

Pick up penguin

The increasing popularity of the Unix-flavoured operating system poses a real threat to Microsoft's crown. Here we look at seven leading Linux distributions with designs on your PC

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• Linux distributions tested and reviewed by Liam Proven with contributions from Roger Burton-West, Steven Lockhart and Mark Morgan Lloyd

In the past couple of years, Linux has become a significant contender in the PC operating systems market. Although Linux started circulating in the early 1990s, it is only now achieving sufficient maturity to be considered usable by non-experts.

As a Unix-like system, it's still best suited for servers, and it still requires a reasonable level of technical proficiency to run a system. However, several companies are working hard to make it as accessible as possible in order for it to be used as a general-purpose desktop OS.

One major way that Linux is different is that its various components are developed by different groups and companies, requiring someone to assemble these separate parts into a working whole. This is called a 'distribution', a selection of the producer's preferred components (the kernel, applications, utilities, etc), all tied together with configuration files and installation and administration tools.

Linux runs on everything from mainframes to wrist-watches, so there's plenty of room for customisation, and the various distributions vary radically in their focus, flexibility and ease of use. Some can fit onto a single floppy, or are dedicated to a specific purpose such as a router or firewall.

This month, we look at seven of the leading general-purpose distributions for Intel-architecture PCs. All are versatile enough to be servers, network clients or standalone workstations. All the prices in this group test are quoted from Linux Emporium (www.linuxemporium.co.uk) and include postage and packaging.

ILLUSTRATION EDDIE BOWEN: COSMOT.COM





Caldera OpenLinux eDesktop 2.4

THE ROOTS OF Caldera's distribution lie in Novell's Corsair project to develop a Windows-killer desktop Unix, and this shows in several ways. There is a bundled NetWare client that's Novell Directory Services (NDS) compatible, and an NDS-capable NetWare server is also available, although this is now rather out of date. Both are commercial closed-source products. OpenLinux also includes commercial components aimed at corporate use, such as a backup application (BRU), Citrix MetaFrame client and others.

OpenLinux has long sported some sophisticated features with which competitors are only now catching up. It was the first to offer an all-graphical boot sequence and installation. The LIZARD setup wizard is multitasking, copying files in the background while allowing you to configure sound, graphics adaptor, user accounts and so on. After this, there's a game of Pacman to play until everything's copied.

However, it also supports the old text-based setup and administration program, LISA, which remains a

useful way to configure networking, kernel and boot options and other parameters. Some LIZARD modules can be used after installation as part of COAS, a graphical system-administration suite, but, like SuSE, the older text-mode program is more capable. However, the superb browser-based admin tool Webmin is also preinstalled, which more than makes up for any deficiencies in COAS.

Installation is easy, with the CD booting straight into LIZARD, but this consistently hung on some machines – however, the supplied LIZARD boot disks worked flawlessly.

Windows users are very well catered for. The installation CD auto-runs under Windows, allowing you to make both LIZARD and LISA boot disks or install a limited version of PowerQuest's PartitionMagic to repartition your Windows drive for Linux. You can even start the installation from Windows.

PCI graphics, sound and network devices were auto detected, as was USB, but ISA equivalents had to be manually entered using LISA. The 2.2.14 kernel is now a little dated, and updating to a

newer version would improve hardware support. Along with many other patches and updates, recent kernel sources are available from Caldera's comprehensive online support site, which also features a recommended patch list.

Compared to some competitors, the OpenLinux bundle is quite basic. Caldera was one of the first distributions to adopt KDE (the K Desktop Environment, a graphical user interface for Unix) and still eschews Gnome and other window managers.



Installation of OpenLinux is made simple thanks to the multitasking LIZARD setup wizard

The system boots straight into KDE 1.1.2, with an all-graphical login sequence. When a user first logs in, 'Kandalf the KDE Wizard' runs and offers a choice of look-and-feel settings. The choices include normal, Windows-like, MacOS-like and BeOS-like.

It also adds icons for CD, floppy and printer. However, other than that, the KDE desktop is standard, right down to the rather cluttered and confusing application-launch menu. Unlike SuSE and Red Hat, there are no icons for Windows or other partitions.

