The best thing to do is to have a play with the different views available.

Within whichever view you have chosen, you can manage your files with a variety of actions. You can for example click

on a file, and if the relevant viewer is available, the file will be viewable right within *Konqueror*. This works for many types of files including images, text files, web pages, KOffice documents, PDF files, video, postscript files etc. You can edit which type of viewer is used for the file types by looking at the File Associations module in the KDE Control Center.

Within *Konqueror* in both web browsing and file management modes, you always have a context sensitive menu available by pressing the right mouse button within the menu. This menu will give you options and access to help which are tuned to what you are doing at the time.

window into numerous panes in which each pane can act as a separate browser. For example, you could split a window into two views, and have one view as a web browser and one view as a file manager. This is very useful if you are browsing a website or FTP site and want to copy a file to your disk. As *Konqueror* supports drag and drop, you can select a file (from an FTP archive, say) and drag it onto another view within your browser (such as your home directory) and drop it. *Konqueror* then copies the file over.

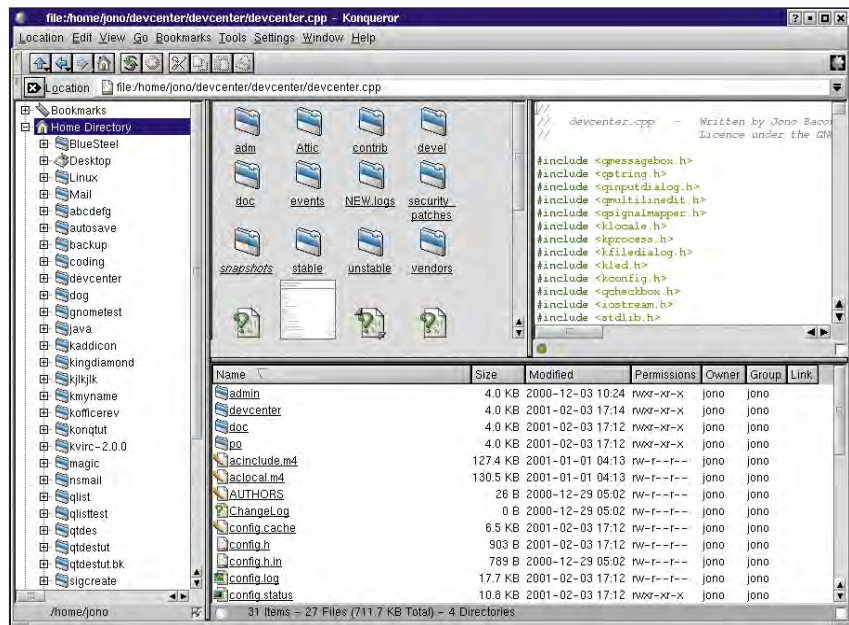
I find this feature one of the most useful within *Konqueror*, and a good example where it can help in software development is in viewing application as well as a coding reference. For instance, you could split the main window into two views – one which is looking at the HTML documentation on your hard disk (the documentation for Qt for example), and the other view can be looking at a directory. With this setup you could scan through the directory until you see a source code file you're interested in, and click on it to view it within *Konqueror*. If you then see a programming command you need to lookup in the reference, you just flick to the other view within the window to access it.

The process of adding a view is simple. All you need to do is to select one of the **Split View** or **Add View** options from the Window menu. The former will divide the currently selected view in two, while the latter will create a new window within the browser. This gives a vast number of possible configurations (See boxout, below).

OTHER USEFUL VIEW FEATURES

There are a few other useful features that can help creating your custom views and best using *Konqueror*. One of these features is the sidebar view. This can be enabled and disabled with the **Window->Show Sidebar**. The sidebar provides an extensive list of resources on your system all in one place for easy access. An ideal feature for users who are comfortable with either GUI or CLI is the Terminal Emulator view. This is simply a command line interface which can be added via **Window->Show Terminal Emulator**.

Once you have got the hang of views, you will no doubt discover your own favourite configurations, and these can be



The Sidebar provides easy access to all the resources on your computer.

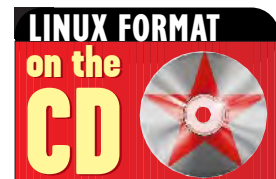
saved and loaded via **view profiles** in the Window menu. Here you can define and save a number of configurations for different tasks.

CONCLUSION

Konqueror is without doubt one of the most powerful applications for KDE and Linux. It is very extendible and easy to use, and its stability and versatility is impressive. Hopefully this article has given you an insight into some of the uses and configurations of *Konqueror*, and will lead you on to further exploration of this groundbreaking application.

From my experience working with KDE and developing KDE software, KDE developers like to implement much requested features as quickly as possible while retaining proper quality control. It is with these positive elements you can rely on *Konqueror* developing quickly – but smoothly – into a mature easy to use powerful browser; even more so than it is at present.

Keep your eyes peeled... the fun has just begun. **LXF**



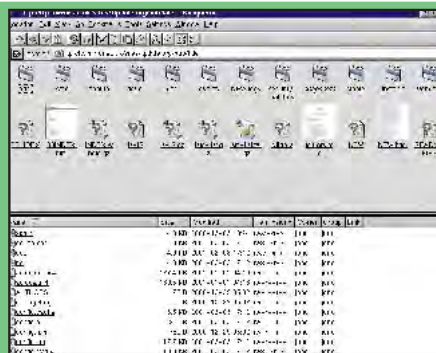
The latest version of KDE and Konqueror are on this month's Cover CD

KONQUEROR VIEWS

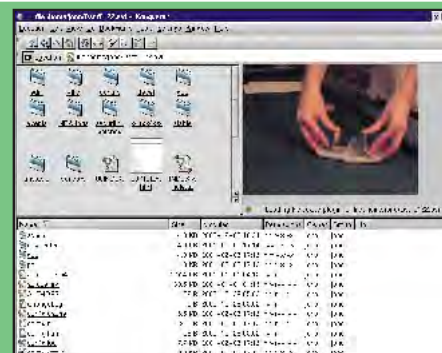
Here are a few of the ways in which *Konqueror* can present itself as a file manager.



Konqueror with two views. The top view is the Qt Reference Documentation on my hard disk, and the bottom view is my home directory.



The top view shows an FTP site (note how the previews work for everything), and the bottom view shows a directory in my home directory but using a text view instead of an icon view.



Here I have split the top view, and in the newly created window (on the right) I am viewing a video file which is on my disk. The bottom window still houses my home directory.

Being Objective

Charlie Stross continues his Perl odyssey with the first in a two part examination of object-orientation and Perl.



DIFFICULTY LEVEL

Stubble-faced
Geek

Object-oriented programming is not new; it's been around since the late 1960's, although it only really caught on in the mid to late 1980's, as a response to the increasing complexity of software. If you've written any program in any language that was more than a hundred lines long, you'll appreciate the need to wrap chunks of code up as separate subroutines. If you've written a program that was more than a thousand lines long, you'll probably have moved a bunch of utility subroutines out to a separate library file, so that they don't confuse the flow of control of the main program. But in really large projects, the proliferation of subroutines and data types that they work on rapidly becomes uncontrollable: which is where object orientation comes in. Object orientation is essentially a way of looking at software that allows us to fence off chunks of a project into "objects" (packages containing source code and the data structures the source code works on), with well-defined interfaces, so that we can concentrate on the big picture.

In its early days, Perl didn't do object orientation. If you were a masochist you could emulate it using namespaces, just as you can emulate object orientation in C (the Motif APIs require you to do just that!), but that was about the limit. Perl

5 introduced some new keywords and constructs that give Perl a very flexible model for doing object-oriented programming, and that's what we're going to take a look at this month.

WHAT IS OBJECT-ORIENTED PROGRAMMING?

Most programming work involves messing around with data structures – collections of variables linked in weird and wonderful ways. In object oriented design (and programming) we try to keep our data structures parceled together with the subroutines that create, modify, access, or destroy them. Access to a data structure is provided via some subroutines which are globally visible, but what happens to the internals of an object is a secret from the rest of the program, as is the internal structure of the object. There may also be some private subroutines that the rest of the software doesn't know about – these are used by the public routines, for their own purposes.

In general, object orientation relies on a handful of properties: information hiding (data is only visible inside the object's own code), inheritance (we can define a new type of

REFERENCES

A reference is what Perl uses instead of pointers. You haven't met pointers? Don't worry...

Computers organise data in their memory by putting each byte (or word) into a separate cell. Each of these cells has a unique numerical address, just like the position of an element in an array. Languages like C or Pascal let us refer to data we've stored in memory either by giving it a variable name, or by specifying the address of the memory cell it is stored at. Actually, all a variable name is, is a key in a special table of memory addresses called a symbol table: when you refer to a variable called Fred in Pascal or C, the compiler generates code that

checks the symbol table to find out the address where Fred's data is stored, then fetches it.

A pointer is simply a raw memory address. We can grab a pointer to the data associated with a variable, and stash it in another variable (or in part of a variable – say, inside an element of an array.)

Perl references aren't pointers to physical chunks of your computer's memory; they're merely an internal handle that the current Perl process uses to store or retrieve a bit of information. But they act like pointers. We can obtain a reference to a variable by prefixing the variable's name with a backslash, and store references in any scalar:

```
my @an_array = ("red ", "blue ",
"green ");
my $reference_to_an_array =
\@an_array;
```

`$my_reference_to_an_array` doesn't hold an actual array of data – it holds a reference which points to the chunk of memory where the array is stored.

If we print a reference, it doesn't show us anything useful:

```
print $reference_to_an_array;
ARRAY(0x80f8f28)
```

But we can dereference the contents of `$reference_to_an_array` (getting back to the original contents) by

prefixing the scalar containing the reference with the type it belongs to:

```
print @$reference_to_an_array;
red blue green
```

We can also use the `ref()` command to tell us what type of data is being referenced:

```
print
ref($reference_to_an_array);ARRAY
```

(Valid things that `ref()` can return include CODE, HASH, SCALAR, ARRAY. It returns undef (zero, false) if the object you're calling it on isn't a reference.)

COMPLEX DATA STRUCTURES

We can create data structures by storing references in arrays or hashes. For example:

```
my @colours = (qw(red blue green));
my @widgets = (qw(screw nail
staple));
my @colourful_widgets =
(\@colours, \@widgets);
```

This is cumbersome, so we can employ an anonymous array constructor. Instead of using brackets to create a list, we use square brackets to return a reference to an anonymous (unnamed) array. An anonymous array is just an array without a name – because we’ve saved a reference to it somewhere, it continues to exist and we can get at data stored in it. Like this:

```
my @colourful_widgets = ([ qw(red
blue green) ],
[ qw(screw nail staple) ] );
```

The array `@colourful_widgets` is not a two-dimensional array; it’s a one-dimensional array containing references to other arrays. But we

can use it in the same way as a two-dimensional array:

```
$color = $colourful_widgets->[0]-
>[1];
# $color contains “blue”
$thing = $colourful_widgets->[1]-
>[2];
# $thing contains “staple”
```

The arrows are inherited from C’s syntax for dereferencing pointers, and have pretty much the same meaning. Note that unlike C, they’re optional (when dealing with array subscripts), so we can refer to `$colourful_widgets[0][2]`, just as if it’s a true multidimensional array.

In addition to constructing anonymous arrays using `[...]`, we can build anonymous hashes using `{ ... }`. For example:

```
my $properties = { “food” =>
“cheese”,
“colour” => “blue”,
“smell” => “strong” };
```

Which is equivalent to:

```
%properties = ( “food” => “cheese”,
```

```
“colour” => “blue”,
“smell” => “strong” );
my $properties = \%properties;
```

A common use of anonymous hashes in Perl is to provide variables with multiple named fields – like records in Pascal or structs in C. To get the smell of our object:

```
print $properties->{smell};
```

In general, Perl lets us return a reference to most items – even subroutines. For example:

```
sub fred {
# do something
}
my $subref = \&fred();
```

Perl provides a powerful module for looking at complex data structures consisting of nested arrays and hashes linked by references: `Data::Dumper`.

You use it like this:

```
#!/usr/bin/perl
use Data::Dumper
```

```
# do something to create a
complex data structure pointed
to by a scalar called “$fred”
# now we want to inspect the
structure of whatever $fred
points to ...
print Dumper $fred;
```

which prints something like this:

```
$VAR1 = {
  'colour' => [
    'red',
    'blue',
    'green'
  ],
  'type' => [
    'screw',
    'nail',
    'staple'
  ]
};
```

Curly braces denote an anonymous hash; square brackets indicate an array. So what we have here is `$VAR1` (aka `$fred`), pointing to an anonymous hash with two keys, ‘colour’ and ‘type’. Each key has a value – reference to an array.

object, incorporating an existing one but adding new data and subroutines to access it), and modularity (information and subroutines related to a class of object are bundled together).

This month, and continuing next month, we’re going to take a look at a concrete example: a Perl module for editing the `/etc/hosts` file on a Linux system.

`/etc/hosts` is a file that matches hostnames to Internet addresses for computers on a network. DNS, the domain name system, replaced the hosts file for computers connected to the global Internet, because it’s a distributed database: a hosts file for the entire Internet would be gigantic and require very frequent updates. However, we still use `/etc/hosts` files for small office and home networks because it’s convenient and simple to set up. We might want to write a Perl script to read, update or modify an `/etc/hosts` file if we’re creating a system administration framework for any small local network.

Within `/etc/hosts`, we can write comments; they begin with a hash `#` symbol and continue to the end of the current line. We can also include a host record. A host record consists of an IP address, followed by a fully-qualified domain name for the host, then zero or more aliases (such as the hostname with no trailing domain information). Fields are separated by whitespace (spaces or tabs), and each record is terminated by a comment character or a newline.

Within our (hypothetical) system administration tool, we might want to hive off maintenance of `/etc/hosts` entries from

other functions (say, simultaneously updating entries in BIND’s database of hosts). Typical tasks include looking to see if a hostname has an IP address in the file, or if an IP address has an associated name: also, deleting a host, adding a new host, adding a new alias to a host, and changing the IP address of a host. We may also want to future-proof ourselves: IPv6 (the next version of the TCP/IP networking protocol) adds a new syntax for defining classes of networks.

It’s fairly clear that the core entity we’re going to work with, the object, corresponds to a file. We could pick different objects to work with – say, individual entries in an `/etc/hosts` file – but we’d still need an object corresponding to the hosts file, and its contents are simple enough that we don’t need to modularize it further. On the other hand, we don’t want to try to use a single class to update `/etc/hosts`, BIND configuration, SMB configuration, and so on in one place – that would be excessively complex.