The install CD contains a range of free applications, including word processors, personal organisers, bitmap and vector graphics editors, multimedia tools and more. There's also a Commercial Products CD containing StarOffice 5.1a, the Moneydance Java personal finance manager, a Citrix ICA WinFrame and MetaFrame client, CompuPic image management, backup/restore utilities and various other third-party products and demo versions.

As its name implies, OpenLinux eDesktop has a distinct client-side

focus. Like any Linux it can be used as a server, but Caldera offers two specialised variants for this – OpenLinux eServer, which includes additional functionality for building and hosting ecommerce sites, and eBuilder, which adds Evergreen's ECential 3.0 ecommerce toolkit. An eBuilder demo CD is included with eDesktop 2.4.

In contrast, eDesktop aims to be the best Linux web client. As well as the KDE browser (KFM) and various standalone tools, it sports Netscape Communicator 4.72 complete with a range of preloaded plugins – including Macromedia's Flash Player, RealPlayer 5.0, Adobe's Acrobat 4 viewer and an ICQ client.

The LIZARD installer has integrated modem detection and configuration via a customised version of the easy-to-use Kppp Internet dial-up tool, together with a selection of preconfigured ISP connection profiles – although controller-less 'winmodems' aren't supported. LIZARD also handles printer setup graphically.

Appropriately for its corporate target market, Caldera's release cycle is slower and more measured than some competitors and the company carefully vets all of OpenLinux's components. The result is a more stable system than, for example, the 7.0 releases of SuSE or Red Hat, but Caldera does sometimes lack all the latest bells and whistles that rivals feature. For the adventurous, though, there's a 'technology preview' edition, essentially a public beta with cutting-edge components.

It's not yet clear what the future holds for OpenLinux. Caldera recently acquired the OpenServer and UnixWare businesses of SCO, the biggest vendor of 'traditional' Unix on PCs, and the company has said that it plans to integrate its Linux technologies with SCO's commercial kernel. In the meantime, though, Caldera is a solid choice for businesses wishing to evaluate or deploy Linux, especially in a Novell environment.

It's also good for sharing a PC with Windows, for which the bundled PartitionMagic should prove very useful. For general home use, it's less compelling, with poorer hardware support and a relatively meagre range of bundled software.

DETAILS

★★★★★

PRICE £37 (£30.52 ex VAT)

CONTACT Caldera Systems

www.calderasystems.com

PROS Well-integrated, all-graphical system; Novell support; good backup

CONS Somewhat dated; modest software bundle

OVERALL A solid corporate desktop client with good after-sales support



Corel LinuxOS Second Edition

COREL LINUXOS IS a milestone product. For the first time, a major Windows application vendor has entered the operating systems market with a distribution specially designed for its existing type of customers. Corel's Linux is a Windows replacement, with several deliberately Windows-like features and supporting Windows applications, especially some of the stars of the company's own portfolio: WordPerfect Office 2000, CorelDraw 9 and PhotoPaint 9 (see box later in this group test).

The company has considerable Unix and Linux experience. CorelDraw had a Unix edition as far back as version 3.0, and WordPerfect has always been cross-platform. However, sensibly, it didn't start from scratch – LinuxOS is based on the non-commercial Debian GNU/Linux distribution. Indeed, some files still say Debian on them, such as the Apache webserver's default index page. While in development, the product was called Corel Desktop Linux (CDL) and this name still appears internally, along with the version number – this is really CDL 1.2.

Version 1.0 was launched with considerable publicity, which did mean that its problems got a lot of attention too – for example, it was unable to install into pre-existing partitions. A bug-fix version 1.1 was quietly released a few months later that fixed such major problems, but this new version is getting much more marketing push.

It's not surprising there were some bugs: this is a big change from Debian, a notoriously unfriendly text-mode system that, by default, has no GUI at all.

This is deeply hidden in LinuxOS, which is all-graphical from the boot prompt and loading sequence right through to its administration tools and shutdown screen – although the text-mode kernel messages do briefly appear as the system shuts down. LinuxOS provides a friendly graphical installer and a heavily customised version of the KDE interface.

The installer is the simplest we've seen on any version of Linux. It simply asks for a username, what to install and where to put it, then off it goes. Installation options are basic: normal desktop, desktop-plus editing and development tools, server or custom, which allows for individual package selection. There is a simple disk partitioning tool, which allows you to

use the whole disk or modify partitions, and, unlike the first edition, it happily installs into a pre-existing partition. We also tried upgrading an installation of 1.1, which was simpler still: the installer offered a single 'press to upgrade' button. The upgrade was successful, but left many menu entries non-functional.