We want to be able to create a new hosts object by reading in the `/etc/hosts` file and populating some sort of internal data structure with its contents. We want to be able to tell our object to update the version on disk (saving its contents). We want to be able to look up the names for an IP address, and vice versa. We want to be able to create a record for a given IP address, change its associated aliases, or delete it. Actually, this lot sounds like we *do* need another class, so we’re going to create one: a class of objects that consists of records in a hosts file. Our main program will never see ➔

SUBROUTINES AND PARAMETER PASSING

Like all serious programming languages, Perl lets us define subroutines (equivalent to C functions or Pascal functions). We do it like this:

```
sub my_subroutine {
# code goes here
return $some_return_value;
}
```

When we invoke `my_subroutine()`, `$some_return_value` is returned to the calling context. We can invoke it either by prefixing it's name with an ampersand (like `&my_subroutine`), or following it with brackets (C style). If you don't explicitly return a value from a subroutine, it returns the result of the last expression to be

evaluated within its scope. So:

```
sub return_true {
1;
}
```

always returns '1' (which is not false, by definition).

We can return more than one scalar value; in this case, whatever receives the returned values must be able to cope with a list, and identify whatever's been returned appropriately. If we try returning a hash, though, it will be 'flattened' into a list – and if we try returning a hash and an array, the results will be a messy collision. So if you want to omit complex structures from a subroutine, you could return a list of scalars containing references:

```
sub returns_complex_stuff {
# code goes here
return ( \%my_internal_hash,
\@some_array, $an_object);
}
# main program, now:
($my_returned_hash,
$my_array,
$my_object) =
returns_complex_stuff();
```

A similar rule applies to getting parameters into a subroutine. We can pass as many scalars as we like to a subroutine; but from the point of view of the subroutine, they all get squished into a special array, called `@_`. So if we want to push a mixture of different variables into a subroutine, it's best to pass them as references:

```
sub complex_sub {
$incoming_array = shift @_;
$incoming_object = shift @_;
# dosomething or other and
return
}$result =
complex_sub(\@array_to_process,
$object_ref);
```

Note that `shift` grabs the leftmost element of a defined array and returns it, shortening the array by a single element. Along with the corresponding commands `unshift` (shove an item onto the 'left' of an array), and `push/pop` (which operate on the other end of an array), we can easily implement stacks, queues, and a whole load of other very useful structures using ordinary arrays.

→ this class, but it'll make life easier inside the main class. So what we're going to do is this:

- Write a class (let's call it `LF::Hosts`) that gives us a set of data structures and subroutines for messing around with an `/etc/hosts` file.
- Write a class (called `LF::Hosts::Entry`), to be used by `LF::Hosts`, that gives us data structures and subroutines for creating/querying/editing/deleting a host record.

Our main program will then say something like this:

```
my $hosts = new LF::Hosts or die "Could not
open /etc/hosts file: $!\n!";
# get names associated with an IP address
my @aliases = $hosts->identify("192.168.1.10");
# and vice versa
my $ip_addr = $hosts->identify("mike.linuxformat.
org");
# print comments associated with host $ip_addr
print $hosts->comments($ip_addr);
# print comments associated with no particular
# host
print $hosts->comments();
# insert a new host
$hosts->add("192.168.1.14", "bob.linuxformat.org",
"bob");
# modify (rename) an existing host from "bob" to
"patricia"
$hosts->edit("192.168.1.14", { "bob" =>"patricia",
"bob.linuxformat.org" => "patricia.linuxformat.org"
});
# delete a host
$hosts->delete("192.168.1.100");
# finally, save the file
$hosts->commit();
```

CREATING PERL OBJECTS

In Perl, a class of objects is defined by a package (that is, a set of Perl subroutines that come with their own namespace, usually in a separate file). All data associated with the class is stored in the class's namespace, or in data structures hanging off a reference.

We usually put packages in separate files (with the suffix `.pm`); when our program needs to use a class, we add the **use** **Classname** directive to tell Perl to load the appropriate package while it compiles the program. For example:

```
use MyPackage;
```

Tells Perl that it should locate the file containing `MyPackage` (i.e., a file called `MyPackage.pm`, in one of the directories listed in the special array `@INC`) and compile it.

(Note that **use** is executed at startup, before the script begins to run; the similar **require** directive, a hangover from Perl 4, is executed whenever the Perl script flow of control gets around to executing that line.)

Unlike a normal data structure (such as an anonymous hash), an object knows what class it belongs to: instead of being a `HASHREF` or an `ARRAYREF`, it belongs to `LF::Hosts`, or `LF::Hosts::Entry`, or something. We tell an object what class (package) it belongs to using the **bless()** command. For example:

```
bless $variable, Fred;
```

This line tells **\$variable** that it is a Fred (whatever a Fred happens to be).

A side-effect of blessing a variable, so that it belongs to a specific package like `Fred`, is that if we then call a subroutine ('method' in object-oriented jargon) called **do_something()** on the blessed variable, it will look first for a subroutine in its

own class, called **&Fred::do_something()**. If no such method exists, it looks for other classes listed in a special array called **@ISA** (literally, “is a”) before seeing if there’s a standard subroutine of that name.

We use a special shorthand for calling methods (subroutines associated with an object):

\$thing->do_something()

Means ‘run the subroutine **do_something()**, from whatever package **\$thing** belongs to, passing it **\$thing** as its first parameter.’

In general, a class contains two types of method (subroutine): class methods and instance methods. A class method is one that operates on all objects defined as belonging to the class – for example, we might use one to tell our **LF::Hosts** class that our systems all put the file **/etc/hosts** somewhere unusual. An instance method is one that operates on a single object: for example, to get or set its internal state.

We almost always need one specific type of instance method called a constructor. A constructor is called like a class method (i.e., by name, rather than by dereferencing an existing object), and it returns a reference to a new object. By convention, Perl classes usually call their constructors ‘new’.

In the case of **LF::Hosts**, calling ‘new’ should return a reference to a data structure that embodies an **/etc/hosts** file, which has been blessed so that it ‘knows’ it is a member of the **LF::Hosts** class (and ‘knows’ what subroutines apply to it). In the case of **LF::Hosts::Entry**, calling ‘new’ should return a reference to the next entry in the parent object’s hosts file.

Like this:


```
package LF::Hosts;
$LF::Hosts::HOSTFILE = "/etc/hosts";
sub new {
    my $self = {};
    # create a reference to an empty hash
```

```
    bless $self, $LF::Hosts;
    # tell $self that it is an LF::Hosts object
    # Now we open the hostsfile, and generate a bunch
    # of LF::Hosts::Entry objects, each of which is added
    # to $self as a hash key/value pair
    open (FH, "<$LF::Hosts::HOSTFILE") or die: "$!\n";
    while (! eof(FH) ) {
        my @line = LF::Hosts::Entry->new(FH);
        if ($line[0] eq "COMMENT") {
            push(@{$self->{COMMENT}}, $line[1]);
        } else {
            $self->{$line[0]} = $line[1];
        }
    }
    close FH;
    return $self;
}
```

This is the constructor method for **LF::Hosts**; it returns a reference (called **\$self**) to a blessed object, which is actually an **LF::Hosts** object. The object is a hashref containing various key/value pairs; each value is a reference (pointing to either an array of comment lines, or to an **LF::Hosts::Entry** object).

A point to note: **LF::Hosts::Entry**’s **new()** method returns an anonymous array containing two items: a key and an **LF::Hosts::Entry** object. The key is either the string **COMMENT**, or an incrementing number (stored in a class variable maintained by **LF::Hosts::Entry**) that is unique for each instance. The line:

```
push(@{$self->{COMMENT}}, $line[1]);
```

shows that we can push (append to an array) a variable (the object referenced by **\$line[1]**) into an anonymous array that hangs off an object. **\$self->{COMMENT}** is an array reference and we use **@{ \$self->{comment} }** to tell Perl to treat it as one. 

NEXT MONTH

Next month, we’ll see how the instance methods are written, write a child class (**LF::Hosts::Entry**), see how Perl’s POD documentation system works, and discuss some of the more interesting applications of Object Orientation in Perl.

VARIABLE SCOPE

In Perl, there are three mechanisms for defining the scope of a variable. First, there’s the namespace. If you refer to a variable like **\$thing**, it instantaneously springs into existence – within the current namespace. If you haven’t used a **/package/** command to specify a different package – each package comes with its own namespace – this will be the namespace **main**; so your variable will actually be **\$main::thing**.

A variable created in this way is global, which is a nuisance; if you want something called **\$thing** to be local to a subroutine, don’t just use it this way.

Tip: you can make Perl throw a runtime error when you do this by

using the **use strict** compiler pragma: put a line like:

```
use strict;
```

at the top of your script, and Perl will refuse to run it unless all variables are explicitly declared within a namespace, or are lexical (see below).

You can locally override a global variable by using the **local** command. For example, if our script has a **\$thing** floating around, we can add the line:

```
sub mysub { local $thing;
```

Thereafter, within the subroutine **mysub()** **\$thing** is treated as an

entirely different variable; the global version is rendered invisible. But when we leave the scope of **mysub()**, the global version of **\$thing** reappears, and the copy inside the subroutine vanishes mysteriously. This is because the command **local** causes Perl to stash the designated variable on a stack, and restore the old value of it upon leaving the enclosing block of code.

Local scope is sometimes handy, but what you probably want are true local variables, the way a language like C or Pascal provides them. To declare a lexically scoped variable – one that exists only within the scope of the lexical block of code enclosing the declaration, use **my**:

```
sub mysub {
    my $thing = shift @_;
    # and so on
}
```

The lexically scoped **\$thing** doesn’t exist within a symbol table; it’s stored somewhere else entirely. It’s invisible outside of **mysub()**, unless you obtain a reference to it and return the reference (in which case you can do neat things with it). This gives us true control over variable scope, like a real grown-up language. And in general, unless you want your variables to be global, you should remember to use **strict** and always declare your variables lexically – and initialise them to a sensible value!

WINDOW MAKER

Chris Howells leaves the KDE and GNOME desktops behind to discover Window Maker, a window manager with a long, stylish heritage...



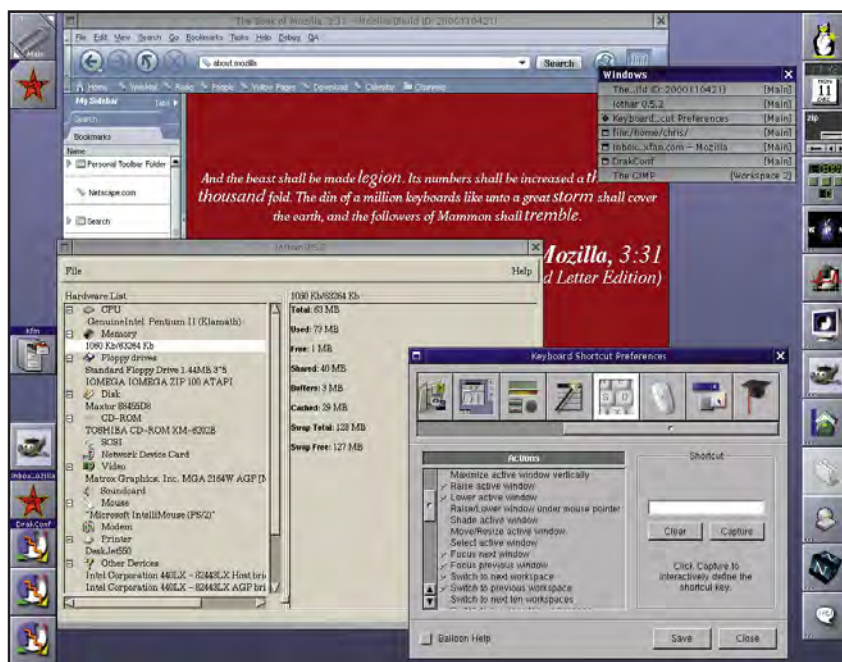
For the end user, one of the best things about Linux is choice. Unlike Windows where you are tied down to the way Microsoft thinks you should do something, Linux provides many alternatives in just about every software genre. This includes the command line shell, file manager, and the window manager that you use under the X Window System. Unfortunately though, with distributions such as Red Hat pushing *GNOME*, and Mandrake and Caldera pushing *KDE*, you may not have realised that alternatives actually exist.

THE X WINDOW SYSTEM

As you have probably already realised, the Linux command line is extremely powerful – and working in text only mode is particularly useful feature on lower end hardware. However virtually all versions of UNIX (including Linux) can use an implementation of the X Window System to provide a GUI (Graphical User Interface) on top of the plain text only command line interface. The most common implementation under Linux is XFree86.

The X Window System is special because of its modularity – unlike Windows where you have little choice apart from the standard Explorer shell. The X Window System sits on top of the Linux kernel, and has drivers which allow it to talk to your graphic hardware. But the X Window System on its own isn't particularly useful.

A Window Maker desktop in all its glory.



However, combined with a window manager, you can do things like manage the open windows on a desktop, and create buttons to press – all of which are taken for granted now. Other window managers you may have heard of include *kwm* (the *KDE* window manager, which is not much good without the rest of the suite), *Enlightenment*, *FVWM*, and *Sawfish*, all of which can run of their own accord.

WHY WINDOW MAKER?

You may be wondering why there is so much choice in Linux, and what the benefits of running *Window Maker* over complete desktop suites like *KDE* or *GNOME* (strictly speaking these are not window managers in their own right). *KDE* and *GNOME* were very much designed to be easy to use, and also perhaps to make Windows users feel at home. Unfortunately one of the drawbacks of this is that they now require reasonable quantities of hard disk space, processor power, and RAM to run properly. Suffice to say, not everybody's hardware fulfils these requirements, so something more lightweight like *Window Maker* may fit your needs better. Naturally, if you have very fast hardware, *Window Maker* will run at light-speed. Additionally, *Window Maker* is so different from *KDE* and *GNOME* that it makes a nice alternative.

Window Maker is in fact not restricted to only working under Linux – Linux is sufficiently similar to other flavours of UNIX to make porting software easy. Therefore, you should not have any problems running *Window Maker* under other types of UNIX such as Solaris, IRIX and BSD.

THE HERITAGE AND HISTORY OF WINDOW MAKER

After helping to co-found Apple Computer Inc. in 1976, Steve Jobs left and formed another company called NeXT Inc. NeXT created a UNIX-like operating system with a special GUI, and named it *NeXTSTEP*. Eventually in 1996 Apple purchased NeXT, and Jobs was persuaded to join Apple again, where he remains to this day. Incidentally, NeXT's UNIX-like operating system may have been the inspiration for Apple's upcoming new UNIX based operating system called OS X. That's another story however...

Several years ago, the *AfterStep* project began, with the aim to build a UNIX window manager that closely resembled *NeXTSTEP*. The *AfterStep* project continues to this day, but one of the programmers working on the project, Alfredo Kojima, decided to leave and create a different *NeXTSTEP* like window manager. This eventually became *Window Maker*.

Today, many developers work directly on the project, and many others have submitted bug fixes. Window Maker is built upon the WINGS GUI toolkit. Although something more common such as GTK+ could have been used, it was decided to use WINGS since it resembles *NeXTSTEP* more closely.

HAVE YOU GOT WINDOW MAKER?