Corel's desktop interface is a heavily-tweaked KDE 1. The panel, used for launching applications, and task bar, used for switching between running programs, have been merged into a single bar at the bottom. The launch menu's icon has changed, and KDE's normally rather confusing array of tools



LinuxOS SE enables you to install it into a pre-existing partition or to create a new one

has been simplified to Find, Help and Online Services menus, similar to those in Windows' applications.

KDE's browser-based file manager is gone, replaced by 'Corel File Manager' (as both icon and window are titled). This offers discrete volume-by-volume views of partitions and removable media, a printer list and Windows (Server Message Block) and Linux (Network File System) network browsing, all designed to make a Windows user feel at home. Like the Gnome file manager, it assigns icons to files by their MIME type. Other novelties are an improved KDE Control Centre, which uniquely can control XFree86, allowing you to change resolution and colour depth from within the GUI.

However, not all the changes are good. We couldn't find a way to edit the launch menu – a pity, since it included non-functional entries for programs not included in the default installation. There's no system administration tool to compare with Caldera's LISA, SuSE's YaST or Red Hat's Linuxconf, so we were unable to add devices that weren't auto-detected, such as an ISA bus Creative SoundBlaster 16 and NE2000-compatible network cards. The relevant configuration files contain stern warnings against editing them manually.

Although the online help is copious and well written, it only covers simple instructions on how to use the system, with no mention of adding hardware or editing menus. Similarly, the accompanying manual, though well-produced and readable, is just a guide to Corel's version of KDE.

Corel LinuxOS SE is available in both commercial 'Standard' and downloadable 'Lite' variants. The boxed version includes WordPerfect 8, PhotoPaint 9, the XMMS MP3 player, Acrobat Reader 4, Macromedia Flash 4, an ICQ client, Myth II: Soulblighter and some Loki games demos, Citrix and GraphOn clients, BRU backup software, more comprehensive help, a foot-tall inflatable penguin and a CD of the free version to give to your friends.

The Second Edition fixes many of the bugs of earlier versions, but doesn't repair deeper flaws such as poor customisation and the lack of useful administration tools.

It's a Janus of a distribution. If you have a modern machine containing only supported devices from Corel's hardware compatibility list, it is the easiest Linux around by far.

Conversely though, if it needs any modifications to fit your hardware or requirements, it reverts to one of the most arcane and inaccessible flavours going and you'll need the help of a friendly Debian expert to get it all working.

DETAILS

★★★

PRICE £42 (£34.65 ex VAT)

CONTACT Corel 0800 973 189

www.linux.corel.com

PROS Simple to install and user friendly; Windows-like

CONS Administration and customisation are poor

OVERALL Probably the simplest and easiest Linux around, but too limited in places



Debian GNU/Linux 2.2

IN 1993 DEBIAN was as a carefully-controlled distribution that would be made open, in the spirit of Linux and the GNU tools. It rose to prominence with the release 2.0 in 1998, with libc6 and 2.0 series kernels.

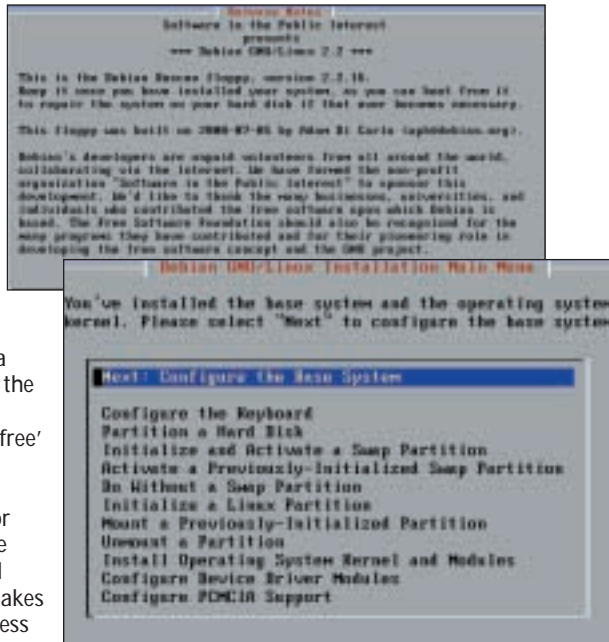
From the beginning it was a distribution for the technically adept – little effort has been put into graphical configuration tools, and the preferred method of tweaking a Debian system remains the editing of text configuration files. On the other hand, the software that has been written specifically for Debian – the package management system in particular – is extremely solid and easily meets the demands of unusual installations.