Window Maker is quite a popular window manager, and is supplied with most distributions – this includes Red Hat, Mandrake, and Debian. If you are running an old version of a distribution you may also be running an old version of *Window Maker* – version 0.62.1 is, at the time of writing, the current version. With an RPM based distribution (including Red Hat, Mandrake, Definite, SuSE and Caldera) you can check whether it is installed by querying the rpm package manager. Enter the following command:

```
rpm -qa | grep -i maker
```

In this command, **rpm -qa** outputs a list of all installed packages, and pipes it into **grep**, ignoring the case and searching for the string 'wmaker' in the output. If it is installed, you will receive something like this:

```
WindowMaker-0.61.1-16mdk
wmakerconf-2.4-2mdk
```

As this is an old version, we'll remove it and compile the latest (0.62.1). Even if you already have the latest version, you may wish to remove it and re-compile yourself in order to customise it specifically to your needs. If you don't already have *Window Maker* installed, and you are not brave enough to compile from the source code, you should be able to install it from your distribution's installation disk, or download a binary version from [ftp://ftp.windowmaker.org](http://ftp.windowmaker.org)

COMPILING AND INSTALLING WINDOW MAKER

If you already have *Window Maker* installed, you can remove it with a command similar to the following (based on the output of the rpm query above).

```
rpm -e wmakerconf-2.4-2mdk
rpm -e WindowMaker-0.61.1-16mdk
```

If there is an error message stating that there is a dependency that will be broken, you can force the removal by adding the **-nodeps** option. This shouldn't cause any problems, as we'll soon have *Window Maker* running again.

Window Maker is also dependent on the LibPropList library, which needs to be installed before starting work on compiling the application itself. It can be downloaded from [ftp://ftp.gnome.org/pub/libPropList](http://ftp.gnome.org/pub/libPropList) if you don't already have it. You can check whether you already have it installed by running the command **rpm -qa | grep -i PropList**. If you wish to upgrade to a later version, simply use the **rpm -e** command to remove it, and then use the following instructions to compile the new version:

```
tar xvfz libPropList-0.10.1.tar.gz
cd libPropList-0.10.1
./configure
make
su -c "make install"
```

We can now start compiling *Window Maker* from scratch. Head over to [ftp://ftp.windowmaker.org/pub/release/srcs/current/](http://ftp.windowmaker.org/pub/release/srcs/current/) to find and download the latest version.

Once you have downloaded this to your system, you will need to execute a different command based upon whether you downloaded the tar.gz or tar.bz2 version – ultimately they both contain the same files, although bzip2 is a more modern compression technique, so archives will be slightly smaller.

For tar.gz: **tar zxvf WindowMaker-0.62.1.tar.gz**

For tar.bz2: **bunzip2 -c WindowMaker-0.62.1.tar.bz2 | tar xvf -**

Then enter the directory and start compiling:

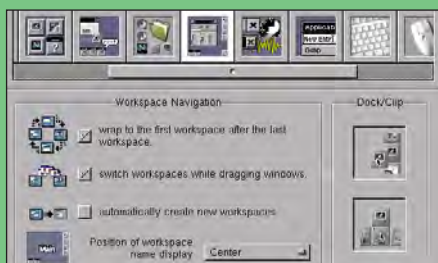
```
cd WindowMaker-0.62.1
./configure --prefix=/usr/local/wmaker-0.62.1
make
su -c "make install"
su -c "ldconfig"
```

The Clip

The *Window Maker* clip has several functions. If you have enabled multiple desktops through the *Wprefs.App* utility, you can use the clip to switch between the various virtual desktops that are available. This is achieved quite simply by clicking the arrows. Additionally, if the dock becomes too full, the clip can hold extra appicons and dockapps. Anchoring an appicon onto the clip is achieved in much the same way as anchoring an appicon to the dock.

WPREFS.APP

With *Wprefs.App* you can control many of *Window Maker*'s features – here we'll look at some of the more interesting pages of the applet.



You can choose to configure virtual desktops, how the virtual desktops function, and details about the dock and clip.



This is where you configure how *Window Maker* looks, such as animation speed and the title bar widgets.



You can also select the colour scheme used in certain parts of *Window Maker* such as focused and unfocused windows.

TUTORIALS | window maker

CRYSTAL CLEAR



Some of the various names for certain parts of *Window Maker* can get quite confusing, so use these guides to help you physically locate parts of the desktop on your screen.



The clip can hold anchored appicons and dockapps, and switch between virtual desktops.



Appicons appear to represent running and minimised applications.

The dock (left) holds appicons and dockapps. Three dots indicate that the programme isn't running.

➔ Finally, run the 'wmakerinst' script to set up *Window Maker*, so that you can run it under your normal user account.

Congratulations! Your new window manager should now be installed, and if you default to a text login, you can run it using **startx**. Alternatively you can configure your graphical login manager (such as gdm or kdm) to load it.

THE MENU

The menu obtained by right clicking anywhere on the desktop provides access to a list of some lesser used programs that you can add to the menu, as an alternative to anchoring their icon on the dock or clip. Additionally, it is also possible to access some of *Window Maker's* configuration functions from the menu.

The *Window Maker* configuration files can be found in your home directory, under the directory ~/GNUstep, so if you wish, you can get your hands dirty and manually edit them. Depending on the menu format that you use, it might also be possible to edit the menu using the WPrefs.App configuration utility. The system automatically rereads the menu setup every few seconds, so you should not need to restart or recycle *Window Maker* to see your modifications reflected on the desktop. Additionally, parts of the menu can be detached, by dragging their title bar, to keep them permanently open.

Another useful menu is obtained by clicking the middle mouse button anywhere on the desktop. Doing this will bring up a list of every open window (on all desktops) making it easy to switch between programs, even if they happen to be hidden away on a different virtual desktop from the one that you are currently using. If you're labouring without a third button on your rodent, you may be able to emulate the third-button click by simultaneously clicking the left and right buttons; if this fails you'll probably need to configure XFree86 to support the feature.



The mighty Mozilla, reduced to a tiny WM icon.

THE DOCK

The dock is one of the key features of *Window Maker*, and resembles the wharf in the *AfterStep* window manager. The dock is normally started at the same time as the desktop and, amongst other things, provides the capability to hold application icons (appicons) and dockable applets (dockapps) – more on those later. The purpose of the anchored appicons is to enable easy double click access to starting a program – much like the icons on a *GNOME* or *KDE* desktop.

When a program is run, an icon is produced to show that the program is running. Generally, this is along the bottom of the screen, although with the WPrefs.App configuration utility it is possible to arrange for the appicons to be aligned vertically. In order to anchor an icon to the dock, it is necessary to drag the icon towards the dock and wait until a white square becomes highlighted – you can then let the mouse button go and the icon will be left clinging to the dock. When this has been successfully completed, and the application is not running, three dots should be shown in the lower left hand corner of the icon. This simply informs you that the application is not currently running.

Due to a programming flaw in the way that a few applications are written, some of them may not produce an appicon which can be anchored. In this instance, you should run the program, and right click on the title bar and choose the "Attributes..." list from the drop down list. Then choose the "Advanced Options" setup screen, and ensure the option "Emulate Application Icon" is checked. Save and Apply the dialog, and then the next time you run the application, a mini appicon should be produced which can be docked.

When an appicon is in placed on the dock, it is possible to configure various aspects of the programs execution by right clicking on the icon, and choosing the required option from the drop down menu. For example, the "Settings..." dialog box will allow you to change the command that is executed, and the icon that is displayed.

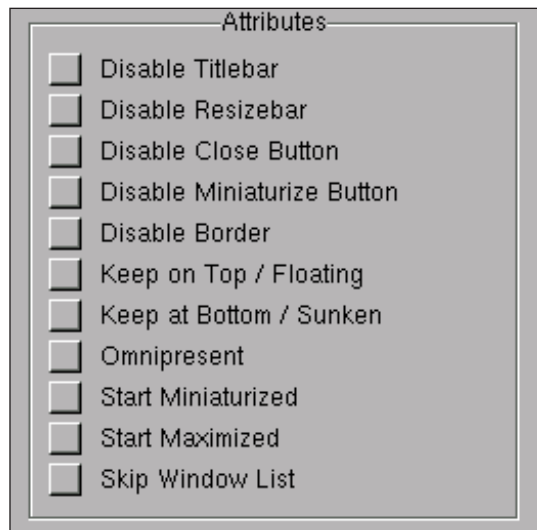
WPREFS.APP

WPrefs.App is the uninspiring name of the *Window Maker* configuration utility. You should certainly have this on your system – it is very powerful and allows easy access to virtually any area of *Window Maker* that may need configuring. Thankfully, WPrefs.App is included in the main *Window Maker* source package, so if you compile from source yourself, you should already have it somewhere on your system. Have a look at the WPrefs.App boxout for further information about how it works.

Keybindings (keyboard shortcuts) can also be configured within WPrefs.App, which should be particularly valuable to people that can touch type, or just loath reaching for the mouse to do the simplest actions.

DOCKABLE APPLETS

Dockapps are a rather incredible feature of *Window Maker*. Anchored to the dock or clip in much the same way as appicons, dockapps are in fact mini applications that are written for *Window Maker* (and occasionally *AfterStep* as well)



This is where you set the various attributes available for Window Maker's windows.

in order to complete a special task. A great many of these exist, in a variety of diverse areas. For example, the standard *Asclock* dockapp is probably one of the most popular *Window Maker* dockapps that exists – as the name suggest, *Asclock* is a dockapp that simply displays the current time and date. Monitors are another popular genre of dockapp. For example, dockapps exist that display the processor usage, monitor the use of the disk partitions, and even traffic flowing through eth0 (your system's network interface), so at a quick glance, you can easily see how your system is running.

Multimedia is also covered by dockapps. Various CD players exist in various forms (such as *WMrack*), and utilities for setting the system's audio/mixer level. *WMTv* is a dockapp that has a miniature representation of a TV screen, for machines that feature a television card based on the Bttv (Video4Linux) chipset (including most popular models such as Miro and Hauppauge).

If you compiled *Window Maker* from source as described above, then you may wish to obtain *Asclock* (<http://www.asclock.org>), which is provided separately from the main *Window Maker* code bundle.

Compile it with the following commands:

```
tar xvfz asclock.tar.gz
./configure
make
su -c "make install"
```

Once you have finished compiling *Asclock*, start it from an Xterm using the following command **asclock -shape**. You can then drag the *Asclock* appicon which has appeared and put it into your preferred position on the dock or clip. It's also a good idea to edit several dockapp options before continuing. Right click on a blank area of *Asclock*, and choose "Settings...". Then ensure that the options "Start when WindowMaker is started" and "Lock (prevent accidental removal)" are checked – this will ensure that *Asclock* is started at the same time as *Window Maker* so that you do not just see its place holder, and also ensure that it cannot be

removed with a careless mouse movement. Visit the main Window Maker website for more about the various dockapps available for the desktop.

THEMES

While the theme-ability of *Window Maker* is not quite as intense as that of an alternative window manager such as *Enlightenment*, it does provide the capability to customise the background image or colour, and the colours or gradients used for details such as menus and title bars.

Probably one of the best known sources of themes for *Window Maker* is from <http://wm.themes.org>. The installation varies slightly for most themes, however when you download a theme, simply untar it with the familiar **tar xvzf <filename.tar.gz>**, and follow the instructions within. Another source of themes and icons is the *Window Maker* extras package which is available from windowmaker.org – we'll take a look at how to install it on your system:

```
tar xvzf WindowMaker-extra-0.1.tar.gz
./configure
su -c "make install"
```


To change the theme simply right click on the desktop, choose "Appearance", then "Themes", and choose the desired theme from the drop down list. Additionally, you can choose from a list of "Styles" which are similar to themes.

THE FUTURE OF WINDOW MAKER

Over the last few years since the development of *Window Maker* began, the environment has gained a large following in the Linux community. This includes people who simply want an alternative window manager and appreciate the simplicity and elegance of *Window Maker*, and perhaps users who have experienced the real *NeXTSTEP* desktop, and want to continue using something similar.

Gradually, *Window Maker* is becoming more compliant with the *GNOME* standard, so it is possible to use it as a fully-fledged alternative to *Sawfish* or *Enlightenment*. This will help bridge the gap for those that like *GNOME* in general, but also appreciate the finer qualities of *Window Maker*.

Version 0.62.1 has been around, unchanged, for quite a while. However, according to the lead developers such as Alfredo Kojima and Dan Pascu, significant development has gone on during this time. If you want to experience this for yourself, you may choose to run the cutting-edge CVS version.

Even though *Window Maker* is "only" version 0.62.1, it is already very stable and usable. Obviously we won't tell you that you should use *Window Maker* over any of its rivals – it's quite simply a matter of taste. 

Glossary

KDE – The K Desktop Environment, a project started in 1996 to provide a unified desktop for UNIX, including a file manager and other details.

GNOME – The GNU Object Model Environment, a rival to KDE that was started out of concerns that the license for Qt, the GUI toolkit that KDE is based upon, was not open enough at the time.

X Window System – Also known as X, the system that provides facilities for displaying graphics on top of UNIX.

Window Manager – A program that runs under X and allows widgets, windows and icons to be drawn on the screen.

Solaris – Sun Microsystems's commercial version of UNIX, which runs on both Intel/AMD processors and Sun's own SPARC hardware.

LINKS

Naturally, *Window Maker* has quite a large following on the Internet and World Wide Web. Here is a selection of some of the best resources available:

IRC: Connect to server 'irc.linux.com' and join channel #windowmaker (and check out Linux Format's own channel, #linuxformat while you are there as well!).
<http://www.windowmaker.org> – The main source of Window Maker information on the web, with many links to other sites, and links to the mailing lists.
<http://wm.linuxpowered.com> – A good general information site.
<http://wm.current.nu> – Another good general site.
<http://www.bensinclair.com/dockapp> – A superb dockapp resource base.
<http://wm.themes.org> – A great themes database.

What on Earth is JABBER?

If you're currently running three, four or even five instant messaging systems, **Jon Kent** thinks he's got the answer to your IM prayers.

Jabber is capable of delivering any kind of data instantly, not just simple text messages.

One of the most popular applications used on the Internet is Instant Messaging or Internet chat systems such as Yahoo! Messenger or AOL Instant Messenger (AIM). These systems allow you to communicate in real-time with a friend or colleague via some form of proprietary application which uses a proprietary protocol. Needless to say, these systems cannot communicate with each other, and many are not officially available to run under GNU/Linux. *Jabber* was initially conceived because of these drawbacks by a hacker (in the positive sense) called Jeremie Miller back in 1998. However, as you will see, *Jabber* is not limited to being a chat system, but can be used for any purpose that requires real-time messaging.

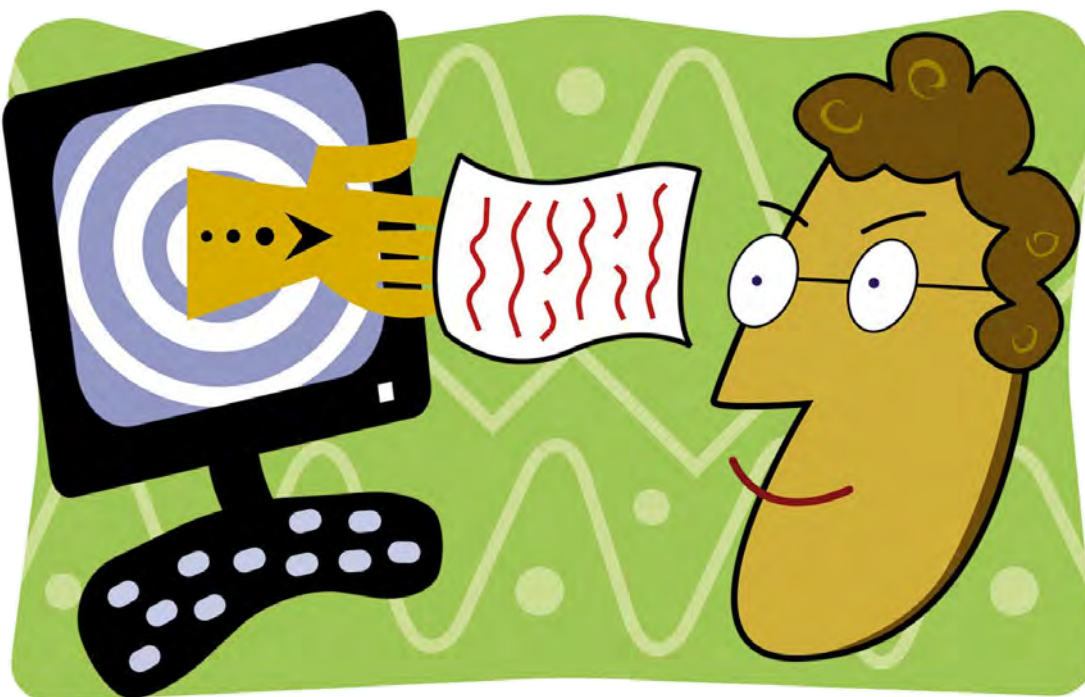
WHAT IS JABBER?

Jabber is an open source instant messaging (IM) and presence system which works in real-time. Presently the most

common use for IM systems is for Internet chat (IC) applications such as Yahoo! Messenger. So *Jabber's* first use has been to provide IM to the various IC client applications that have been written. Currently there are several *Jabber* IC client applications available for a wide selection of platforms. Under GNU/Linux the most popular *Jabber* IC client is current *Gabber* which is a GTK based (GNOME) application and under Windows *WinJab* is the current favourite. However *Jabber* is not just an IM system and differentiates itself from the proprietary IM solutions mentioned by implementing the following features:

- Client server architecture
- XML foundation
- Distributed
- Open protocol
- Provides a modular and extensible architecture

The client server architecture provides the usual benefits, with the client initiating that data conversation (using XML data streams) with the server and the server doing all the major work on behalf of the client. To summarise the server would locate the destination server that the message is to be forwarded to and pass the message to that server, either directly or indirectly. If there is a response, the server will forward this onto the client, and so on. An additional advantage to this model is that modification and/or additional modules can be written and added very quickly to the server, as the client application does not worry about how a message is sent. Only the server needs to know how to communicate with another server or IM system. So should AOL modify AIM, the *Jabber* server just needs to be



modified to reflect these changes.

Because *Jabber* is built using XML it is extensible and therefore able to express any kind of structured data that is required. The use of XML therefore allows *Jabber* to be used to transport any type of message, either textual, command based or raw data. The receiving client application only has to understand *Jabber's* XML data scheme. This opens the system up to uses outside of standard chat based messaging

Jabber's overall architecture can be viewed as similar to the Internet email system, i.e. highly distributable. Any number of servers can exist, each of which are accepting connections from clients, in addition to communicating to each other. Each *Jabber* server is completely independent and is in charge of maintaining its own user list.

Lastly, because *Jabber* is a fully open source project, anyone can write a client application that uses the *Jabber* architecture. It is worth noting that any application that uses *Jabber* should be considered a client application, whether or not it is intended respond to a *Jabber* message.

SO JABBER CAN TALK TO OTHER INSTANT MESSAGING SYSTEMS?

This is where the power of *Jabber* shows. Because of its architectural design, *Jabber* can be configured to communicate with IC systems that use a different protocol mechanism by using 'transports'. These transports allow communication to and from these foreign IC system via the *Jabber* server. How this actually works is covered later, but for the moment let just confirm that *Jabber* can currently communicate with the following IC systems:

- AOL Instant Messenger (AIM)
- ICQ (I seek you)
- Internet Relay Chat (IRC)
- MSN Messenger
- Rich Site Summary (RSS)
- Yahoo! Messenger

So if your friend uses AIM, you can communicate with him or her through a *Jabber* IC client. This removes the common problem with IC systems in that normally you would need to have a client for each IC system running as they cannot cross communicate. So, normally, you can only use Yahoo! Messenger to chat to other Yahoo! users. This removes choice as you are forced into using an exclusive IC client. *Jabber* IC clients remove



this restriction and give you back your power of choice, after all this is what open source is all about: choice not restrictions.

Much like other messenger systems, each user needs to have a unique ID for *Jabber* to use as an identifier. With *Jabber* these IDs are formatted much like an email address such as "fredblogs@jabber.com". The section before the @ is the user ID and the second section is the server that they're currently using, in this case jabber.com.

WHAT IS JABBER'S ARCHITECTURE?

There are four basic components that form the core of the *Jabber* architecture: *Jabber* clients, servers, Transports and Etherx "Router".

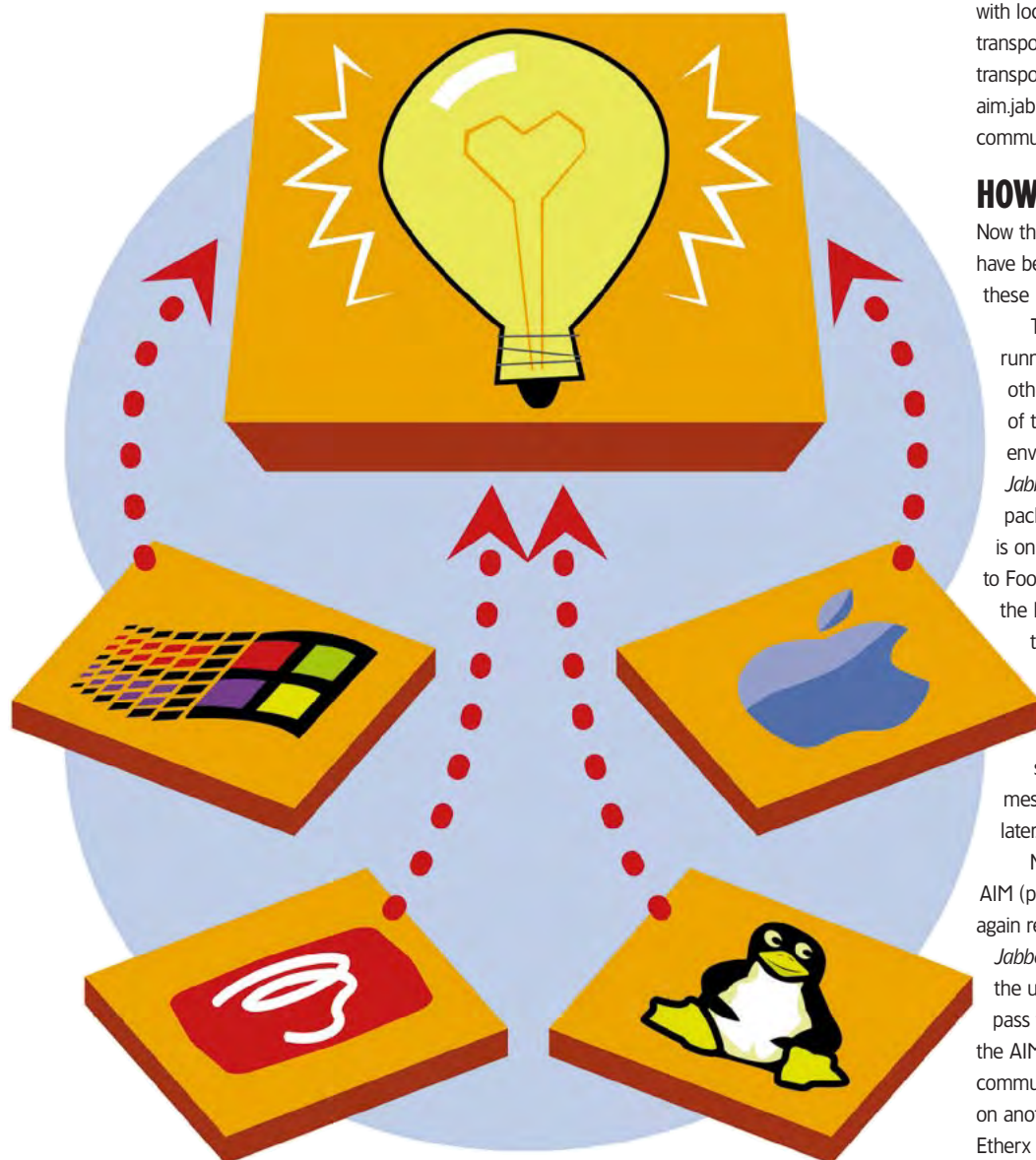
Jabber clients are the most lightweight of the four components of the architecture. A *Jabber* client connects directly to a server (via a TCP socket connection) and communicates via XML. The *Jabber* client does not usually communicate beyond the server it has connected to. As highlighted previously, the client hands most of the workload to the server, allowing the client to merely manage the connection to the server and send and receive any messages as required.

As we mentioned earlier, *Jabber* works in a standard client-server mode. The heart of *Jabber* is the server (currently at version 1.2). This performs many functions, such as session

Overview of XML

XML (eXtensible Markup Language) is the same as HTML in as much as they are both markup languages, but that is where the similarity stops. HTML describes how the content should be laid out and is not concerned about the actual data that is displayed. Conversely, XML only cares about the data and not about its display. With XML you are not restricted to the tags that can be used, unlike HTML. XML tags that surround the item of data can be called whatever you want, and are there to describe the data content only. However, you need to define the tags that you have used, to describe the type of data the tag is representing and so on. In other words XML can be described as a mechanism to deliver self-describing data.

Obviously, there is a great deal more to XML than this brief description. Refer to the web resources section at the end of this article for sites you may wish to visit to find out more about XML.



Regardless of your chosen OS, you'll probably find a Jabber client for you.

→ management, user authentication, message filtering and group chat to name a few. The Jabber Session Manager (JSM) of the server is the heart of the messaging system. The JSM verifies the destination of the message and forwards the message to the server-to-server (s2s) component of the destination hosts. The s2s within this host will then direct the message to the appropriate Jabber server or to a transport for a third party IC system (such as AIM).

Jabber Transports can effectively be seen as translators between a foreign IM system and Jabber. The Transports allow users to log onto another IM system (i.e. AIM), and send and receive messages from that system via Jabber. The Transports transform messages and packets from the foreign IM system to legal XML packets and vice versa. Transports do not communicate directly to the Jabber client application but via the Etherx component.

The Etherx is implemented as a shared library and provides the communication layer that the Jabber servers and transports use to communicate with each other. The Etherx communicates

with local and remote Jabber servers as required and to local transports. The Etherx only needs to communicate with local transports as these are tied to a dedicated server (i.e. aim.jabber.com would be the server dedicated to communicating with AIM clients).

HOW DOES IT ALL WORK THEN?

Now that the basics of the Jabber architecture and components have been covered, let's look at a few examples to put all of these pieces together.

The simplest example is when there are two users, both running a Jabber client, that want to pass messages to each other. As both of these users are on the same system, the life of the communication is self contained with the Jabber environment. So, when Fred sends a messages to Foo, the Jabber server that Fred is connected to will receive the XML packet and examine the destination for the message. If Foo is on the same server, the message will be forwarded straight to Foo by the server. If he's not, the message is passed on to the Etherx for further processing and is then redirected to the Etherx on the host server that Foo's address relates to. The Etherx on Foo's server will then pass the message to the local Jabber server, which will then deliver the message to Foo if he is logged into the system. If Foo is not logged into Jabber at that time, the message is stored offline for Foo to retrieve when he logs in later.

Now lets consider that Foo is not a Jabber user, but uses AIM (poor soul!). So when Fred sends his message to Foo, it is again received by the Jabber server he is logged into. The Jabber server will then pass this message to the Etherx, as the user is not running a native client, and the Etherx will then pass the message onto the matching transport application. If the AIM transport is running locally then the Etherx will communicate directly to it. However, if the transport is running on another server, the Etherx will pass the packet to the remote Etherx on a server that is running the appropriate transport. Once with the correct transport, the XML data stream will be transformed into the native format of the IM system and forwarded onto that IM system.

HOW DOES JABBER KNOW IF YOU ARE LOGGED ON OR NOT?

With Jabber there is the concept of presence, much the same as there is for Yahoo! Messenger and other IC systems. Presence indicates if, in this case, the user is currently available. With Jabber, clients should set the user's presence to 'available' once they have logged into a Jabber server. The user can then allow other entities (i.e. users, transports) to see their presence information via a method of subscriptions.

Jabber's subscription system lets one user allow specified users to see him online, whilst not allowing others to be aware of this. So in the case of Fred and Foo, until Fred authorises Foo to see him online, Foo will not be allowed to see if Fred is logged in or not. For Foo to see Fred, he would have to send a subscription request to Fred, and Fred would then authorise it. Once this authorisation is complete Foo would be able to see if Fred is online or not when he logs into the server.

JABBER CLIENTS FOR LINUX

Gabber

<http://gabber.sourceforge.net>

This is a GNOME client designed to be easy-to-use without foregoing some of Jabber's more advanced features.

Jarl

<http://jarl.sourceforge.net>

A cross-platform Perl/Tk-based client.

Konverse

<http://konverse.sourceforge.net>

This simple KDE client follows the tradition of calling itself something beginning with 'K'.

Pybber

<http://pybber.sourceforge.net>

Yes, you've guessed. A Jabber client written in Python.

Sjabber

<http://www.pipetree.com/jabber/sjabber>

A console-based client.

Jabberzilla

<http://jabberzilla.mozdev.org>

Jabber for Mozilla.

JabberApplet

<http://jabberapplet.sourceforge.net>

Tiny Java applet weighing in at just 60k.

The subscription information is not held locally, but is maintained on the Jabber server itself. This information is called a Roster, and as it is held on the server, users can log in from any machine and still have access to their subscription information. In addition to subscriptions, the Roster can also hold other information such as nicknames or groups that the user has joined.


IS THIS ALL JABBER CAN DO THEN?

Not at all. Recently a company called Transvirtual have developed the PocketLinux development platform, which is designed to be used in embedded systems, specifically PDAs. Jabber is used within PocketLinux as a means of communicating to other devices using XML data streams or meta-data. In other words, differing devices (PDAs, mobile phone, PCs) could be seamlessly connected and transfer data to each other without worrying about the type of device that is being communicated with. The only requirement is that these devices can understand the Jabber XML data stream.