Debian doesn't include any commercial software with its distribution. Indeed, a significant fraction of the included software is relegated to the 'non-free' section, including anything that might require registration, or that doesn't allow free use, modification and redistribution. This makes using Debian in business environments very easy: simply exclude non-free and there are no commercial restrictions on what remains.

Starting installation is quite simple: you boot from a CD or floppies, and the installation proceeds the same way regardless of source – from local media, across a LAN or the Internet. The setup program is text-based and mostly driven using menus and dialog boxes. Network installs require you to know what sort of network card is in the machine, but the rest is quite easy.

Unlike most commercial distributions, though, hardware detection is minimal, and X Windows, sound support and so on aren't installed by default. There are package clusters that include these things, making an X desktop fast to install, but they aren't considered part of the core system, and it's straightforward to install without them. This keeps Debian usable on old, low-specification machines and has made it particularly popular for server installations. On the other hand, the lack of a default graphical desktop puts many people off using it as a desktop OS.

A noteworthy feature is the package-management system called APT, the Advanced Package Tool. Its great strength is the way it handles dependencies. To install the Apache webserver, for example, simply issue the command 'apt-get install apache'. This finds the latest version of Apache, works out all the components that Apache requires, finds the latest packages of these, and installs or upgrades them automatically. Installation can be from a CD-ROM, across a local network, or



Debian GNU/Linux 2.2 doesn't include any commercial software making it easy to deploy in businesses

directly from the Debian master servers by http or FTP.

Packages also contain version and conflict information, so upgrades are equally easy. If you point the Package Manager at the security update site, the simple command 'apt-get upgrade' will apply all security fixes. Configuration dialogs (text, dialog or graphical under X) are launched as necessary; incompatible packages are removed; and the user is kept informed of what's happening at every stage.

There's also a menu-based system, dselect, which uses apt-get as a back end, but it is easier for users who don't already know exactly what they're looking for. It also gives more information on recommended and suggested packages – ones that aren't strictly required, but are considered a good thing to have. For example, xlock depends on xlib6 and recommends libpam-modules (for password authentication); but it only suggests the fortune program, since this isn't a core part of its function.

Graphics, sound, network card, and so on can be auto detected, but there's no comprehensive system for doing this like Red Hat's Kudzu. Installing X is simply a matter of choosing the right server package for the machine's graphics card.

The default installation kernel is 2.2.17, with all standard drivers supplied as modules. However, USB support in this kernel series is minimal as it only really covers mice and keyboards.

If you want desktop environments such as Gnome or KDE, they are available, as are most of the other window managers. Most standard X packages are also present in the distribution. StarOffice is not packaged, due to its non-free nature, but will work quite happily on a standard installation.

Communications are very easy to get working: the Debian-specific pppconfig tool takes the user through modem and ISP setup. A firewall and packet filtering are available, though as in most of the rest of the distribution, only the command-line tools to control these are supplied.

There are normally two current versions of Debian available: a 'stable' version, containing known solid components, and an 'unstable' one, which always contains the most recent packages but has not been tested to full release standard.

Stable releases appear infrequently – once a year, or less – and updates are limited primarily to security fixes, which tend to be extremely prompt. If you want the latest versions of everything, you can use the unstable distribution. But you wouldn't want to blindly update a server to it, even though for the most part it's as good as other companies' 'final' releases.

Debian continues to grow: the unstable release 2.3 (codenamed Woody) is under active development and will be the successor to version 2.2 (Slink). It's also recently been used as the base for commercial distributions such as Corel LinuxOS and Storm Linux. These add graphical setup and configuration tools, but are not freely available.