It is important when thinking about Jabber to remember that the messages that are sent via the system may not necessarily be destined for another human being, or

even be generated by human input. Jabber can be used as a method of delivery any type of data. So you could program your GNU/Linux box to send out a Jabber message to your lighting system to switch on your lights at a set time, switch on your television, program the microwave and so on. However, it is within the embedded space that Jabber is expected to make its mark – as demonstrated by PocketLinux – using its capabilities beyond standard messaging systems. As Jabber is a fully open source project, its protocol, XML tags (DTD), and architecture can be used and extended by anyone who needs to provide data communication between embedded devices. Even within a standard infrastructure there is a wide scope for the use of Jabber, with serious potential as a middleware platform. If you can think of a situation where two differing applications, devices etc, need to communicate with each other in some way, Jabber could well provide the solution that is needed.

WHERE CAN I FIND OUT MORE?

The best place to start with Jabber is to visit jabber.org. This provides more in-depth documentation on the whole system, its protocol and architecture and the source code for the Jabber server software should you wish to set one up. However, client applications are not available at jabber.org as they only concern themselves with the Jabber server and architecture. If you're looking for a Jabber client application for Linux, check out the sites listed in the boxout (left), and if you need a client for another platform visit jabber.com or alternatively do a search for Jabber at sourceforge.net. 

Web resources

Jabber Open Source home page: www.jabber.org

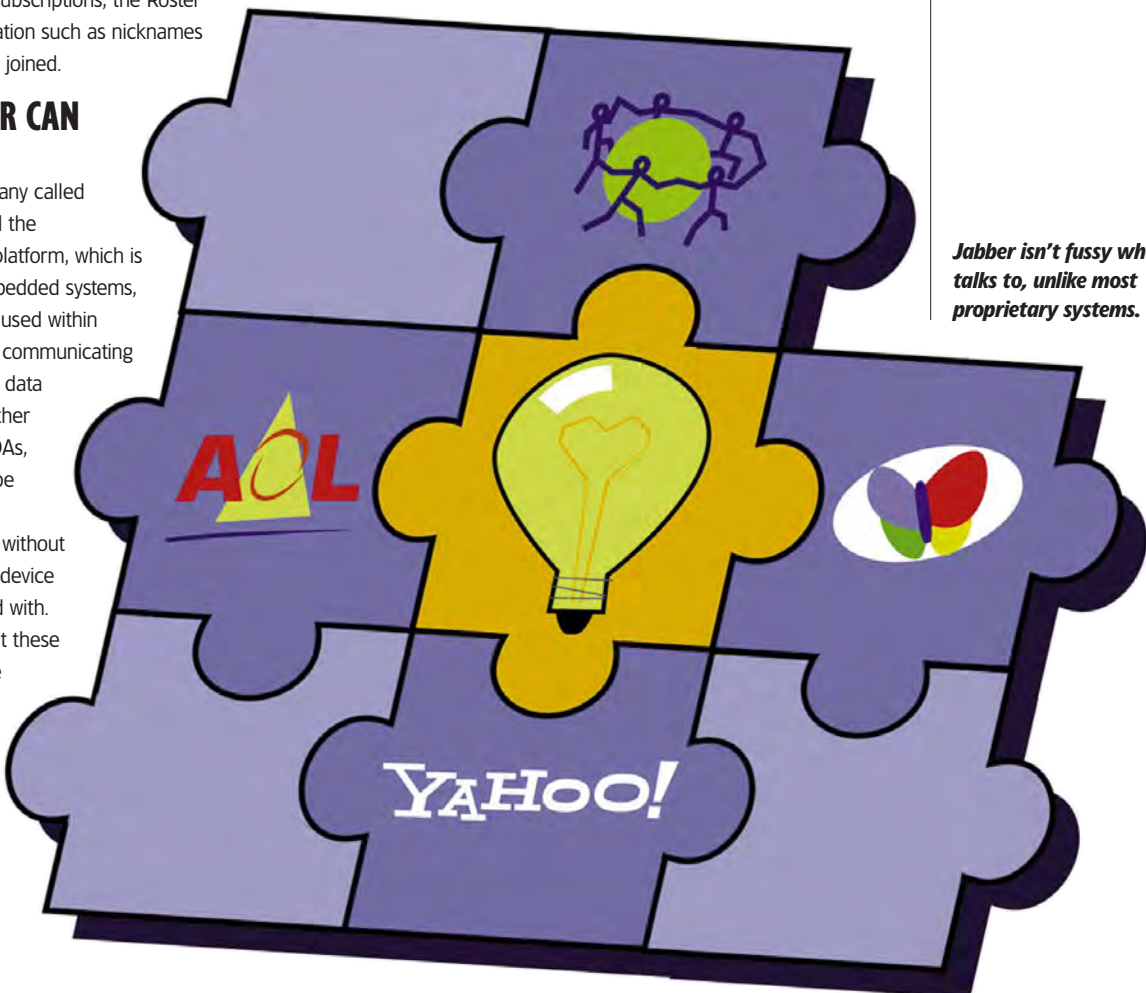
Jabber news and information: www.jabbercentral.com

Jabber commercial home page (still Open Source): www.jabber.com

Jabber documentation: docs.jabber.com

XML information: www.w3.org/xml

Jabber isn't fussy who it talks to, unlike most proprietary systems.





If you've got problems, your're in the right place. As I'm sure you've already discovered, Linux users are a friendly bunch, only too keen to help you with your problems. That extends to the magazine too, where we'll have a go at answering any query you send us, no matter how simple, now matter how difficult - even if it makes our heads bleed just thinking about it.

Please feel free to email or write in with your own particular queries. The most interesting ones will be printed here every issue. We won't be able to reply personally, so please don't be offended if you don't hear from us. If you want to stand a better chance of having your question featured, read the submissions advice boxout on page 83!

No question is too tricky for us to track down the answer, so do your worst - we've got a team of experts from around the Linux world to take on the challenge!

Nick Veitch
Editor

ANSWERS

If you are really stuck, why not write in? Our resident gurus will answer even your most complicated problems!

Problems with kernel 2.4.0

Q When building the 2.4 kernel and I do **make xconfig** I get the following error:

make : wish : Command not found

make : * [xconfig] Error 127**

Any ideas? I've scoured the 'net but with no joy. I am running Linux Mandrake 7.2, currently with kernel 2.2.18, through KDE2 and XF86 4.0.



A Wish is part of the TCL/Tk toolkit and is used by xconfig to create the graphical configuration screen. You obviously don't have this installed on your system. On Mandrake these should be available in two packages, one called tcl and one called tk, and should be on your Mandrake install CD. If not, pay a visit to www.rpmfind.net.

More problems with 2.4.0

Q I am trying to build a kernel from the 2.4.0 source code supplied on the coverdisc that came with issue 11 of Linux Format. It works fine until I enter 'make zimage', where I get the reply:

make: * No rule to make target 'zimage'. Stop.///end///**

What's going wrong?

A This was a mistake in the instructions we gave -Oops! Make is case-sensitive: you need to use **make bzImage** rather than **make zimage**. In actual fact, you'll probably want to do **make bzImage** instead. This compresses the compiled kernel image with bzip2 instead of gzip and so creates a smaller resultant 'vmlinuz' file.

And there's more.

Q I'm running SuSE 7.0 and trying to compile a 2.4 kernel. When I enter **make bzImage**, I get the following text on the screen:

```
gcc -Wall -Wstrict-prototypes -
O2 -fomit-frame-pointer -O
scripts/split-include
scripts/split-include.c
In file included from
/usr/include/errno.h:36,
from scripts/split-include.c:26:
/usr/include/bits/errno.h:25:
linux/errno.h: no such file or
directory
make: *** [scripts/split-include]
Error 1
```

A This is a problem is due to where you have unpacked the kernel source code. The default location for this is /usr/src/linux and some of the header files expect the kernel source to be there. The usual practice is to create a symbolic link from that path to wherever you have actually unpacked the source code. This allows you to work with several kernel source trees at the same time more easily.

Unfortunately, our instructions in

issue 11 weren't that clear. Login as root or gain superuser privileges with **su**, and **cd** to /usr/src. If you already have a symlink called 'linux' here remove it with

rm linux

If there's a directory called 'linux' here, move it to another directory with, for example:

mv linux linux_old

You are now ready to unpack the kernel source tree. Enter

tar zxvf <path>/linux-2.4.0.tar.gz

where <path> is wherever the kernel archive is located. If this is from the issue 11 coverdisc, then it will be something like /mnt/cdrom/othersoftware/kernel2.4.0.

Rename the newly created Linux directory to something more helpful with:

mv linux kernel-source-2.4.0

and create the symlink with:

ln -s kernel-source-2.4.0 linux

You can now **cd** to this directory and follow the usual build procedure.

Cross-eyed?

Q I've tried playing with this a few times, but have never got very far. I have a number of various spec'd PC's running different distro's of Linux, an RS/6000 about to have YellowDog Linux installed, and two O40 powered Amigas that could run Linux/68k.

What I'd like to know is how can I

DEB AND RPM CORRECTION

Last month we answered a question, whether it was possible to install Debian packages on an RPM-based system, incorrectly. While the answer was right in saying that it would be difficult to install the Debian package handling system on an RPM-based system, it is of course possible to convert Debian packages to RPMs and then install them as usual.

The tool you need to do this is called *alien*, and if it's not available with your chosen distro, then you can search for a copy on rpmfind.net. Install this and you'll be able to convert a deb package with a command like

```
alien -r foobar.deb
```

This will generate a package called *foobar.ARCH.rpm* - where ARCH is the architecture that the package *foobar* has been built for, if any - which you can then install with *rpm* as per normal.

The answer we gave last time is also incorrect when it says *dselect* has been replaced with *apt* in newer Debian distros. *dpkg* is the tool that is used to install, build and configure packages on a Debian system and *apt* is the tool that is used to retrieve them for you from a specified package source, resolve dependencies and so on. *dselect* is just a menu-based front-end to both tools and has not so far been replaced. You can, of course, use a graphical alternative to *dselect*, such as *KPackage* or *StormPkg*.

```
File Sessions Settings Help
dselect - inspection of package states (avail., priority) verbose:0 help:0
EIOM Pri Section Package Inst.ver Avail.ver Description
----- Up to date installed packages -----
----- Up-to-date Required packages -----
----- Up-to-date Required packages in section base -----
*** Req base ae 962-28 962-28 Anthony's Editor -- a tiny full-screen editor
*** Req base base-files 2.2.6 2.2.6 Debian base system miscel
*** Req base base-passwd 3.2.0 3.2.0 Debian Base System Passw
*** Req base bash 2.04-9 2.04-9 The GNU Bourne Again SHel
*** Req base bsdtails 2.10q-1 2.10q-1 Basic utilities from 4.4E
*** Req base console-data 1999.08.29- 1999.08.29- Keymaps, fonts, charset m
*** Req base console-tool 0.2.3-17 0.2.3-17 Linux console and font ut
ae installed: install (was: install). Required
ae - Anthony's Editor -- a tiny full-screen editor

ae is a tiny full-screen text editor with both modal (vi-like) and modeless
(emacs-like) modes, determined by an ae.rc config file.

Keybindings are configurable in the configuration file. The default config
file is /etc/ae.rc, but other configuration files are provided in
/usr/share/doc/ae, as an alternate example.

description of ae
```

Rumours of *dselect*'s demise have been greatly exaggerated.

compile a kernel for one platform on another platform? I would like to compile a Linux/68k kernel on either the RS/6000 or one of the quicker Computers?

On a different note, being a long standing *Amiga Format/Shopper* subscriber, I was presented with a fait de complis with *Linux Format*, but enjoy it nonetheless. If I had one criticism, it would be that the other

platforms rarely get a look in. I appreciate that the i386 platform is always going to be the most prevalent, but I think other platforms should get a mention from time to time... at least the other 'home' platforms anyway. I don't suppose many of your readers will have an IBM RS/6000 at home, let alone an IBM mainframe. Just my opinion for what it's worth.

The screenshot shows the emdebian website. The main heading is 'emdebian' in a stylized font. Below it, there's a section titled 'The Embedded Debian Project'. Under this, there are two columns: 'Press Gallery' and 'News'. The 'News' column contains several bullet points with dates and descriptions of releases and updates. The 'Downloads' section lists various packages available for download, including GCC cross-compilers and Binutils. The 'Resources' section provides links to CVS repositories and bug tracking systems.

You'll find pre-built cross-compilers here.

Keep up the good work, and if you can help with my query then all the better.

A If you have the necessary cross-development tools, compiling a kernel image for a different

for these packages from www.gnu.org. It is quite simple to do. During the configuration stage, you add the option **—target** to specify the target of the compiler if it's different from the host that the compiler is running on. So, for example, if you wanted to build a 68k compiler you, would configure each package with:

```
/configure —target=m68k-linux
```

If you then were to make and install this, you would end up with a set of the standard GNU tools (in this case in the default path `/usr/local/bin`) all with the prefix 'm68k-linux-'

Once you have the necessary tools, you can cross-compile a kernel image. You will need some patches to turn the standard kernel source tree into something that is buildable and will run on an m68k - see www.linux-m68k.org. The PPC kernel tree, on the other hand, has been merged into the main tree with the 2.4 series kernel. See www.linuxppc.org or www.penguinppc.org.

Before you do anything, you will need to specify the architecture you want to build for. You can do this by editing the kernel *Makefile* and changing the variable ARCH at the top of the file to the architecture you wish to build for. You should then be able to configure and build the kernel as normal.

As for your point that we focus too much on the x86 platform, I think that is unfair. With the exception of the coverdisc and perhaps some reviews, the material in the magazine is →

architecture is relatively straightforward.

There are pre-built GNU tools for cross-development targeting Linux on PowerPC, MIPS and ARM platforms available from, for example, www.emdebian.org. The chances are, though, that you are going to have to build them yourself.

You will need at least to build *binutils* and *gcc* for the target platform. You can get the source code

→ largely architecture-neutral. The standard PC is by far and away the most popular Linux platform, but perhaps we should devote more space to Linux on non-x86 CPUs. What do our other readers think?

Telnet

Q I want to be able to access my Linux box (mainly used as a server) remotely from a PC, so I can install, update, change settings and so on. I understand I can use telnet to do this, but what do I need to install?

A Telnet is fine for this sort of thing, as long as your network is secure (i.e. you are behind a firewall, and you trust whoever else is on your network). It may be worth checking out SSH as an alternative, as this uses encrypted access (otherwise snoopers might be able to detect your password when you log on).

Telnet may or may not already be running. A quick this way to check is to type:

```
netstat -a | grep telnet
```

If you get a line with something like:

```
tcp 0 0 *:telnet :* LISTEN
```

returned, then telnet is already installed and running.

You can then run a telnet client on your Windows machine. If it is administration stuff you are doing though, a really good option is to install Webmin on your Linux box. This allows you to change all sorts of things on the server through an easy-to-use web interface (which will be easier to run from Windows), and you can use telnet through that too if you need to. Check out www.webmin.com/webmin

Aliases

Q I am happy running Mandrake 7.2, and have managed to get to grips with KDE2 and the terminal too, to some extent (newbie to Linux, but some experience with Unix in the past). I understand that I can use the alias command to create new commands I can run in the shell, but

[Index](#)
[index by Group](#)
[index by Distribution](#)
[index by Vendor](#)
[index by creation date](#)
[index by Name](#)
[Mirrors](#)
[Help](#)
[Search](#)

Welcome to the RPM repository on rpmfind.net

rpm2html automatically generates Web pages describing a set of [RPM](#) packages.

[The Rpmfind tool](#) allows automate the search of packages from the RPM Database or maintain your system up-to-date in a more automated way.

The goals of rpm2html are also to identify the dependencies between various packages and to find the package(s) providing the resources needed to install a given package. Every package is analyzed to retrieve its dependencies and the resources it offers. These relationships are expressed using hyperlinks in the generated pages. Find package providing the resource you need is just a matter of a few clicks!

Check the [FAQ](#) in case of problems with rpm2html or rpmfind.

The proper working of the rpm2html tools requires the package maintainer to properly comment their RPM(s), if you maintain packages, make sure that the info provided adequately (URL, email, ...).

Learn how to [build your own mirror](#) of this site. **Do not try to mirror it with a Web copy tool**

This archive hosts 113558 RPMs representing 200480 MBytes of data

- The list of [RPM indexed by category](#)
- The list of [RPM indexed by date of creation](#)
- The list of [RPM indexed by name](#)
- The list of [RPM indexed by maintainer](#)
- The list of [RPM indexed by distribution](#)

Sub Directories

www.rpmfind.net is a great resource for pre-compiled applications.

once I close the shell, I have to type them all in again. Is there any way to create the aliases and have the computer remember them?

A I think we had a similar question a few issues ago. The answer is that yes, you can. But rather than set up a process to run on startup, you should edit the .bashrc file, which is run every time a bash shell is created. You'll find the .bashrc file in your \$HOME directory, that is, the home directory for the account you are logged in under. Edit the file (it has a full-stop at the start of it, which means that it is normally hidden by file requesters and the list command) in your favourite editor and add the alias commands on separate lines. You'll probably find, running Mandrake, that some useful aliases have already been set up like:

```
alias rm='rm -i'
```

Which basically means that when you type: **rm fred** the shell will interpret it as:

```
rm -i fred
```

This is a very useful feature (in this case it means you are always queried when removing files), but otherwise you have to be careful that you don't assign an alias to a name that

already exists – bash won't check this, and, if it happens, you'll be unable to use that command from the shell.

RPMs

Q I'm constantly having problems with rpms. My trouble is, I try a lot of stuff, but I don't have a huge amount of disk space for Linux to play with. When I come to remove it again (RPMs are supposed to make this easy too, right?) I usually end up searching for hours with something like kpackage to remove it. I'm happy to do it from the terminal because I find this easier, and frankly a lot faster, but it's often difficult to remember the exact name of the package. Any suggestions.

A Mmmm. This sounds like one for grep. You can use the **rpm** — query to find out if a particular package is installed. You can also query the database for all the packages installed using:

```
rpm -qa
```

However, this will print off reams of names and version numbers, and you'll be in much the same position as before. So the cunning way to do this is to pipe the output through grep. Grep is a tool which searches through input and tries to match a given pattern. So, if you even know just

vaguely what the package might have been called, you can search for it with the line:

```
rpm -qa | grep drak
```

This will find all packages with 'drak' in the name.

Alternatively, if you know the location of one of the files installed by the no-longer wanted package, you can use:

```
rpm -qf <filename-including path>
```

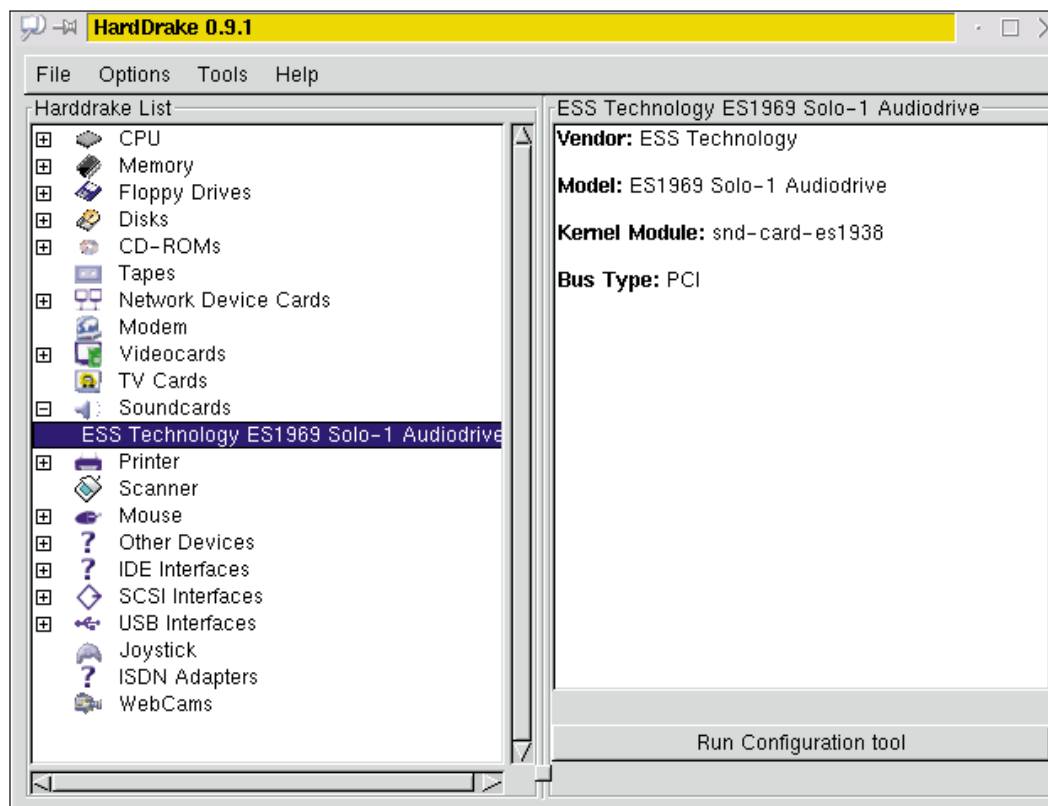
which will return the full name of the package which installed it.

Sound and vision?

Q Having managed to install and run a very functional Mandrake 7.1, I was delighted to obtain your Christmas issue which included Mandrake 7.2, KDE2 and KOffice, and immediately decided to upgrade my installation to the latest version.

I was horrified to find that using the "upgrade" option caused my system to crash with a black screen, presumably a problem with the X server. So I started again using the "install" option, which gave exactly the same result.

After many attempts, I had some success by using the "expert" option (which I am not!) and by selecting



Audio configuration is handled by HardDrake in Mandrake 7.2, but it is there.

the old version of XFree86, which enabled me to use an 800x600 display but not 1024x768 which worked fine on Version 7.1.

Also, Mandrake 7.2 refused to configure the sound card, but again, "sndconfig" on 7.1 set it up perfectly. I notice that sndconfig has been dropped from the latest version.

My system is a 500MHz Celeron with 128Mb of RAM, an AT3D 4Mb graphics card, a 10.2Gb harddrive and a Crystal 4232 sound card.

I was forced to reinstall 7.1 from scratch, and I would be interested to know if any other readers have had similar problems with your CD, and if you could help me to achieve the same configuration as I had with Mandrake 7.1.

A Mandrake 7.2 had XFree86 version 4.0, which still had a lot of problems with some display cards, although the Alliance AT3D is supposed to be supported. You could try upgrading to version 4.0.2 supplied on this issue's coverdisc.

You really need to find more information to find out what's going wrong. Can you boot into console

login with Mandrake 7.2? Enter 'linux 3' at the LILO prompt to do this.

Now enter **startx** to start up X Windows manually. If this produces output too quickly for you to read, try redirecting the output to a file, for example: **startx 2> xlog.txt**. How far does it get into the start up before things go wrong? Does it recognise your graphics chip set? Are there problems with the XF86Config file? The **sndconfig** tools has been superseded by **HardDrake** in Mandrake 7.2. You can start this by from your desktop menu, or by entering **harddrake** from a shell. **HardDrake** should be able to detect and automatically configure your sound card.

Redial

Q I use a dialup service which places restrictions on my Internet connection. You know the sort of thing, logs off after an hour, can't use certain services and so on. I won't name them because I don't want them finding out what I'm doing (or am I just paranoid). Anyway, I'd really like my connection to be available pretty much all the time. I

am hoping to set up an old box as a server and network two other machines to it, and I'd like to set it up so that I can always access the net. Surely, this must be possible.

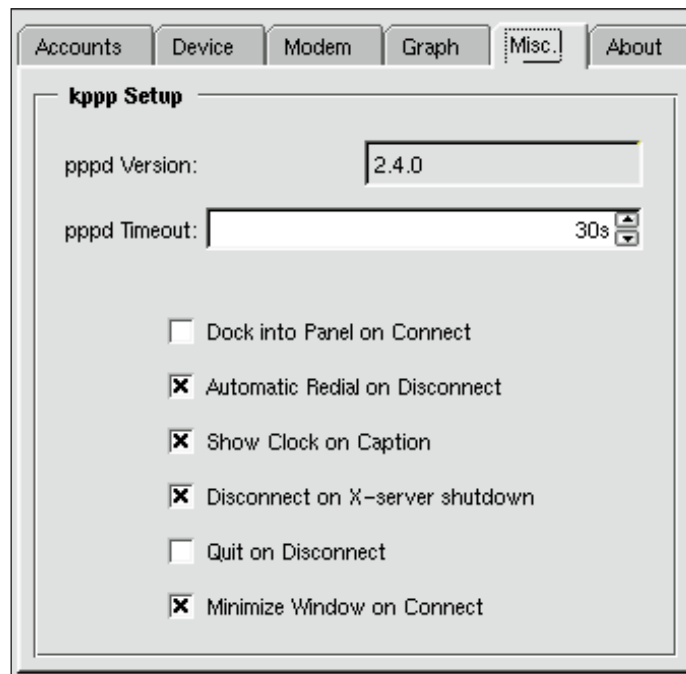
A You have a few problems here. One is certainly that the line is

dropped after a certain amount of time. This is easily solved, as most dialup clients can automatically reconnect – check the documentation. In **kppp** for example, you can access this option under the **Misc.** tab in the settings section. For other systems, you may need to edit a **.conf** file (**wvdial** for example).

Another problem might be that the connection will be dropped after a certain period of inactivity (usually about 20 minutes). You could easily write a script that pinged the DNS server or whatever every few minutes to get around this.

More to the point though is why you are doing this? Keeping your connection up all the time on such a service is a bit antisocial isn't it, especially if you aren't really using it during all that time. Another thing you might face is that various schemes have thrown off their "high use" customers for being on-line all the time.

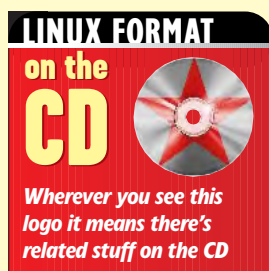
If you just want Internet access to be available, why not install something like **SmoothWall** on your server (www.smoothwall.org) which was on our CD on issue 8, though more recent updates are now available. This will allow you to cause the server to dial out when required, and not annoy everyone else. **LXF**



kppp can be set to auto, automatically redial if the connection is broken.

Linux Format COVERDISC

Paul Ravening once again guides you through the uncharted waters that are the Linux Format CD



Hello again. If you've had a look at the CD already this month, you'll notice that the interface has changed slightly. Basically we've just made it look more like our website (it's all about branding or something). However changes are afoot, and it will be changing again shortly. So while we're in this time of transition, we thought it would be good to find out what you want from the CD Interface. Do you use it? If so what do you like, and what could do with improving? Would you like more information, tutorials and other material in HTML format?

Let me know your thoughts by emailing me: paul.ravening@futurenet.co.uk. On the subject of mails, I'd like to thank all the people who've taken the time to contact me with suggestions already, they've all been thrown in the LXF melting pot and we'll see, ahem, what comes out the other end.

So what do we have on this month's disc. Well, to kick off, we've got *StarOffice* and Corel's *WordPerfect 8*, two giants in the office software circles. Keeping up our business theme, we have a business folder with a selection of software for use at home and in the office. Accompanying these in the other software folder, you'll find *KDE2*, the latest updates to the kernel, a great selection of Hot Picks, the games from our round up and a mirror of the LDP.

Well I'd better be getting on with next month's discs now (The word huge springs to mind). Nose to the grindstone and all that. Enjoy.

Paul Ravening
New Media Editor



“I'd like to thank all the people who've taken the time to contact me with suggestions”

IMPORTANT NOTICE

Before you even put the CD in your drive, please make sure you read, understand and agree to the following:

The Linux Format CD 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 CD 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.

WordPerfect 8 for Linux

Paul Ravening takes you around the wonderful world of *WordPerfect*

WordPerfect 8 for Linux Personal Edition is a world-class word processor, native on Linux, offering the same outstanding tools, intuitive graphical interface and file format as its Windows counterpart. As well as basic text processing, WP8 imports over 40 document types (including Microsoft *Word97*), and supports over 1,000 different printers.

Other features include on-the-fly spelling and grammar checking, document revisions, drawing layers, enhanced table handling and an integrated file manager: it is obviously a full-fledged word processing package.

It's best to have a subdirectory called 'Data' where all your real files can be safely stored

In fact, it has more features than most people will ever use.

Once you've extracted the zipped file, you should find two important files named **Readme** and **Runme**. After reading the Readme, run the Runme script. It may ask you a few simple questions, like whether you have untarred the downloaded files and whether you are using X (you should be). Then the setup wizard appears! It asks for an installation directory, so assign it to `/usr/local/corel/`. There is no indication of what the default might have otherwise been, so be sure to type something here so your files won't get lost. If you are installing as a normal user (you should be), you may not be able to write to `/usr/local/`. Instead, you should give it a place to live in your home directory, for example: `/home/paul/corel`. The setup also offers to borrow information from a previous

install of *WordPerfect*. If you don't have one just tell it to continue. After agreeing to the license and a few other things, setup completes.

After installation, you may want to give *WordPerfect* administration privileges to regular users. (If you installed as a user, you should already have admin permission). This will allow the named users to change printer drivers or global settings. Start up with the command `/usr/local/corel/wpbin/xwp -adm`. Click Preferences, Admin and add your user name to the list (or you could create a WPAdmin group and give privileges to all its members). Don't

name, so you may want to change this. The important thing for me was to hit Preferences, Files and point it to my default data directory. *WordPerfect* defaults to your \$HOME directory, but usually they are so cluttered with config files and automatically created junk that it's best to have a subdirectory called 'Data' where all your real files can be safely stored. Setting the default folders for all kinds of files is easy, as is opening and saving files, thanks to *WordPerfect's* nifty file manager. (Just press the browse button!) You can also change the colour scheme, design your own custom status bar (called the 'Application Bar'), and adjust various other visual properties from here.

I'll leave it to you to explore *WordPerfect's* other powerful features from here.