DETAILS



PRICE Free download; £10 (£8.25 ex VAT) for six-CD source and binary set

CONTACT Non-commercial; developed by Software in the Public Interest

www.spi-inc.org

PROS Prompt security patches; free; excellent package management

CONS Not as GUI-based as other distributions, often not latest package versions

OVERALL Excellent for servers, good for desktops, not as 'easy' as other distributions

MandrakeSoft Mandrake 7.1

FIRST RELEASED IN 1998, Linux Mandrake started off as a version of Red Hat Linux 5.1. It was aimed at desktop users, with KDE integrated into it and was recompiled to take advantage of Pentium processors. But it has come a long way since then.

Codenamed Helios, version 7.1 has some interesting security enhancements as well as desktop optimisations that make it a distribution ready for everyday desktop use or as an easy-to-install server. It's still based on Red Hat, usually keeping track with the penultimate release, and as Red Hat is the most widespread distribution around, Mandrake is thus compatible with the many Red Hat-specific programs out there.

Linux Mandrake 7.1 comes on two discs in the freely-distributable GPL version. The standard boxed set includes a further disc containing applications (including StarOffice 5.2), additional partitioning tools and a library of electronic documentation. In addition, the boxed set contains installation and reference manuals and a boot floppy. A deluxe boxed set containing seven CDs is also available. We looked at the basic two-CD GPL version for this group test.

Installation can be done by booting from CD or floppy, launching from Windows 95, 98 or MS-DOS. Windows users can install Mandrake into a virtual disk contained within a single file on a FAT drive, avoiding repartitioning the hard disk, although the documentation states that this is likely to run slowly in comparison with a full installation.

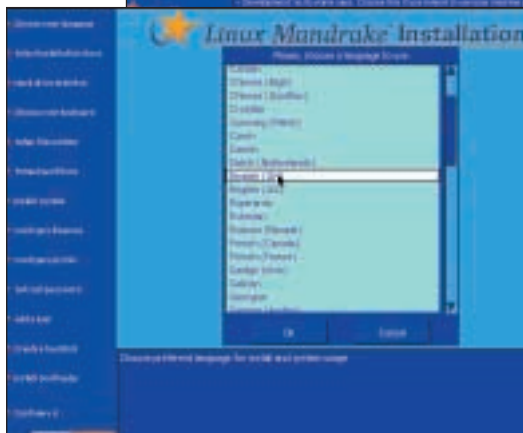
Mandrake's website claims that Mandrake 7.1 is the easiest Linux to install, and it's probably not far off the mark. It's one of the few distributions to correctly detect all the hardware tested, including, as desktop platforms, a Dell Dimension XPS T700r, with a Yamaha sound card, nVidia graphics and Intel Pro 100+ network card, as well as a do-it-yourself AMD K6-2 500 machine with SoundBlaster Live! Value sound card, Voodoo 3 2000 video and NE2000-compatible PCI network card.

However, under KDE, the start command for the KDE menu editor, `kmenuedit`, was broken, resulting in an error dialog claiming that 'The menu editor is not installed' – although it ran perfectly from the command line.

The installation offers a choice of normal, server or development installations, selecting appropriate

packages from the CD accordingly. Most distributions now offer a graphical partitioning tool, but Mandrake's is particularly good, with a clear display of allocated volumes – although it can be confused by complicated partitioning schemes.

The browser-based administration utility, Webmin, (www.webmin.com/webmin) is installed by default, as is the Postfix mail server, a fast, secure and easy-to-administer drop-in replacement for the ubiquitous Sendmail, which is also available on the CD.



Windows users can install Mandrake into a virtual disk contained within a single file on a FAT drive

Interoperability with Windows is good. The supplied DrakFont utility makes it easy to find and install fonts from an existing Windows installation. The WINE system for running Windows applications under Linux (see box later in the group test) is included, showing one of Mandrake's advantages over other distributions, and this works well with many Windows applications. We successfully used Ameol (the reader for the CIX online service), Quicken and Corel PhotoPaint.

WINE is still unfinished and won't run everything, but new releases come out early and frequently as Mandrake rpm packages (see Red Hat review). Of course, WINE-based applications intended for Linux, such as Corel PhotoPaint 9 and WordPerfect Office 2000, can also be run.

As a server, Mandrake 7.1 is good on security. The Mandrake Security (msec) application provides levels of security from level 0, 'Welcome to Crackers', up to level 5, 'Paranoid'. Depending on the security level selected, scripts are run which modify the system to restrict access and run occasional jobs to check and report on its integrity.