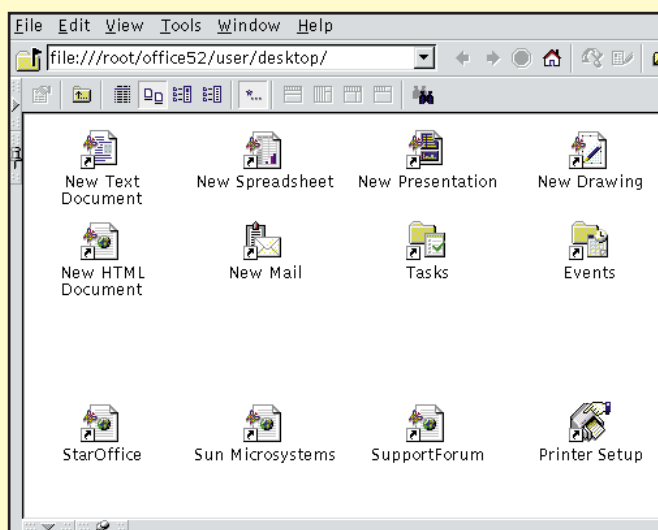


Corel's smashing new logo.



STAROFFICE 5.2 for Linux

Time to put your productive business head on with StarOffice.



StarOffice's file manager is the hub of the suite.

I've always been a big fan of this innovative office suite, and I still remain impressed by the polished, tightly integrated utilities in this version. But, for those of you who are new to the StarOffice brand, we'll explain a bit about the product. StarOffice 5.2 is a

fully-featured, multi-platform productivity suite that provides a complete set of easy-to-use, powerful tools for accomplishing your day-to-day personal or business tasks, providing more functionality than most other software out there.

StarOffice 5.2 software comes with a standard set of both key and complementary components:

StarDesktop A complete workspace environment with file and Web browsers, online help and much more
StarWriter A full-featured word

processor with new colour revision mark support and exhaustive file format support.

StarCalc A multi-sheet statistical spreadsheet with support for revision marks.

StarImpress Presentations software

StarDraw Vector graphics tool with 3-D rendering.

StarBase A serious DBMS with support for SQL, ODBC, JDBC, Oracle and more.

StarMail with POP3, IMAP and VIM (cc:mail) support.

StarDiscussion Threaded newsreader.

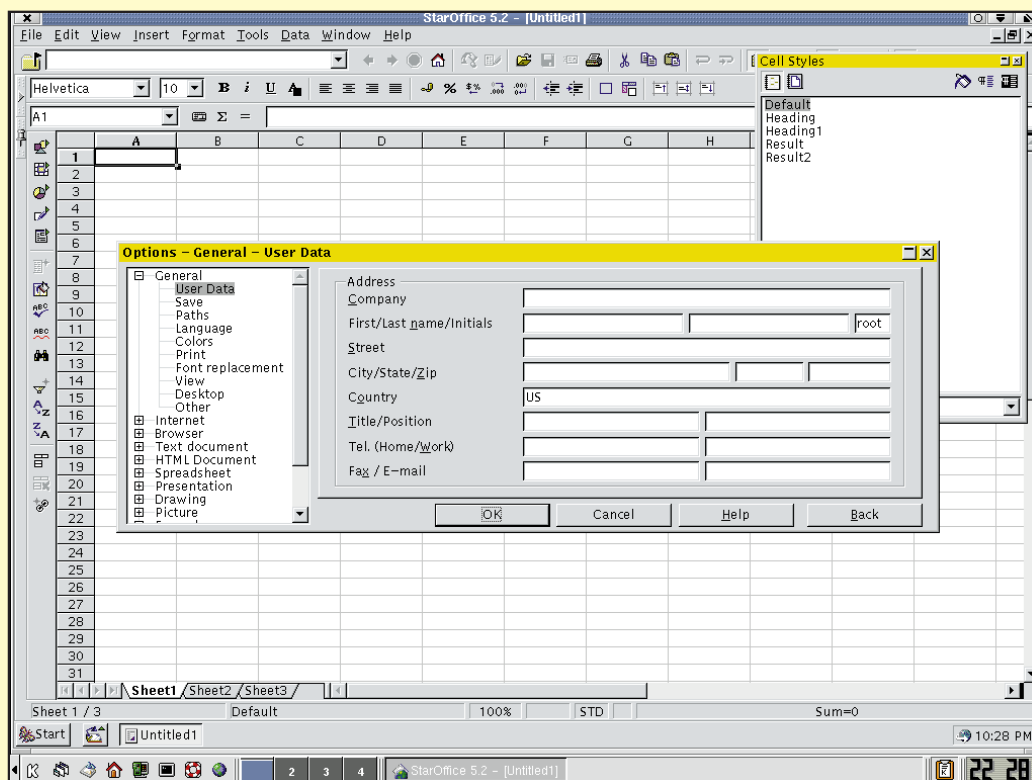
StarChart Graphing software.

StarImage Image-editing software with Twain image acquisition.

StarMath formula editor.

StarSchedule with integrated messaging.

The result of this comprehensive feature set is a large application – A Pentium II or better with a lot of RAM is a good installation candidate.

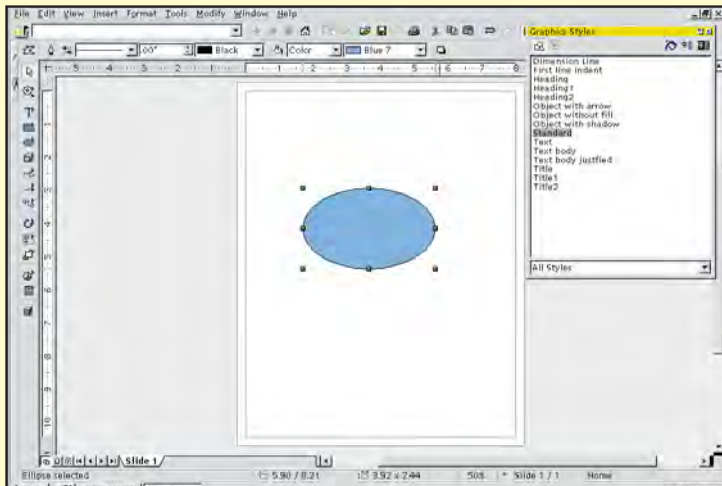


The Spreadsheet in StarOffice has all the features you would expect, including document templates.

TRUE TYPE TROUBLE

Under Linux, the StarOffice browser does not handle TrueType fonts.

Many Web sites are written to the Windows font library and can be difficult to read, especially in the italic font that the StarOffice browser uses to render so many of the fonts it doesn't know about. To get a more readable display, try going to Tools | Options | General | Font Substitution. Now you can map Arial, Lucida, Verdana and Geneva to Helvetica.



StarOffice points the way forward to 'document-centric' computing.

You also get some features such as multi-user (network) installs and middle-mouse-button scrolling. Linux is supported only on x86 computers. A dozen other platforms are currently supported, including OS/2, DOS, and several commercial UNIXs.

We live in a wired world, and today's applications have to work within it. The built-in Web functionality of *StarOffice* means you can browse and locate information on the Web, then simply drag and drop it into your documents, without ever leaving the host environment.

All the key components support one-click HTML creation and a full editing environment.

The e-mail client supports all major Internet standards. You can stay current with newsgroups and enjoy e-mail exchange from a unified desktop. And you can save your diagrams and drawings to popular Web file types like GIF and JPEG.

StarOffice software is all about choice. With the Solaris Operating Environment, Microsoft Windows and Linux versions, the suite is already available on more platforms than any other office suite. Not only that, but the file formats are the same across all platforms, meaning a single file moves seamlessly from platform to platform with no translation necessary. This is a godsend to multiple operating systems everywhere – especially new Linux users like myself who might create a document in *StarOffice* Linux, but then want to revert back to Windows to complete some pieces of the project.

Once you are up-and-running, the desktop is extremely flexible. Although the explorer window is the centre of it all, it spends most of its time tucked away at the side of the screen.

The power of *StarOffice* comes not just from the individual applications but how they work together. For example, your address book is available for your e-mail, and also to mailmerge into a letter; it can also be saved as a Web page or embedded in a spreadsheet to generate charts for a presentation.

When you open *StarOffice* for the first time, you will see the StarDesktop interface. This is what often baffles new users, since it seems to take over the desktop. Let's do a couple of things to make it a more welcoming place to work.

Two important parts of StarDesktop are closed initially. Open them by going to the View menu and selecting first Explorer and then Beamer.

The Explorer pops out from the left side of the screen. If you have a screen with 1024x768 resolution, you should probably find and click the small pushpin icon near the top right corner of its window. This 'sticks' the Explorer firmly to the desktop, preventing other windows from slipping behind it.

The Beamer is a file previewer that descends from the top of the screen. It, too, has a pushpin icon, which you should click for now. Atop the Explorer you'll see a list of tabs that read 'New Group', 'E-mail & News' and so forth. Click on 'Explorer.' These are the files of the *StarOffice* desktop. It may seem strange that the suite has its own

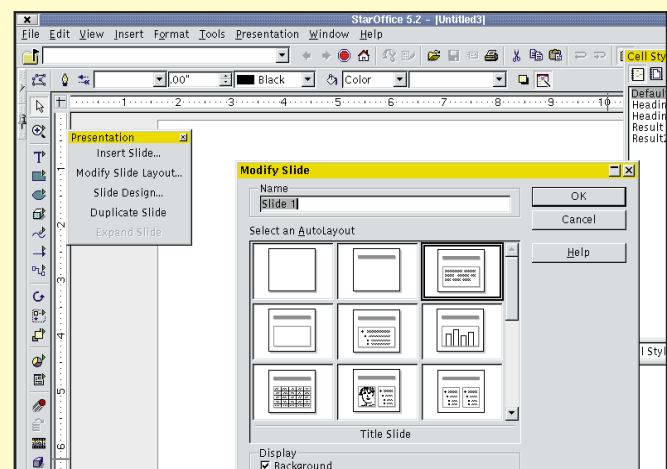
INSTALLING STAROFFICE ON LINUX SYSTEMS

Installing the program under Linux has been made simple. There are only a few things you should remember: If you install *StarOffice* when logged in as a user, you will only be able to use the program when signed in as that user. Installing it as the root user will enable you to see the program from any account. The installation is also quite slow – it might even seem to stop at times, but don't fret. Give it a few minutes and it will complete the task. When the program has finished installing it will put a shortcut on your KDE bar under Gnome/X APPs. You can then run it from there.

desktop, rather than using the normal XWindows desktop, but this approach achieves interface uniformity across platforms. At the bottom, note the 'Workplace' icon. This shows the files in the normal directory hierarchy. Try clicking on various things in the Explorer and then watch them appear in the Beamer. For example, the Gallery contains various multimedia items that are fun to preview by double-clicking

The power of StarOffice comes not just from individual apps, but how they work together

them in the Beamer. It may also be instructive to open some of the items in the Template directory into the main window to see how database fields planted in these documents are updated dynamically with information from the current database. Such normalisation is the great promise of integrated software. Thus, you can send mail to someone inviting them to a meeting and it will write a memo in their calendar program, or offer them a link to add it to their Yahoo! scheduler.



You'll find templates for many common projects in most of the apps.

OTHER SOFTWARE

A nice mix of business software, upgrades and information this month.

Paul Ravening is your venerable host

Once again, the 'other software'

section rears its head. This month, we've got a selection of business software for you to accompany our business feature in the magazine. Plus there's also KDE, kernel 2.4.1 and a mirror of the Linux Documentation Project to keep you up to date.

CBB

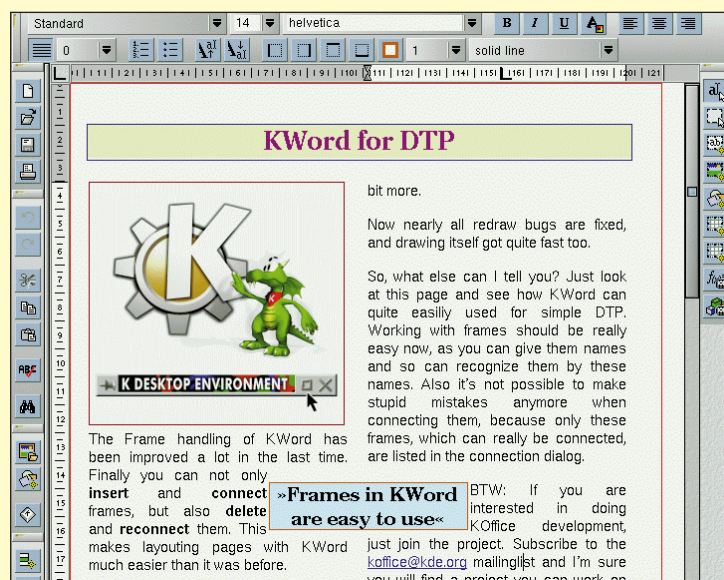
This is a free, open-source finance management application. Written in TCL/Tk and Perl, it is almost completely OS independent and can be used with UNIX, Linux, Windows, MacOS, and more. With **CBB** you can keep track of deposits and withdrawals from your

CBB is free, personal finance management without all those annoying adverts



Chk #	Date	Description Comment	Debit Category	Credit	Total
08/23/1999		Transfer	0.00	1000.00	1000.00
09/01/1999		opening acct	13.70		986.30
09/07/1999		bank charge	201.00	0.00	785.30
09/14/1999		ATM withdraw	cash	0.00	785.99
09/18/1999		interest	100.00	0.00	685.99
09/20/1999		ATM withdraw	cash	0.00	700.99
09/28/1999		unknown note	Miscellan	15.00	640.99
09/30/1999		ATM withdraw	cash	60.00	1390.99
10/02/1999		Transfer	0.00	750.00	3366.39
10/06/1999		U.H. salary	1975.40	0.00	3382.79
10/06/1999		unknown note	salary	0.00	3282.79
10/07/1999		ATM withdraw	Miscellan	100.00	2965.34
10/13/1999		Transfer	cash	317.45	2865.34
10/14/1999		payment	[fhbmcl	100.00	2867.18
10/19/1999		ATM withdraw	cash	0.00	1427.98
		interest	0.00	0.00	4295.16
		U.H. salary	0.00	0.00	

Keep an eye on your outgoings with CBB, a handy finance management program.



Kword, one of the most popular Linux word processors out there.

current accounts, savings accounts, credit cards, and investments. You can also create reports summarising your current financial state, graph your Net Worth and watch it grow (or shrink!). The application also works with existing Quicken accounts. This is free, personal finance management without all those annoying ads, a program for anyone who would like to balance their chequebook and manage their money using free software under Unix and X11.

CBB is intended to be an open, extensible program and utilises a simple, tab-delimited data file format and, because it is written entirely in Perl and Tcl/Tk, it is very modifiable. In addition, it provides a simple interface for users to add their own reports, graphs, and external modules without modifying any of the source code.

Although this is still in the early development stages, it is highly useable and should satisfy most personal finance needs. Currently, it has been tested only on Linux, but it should work

under most UNIX variants. Mac and Windows versions of Perl and Tcl/Tk exist and are highly compatible with UNIX versions, so it should be fairly easy to make the application work in those environments.

KOFFICE

KOffice is an integrated office suite for KDE, the K Desktop Environment. **KOffice 1.0**, released with KDE 2.0, includes (takes deep breath) **KWord**, **KSpread**, **KPresenter**, **KIllustrator**, **KFormula**, and **KChart**.

KSpread is a spreadsheet application. **KPresenter** is a presentation application. **KIllustrator** is a vector drawing application. **KWord** is a **FrameMaker**-like wordprocessor application. **KChart** draws charts and diagrams. **KFormula** is a formula editor. Other components are being developed for upcoming releases of the suite. These include **Krayon**, a painting and image editing application, **Graphite**, a graphing application, and the last

acquired program is *Kivio* a flowcharting application. We'll have these as soon as they are available.

GNUMERIC

Gnumeric is a powerful and easy to use spreadsheet program from the *GNOME* project. As it sets out to compete feature-for-feature with the leading commercial offerings, users of *Excel* should already be familiar with *Gnumeric's* advanced features. A plugin system lets you extend the program with GPL extensions, and optional Python and Perl plugins let you define complex functions in those languages.

LINUX DOCUMENTATION PROJECT

Still being the relative newbie on the block, I'm using every resource I can to brush up my Linux knowledge. The best place I've found on the web so far is the Linux Documentation Project site.

For those of you who aren't familiar with the it, the LDP consists of a large group of volunteers working on documentation for the Linux OS. It was started to provide new users a way of getting information quickly about a particular subject. It not only contains a

series of books on administration, networking, and programming, but has a large number of smaller works on individual subjects, written by those who have used it. If you want to find out about printing, you get the Printing HOWTO. If you want to do find out if your Ethernet card works with Linux, grab the Ethernet HOWTO, and so on. So on this month's CD, we've got a

mirror of the entire site to save you those pennies on your phonebill.

KERNEL 2.4.1

The latest stable Kernel release is 2.4.1 (at time of going to press), and we've included it on the CD again for you this month. If you need help installing it, either read our guide from last issue, or have a look at the LDP.

The ultimate source of all knowledge. Apart from Linux Format of course.

	A	B	C	D	E	F	G
1		DOS	Linux	SCO			
2	January	1,000	900	500			
3	February	900	2,500	300			
4	March	800	4,100	100			
5	April	700	5,700	(100)			
6	May	600	7,300	(300)			Bad year
7	June	500	8,900	(500)			
8	July	400	10,500	(700)			
9	August	300	12,100	(900)			
10	September	200	13,700	(1,100)			
11	October	100	15,300	(1,300)			
12	November	0	16,900	(1,500)			
13	December	(100)	18,500	(1,700)			
14							
15	Totals:	5,400	116,400	(7,200)			
16							

Even with the features in *Gnumeric*, our esteemed Editor couldn't work out his bar bill from New York.

USER GROUPS

Wherever you are in the world, there'll be a Linux User Group somewhere near you. There are thousands of dedicated User Groups all over the UK alone, so find the one nearest to you now!

UK LUGS One of the great things about Linux is that you are never alone. There are thousands of User Groups worldwide, full of members keen to help with your problems, discuss ideas and generally natter about all things Linux.

We have collected a load of information here so you can find the LUG closest to you.

You can find lots more information online at:

www.linuxformat.co.uk or at **www.lug.org.co.uk**

1 HAMPSHIRE
URL: www.hants.lug.org.uk
Contact: Ken Adams

2 BRISTOL & BATH
URL: www.bristol.lug.org.uk
Contact: Dave D

3 SCOTTISH
URL: www.scottish.lug.org.uk
Contact: Tony Dyer

4 OXFORD
URL: www.oxford.lug.org.uk
Contact: Alasdair G Keron

5 BROMCOM (KENT)
URL: www.brighton.lug.org.uk
Contact: John Mills

6 BRIGHTON
URL: www.hants.lug.org.uk
Contact: Johnathan Swan

7 SUSSEX
URL: www.sussex.lug.org.uk
Contact: Mike Pedley

8 NORTHANTS
URL: www.northhants.lug.org.uk
Contact: Kevin Taylor

9 ANGLIAN
URL: www.anglian.lug.org.uk
Contact: Martyn Drake

10 MILTON KEYNES
URL: www.mk.lug.org.uk
Contact: Denny De La Haye

11 DONCASTER
URL: www.doncaster.lug.org.uk
Contact: Andy Smith

12 SOUTH EAST
URL: www.southeast.lug.org.uk
Contact: Ian Reason

13 WEST WALES
URL: www.west-wales.lug.org.uk
Contact: Ken Adams

14 WOLVES
URL: www.wolves.lug.org.uk
Contact: Jono Bacon

15 PETERBOROUGH
URL: www.peterboro.lug.org.uk
Contact: Steve Gallagher

16 EDINBURGH
URL: www.edinburgh.lug.org.uk
Contact: Alistair Murray

17 TYNESIDE
URL: www.tyneside.lug.org.uk
Contact: Brian Ronald

18 LEICESTER
URL: www.leicester.lug.org.uk
Contact: Clive Jones

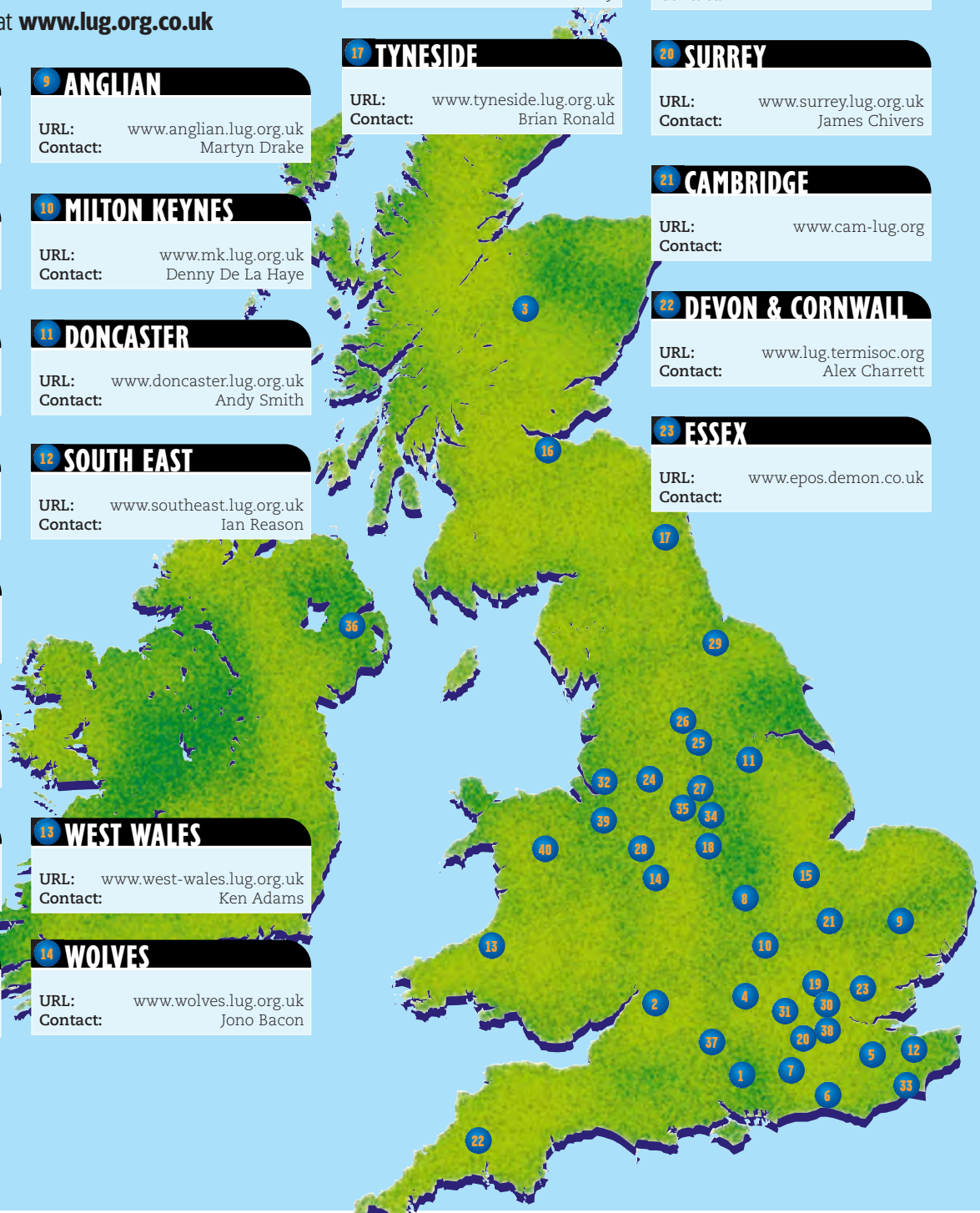
19 GREATER LONDON
URL: gllug.linux.co.uk
Contact:

20 SURREY
URL: www.surrey.lug.org.uk
Contact: James Chivers

21 CAMBRIDGE
URL: www.cam-lug.org
Contact:

22 DEVON & CORNWALL
URL: www.lug.termisoc.org
Contact: Alex Charrett

23 ESSEX
URL: www.epos.demon.co.uk
Contact:



USER GROUPS

24 MANCHESTER

URL: www.manlug.mcc.ac.uk
Contact: Ted Harding

29 NORTH-EAST

URL: www.shofar.freemove.co.uk/NELUG

34 CHESTERFIELD

Email: info@spirelug.org.uk
Contact: Paul Sims

39 CHESHIRE

E-mail: enquiry@sc.lug.org.uk
Contact: Richard Smedley

25 WEST YORKSHIRE

URL: www.scs.leeds.ac.uk/wylug
Contact:

30 LONDON

URL: www.lonix.org.uk
Contact:

35 SOUTH DERBYSHIRE

URL: www.sderby.lug.org.uk/
Contact: Dominic Knight

40 NORTH WALES

URL: www.northwales.lug.org.uk
Contact: Dr. Tim Traveres

26 WEST YORKSHIRE

URL: www.wylug.lug.org.uk
Contact: Nigel Metherngham

31 THAMES VALLEY

URL: www.sclug.org.uk
Contact: Nick Lambert

36 BELFAST (BLUG)

URL: www.belfastlinux.org
Contact: dannywalk@ntlworld.com

27 SHEFFIELD

URL: www.shelfug.co.uk
Contact: Richard Ibbotson

32 LIVERPOOL OpenSource

URL: linux.liv.ac.uk/LIV_LINUX_UG
Contact: Simon Hood

37 WILTSHIRE

Email: wiltshire@lug.org.uk
Contact: Jason Rudgard

28 STAFFORDSHIRE

URL: linux.ukweb.nu
Contact:

33 DEAL AMIGA CLUB

Email: superhighwayman@hotmail.com
Contact: John Worthington

38 SOUTH LONDON

URL: www.b-Lug.org
Contact: Dr. Tim Traveres

WORLDWIDE LUGS

AFRICA

STELLENBOSCH
Url: www.entropy.sun.ac.za/
Contact: Abraham vd Merwe
Email: ixion@entropy.sun.ac.za

AUSTRALIA

ADELAIDE LUG
Url: www.linuxsa.org.au
Contact: Matthew Tippet
Email: mtippet@anu.edu.au

MELBOURNE, VICTORIA
Url: www.luv.asn.au
Email: luv-committee@luv.asn.au

PERTH
Url: plug.linux.org.au

EUROPE

EIRE
Url: www.linux.ie
Contact: Ken Guest
Email: root@linux.ie

URL: www.dilu.org
Contact: Joe Lennon
Email: glossary@dilu.org

GHENT
Url: llsgg.rug.ac.be/
Contact: Wim Vandeputte
Email: wvdputte@llsgg.rug.ac.be

GOTHENBURG
Url: nain.oso.chalmers.se/LUGG/index.html

LISBON
Url: www.students.iscte.pt/~a12593/gul.html
Contact: Paulo Trezentos
Email: Paulo.Trezentos@iscte.pt

AUVERGNE
Url: www.linux-arverne.org/
Contact: Cyril Hansen
Email: Cyril.Hansen@wanadoo.fr

INDIA

Url: www.river-valley.com/tux/
Contact: K. Anilkumar
Email: anil@river-valley.com

Url: www.linux-india.org
Email: newsmaster@linux-india.org

NORTH AMERICA

ALASKA
Url: www.aklug.org/index.html
Contact: Dee McKinney
Email: deem@wdm.com

CLARKSVILLE, TN
Url: <http://www.cllug.org>
IRC: [#Linux](irc://irc.midsouth.net)
Email: tux@cllug.org

LOS ANGELES
Url: www.lalugs.org/
Contact: Dan Kegel
Email: dank@alumni.caltech.edu

BAY AREA
Url: www.balug.org/
Contact: Arthur F. Tyde III
Email: aftyde@balug.org

DENVER
Url: spot.elfwerks.com/~clue/
Contact: Lynn Danielson
Email: lynnd@ihs.com

TAMPA
Url: terrym.com/slug/index.html
Contact: Paul Foster
Email: paulf@quillandmouse.com

BATON ROUGE
Url: www.brug.net/
Contact: Dustin Puryear
Email: dpuryear@usa.net

LUG ORGANISERS!

If you're not listed here, or we have your details wrong, please contact us. It would help if you could write to us with the details listed below or fill in the form on our website at www.linuxformat.co.uk/LUGs

Name of LUG: _____

Location: _____

Contact Name: _____

Website address: _____

Any other information: _____

Send the form to:
LUGS!, Linux Format, 30
 Monmouth Street, Bath, BA1
 2BW, or email your details to:
linuxformat@futurenet.co.uk

VIRGINIA Tech
Url: corvette.me.vt.edu/pages/index.html
Contact: Bucky LaDieu
Email: nega@vt.edu

SOUTH AMERICA

SAO PAULO
Url: gul.linux.ime.usp.br/
Contact: gul@ime.usp.br

BUENOS AIRES
Contact: Daniel E. Coletti
Email: dcoletti@impost.com.ar

MONTEVIDEO
Url: www.linux.org.uy/
Contact: Rodolfo Pilas
Email: uylug@linux.org.uy

LIMA
Url: linux.unired.net.pe/
Email: linux@unired.net.pe

NEXT ISSUE



THE POWER TO RUN ALL YOUR SOFTWARE UNDER LINUX!

Emulation is the name of the game, and Linux is better blessed than most with scores of platform and OS emulation systems. Find out where this technology is leading us, and how you can run virtually any application under Linux in our next issue...

SPECIAL DVD ROM ISSUE!

As if that's not enough, we've pulled out all the stops to bring you another first – a DVD full of Linux goodies. Both CD and DVD versions of the next issue will be available.



PLUS!

We'll have reviews of IBM Business Suite, KDE Studio Gold, the latest in tape backup technology and a load more info on Kylix, plus a roundup of spreadsheet applications.

And more...

There'll be tutorials aplenty as we go into further detail on Perl and Java, and have a look at developing for KDE.

There'll also be some one-off tutorials. Plus we'll have your regular favourites, including Hot Picks, Answers and more.

The contents of future issues are subject to change. Due to random sunspot activity and other factors, life is never predictable, so don't blame us.



Issue 13 on sale Tuesday 27th March