Mandrake's creators work hard at keeping it current and up to date. The website is quick off the mark with security updates and conscientious systems administrators keeping an eye on security advisories will welcome the single source of updates provided at www.linux-mandrake.com/en/updates/.

Depending on the view of the systems administrator, the inclusion of up-to-the-minute applications and early releases with Mandrake 7.1 either provides an edge in using the latest applications or presents a risk. But we found that stability was fine when using Mandrake as a live Intranet server, running Apache, MySQL, Postgresql and PHP applications. In fact it was as good as any Linux server.

Mandrake's attention to usability and user-friendliness can also benefit the system's use as a server. A good real-world example was an instance of a network card failure on a server system.

When the sysadmin replaced the network card, the first available spare was a different model. On bootup, Mandrake's hardware detection utility, Kudzu, detected the replacement card and automatically migrated the network settings. This resulted in reduced downtime, and no manual reconfiguration of network settings was required.

As a desktop platform, Mandrake 7.1 is excellent – fast, good-looking and stable. It favours powerful hardware – 128MB of memory or more is really needed to get the best from it as a desktop platform.

Although it wasn't available in time for review, by the time you read this, Mandrake 7.2 will be on sale. Expect it to be an improvement on an already excellent distribution.

DETAILS

★★★★★



PRICE GPL set, as tested £5 (£4.13 ex VAT); Boxed set £32 (£26.40 ex VAT); Deluxe set £56 (£46.20 ex VAT)

CONTACT MandrakeSoft
www.linux-mandrake.com/en/

PROS Excellent desktop; good security

CONS Relatively small software bundle

OVERALL Easy to install and use, this is an excellent distribution for home desktops



Red Hat Linux 7.0 Deluxe

RED HAT IS ONE OF THE oldest distributions around, and probably the most widely used, especially in the US. It was the first Linux for non-experts and the first to be based around packages – compressed bundles containing all an application's components, making it easy for the user to add, upgrade and remove individual subsystems in a single operation.

Its package format, RPM, named after the Red Hat Package Manager tool used to manipulate them, has become the industry standard, although not all distributions adhere to it – Debian's system offers better dependency tracking, for instance. As Red Hat is totally open source, others are free to take the entire distribution and adapt it, either porting it to architectures that Red Hat itself does not support (such as Cobalt's MIPS processor version), or even building new distributions based on Red Hat (such as Linux Mandrake).

This rigid adherence to using only open-source developments led to Red Hat falling behind some less rigorous competitors in recent years, with other companies developing graphical installation programs or building systems around the KDE GUI, which is based on a library, Qt, that originally was not open source. However, Red Hat is fighting back. It has its own graphical installer, Anaconda, and sponsors development of the all-open-source Gnome desktop. This remains the default, although now that KDE is totally open, it bundles that too and offers a choice.

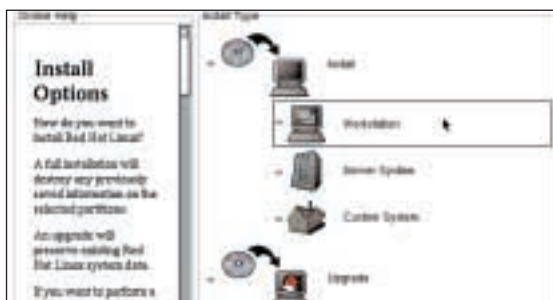
Red Hat also has a more strict numbering system for its releases than most companies. Major versions signify major changes in components systems – 6.0 introduced the 2.2 series kernels, and 7.0 uses XFree87 4.01 and updates the rpm database format. Point-one releases are bug fixes and contain minor changes – for instance, 6.1 introduced the graphical installation, but the text-based system was retained too. Point-two releases consolidate component updates and are generally the most stable and polished.

So what does this new release offer? Some new components are unfinished test versions, such as 'betas' of kernel 2.4, KDE 2.0 and Netscape 6.0 ('Mozilla'). There's also a significant new function, the Red Hat Network, a subscription-based online service for

automatically distributing software updates, including installation support by telephone and Internet.

The distribution itself comes on four CDs: two of runnable binaries, one of source code and one of documentation. Additionally, the Deluxe edition bundles six more CDs: StarOffice 5.2; 'Workstation Applications' (containing Acrobat Reader 4.05 and demo versions of VMWare and Applixware 5.0); 'PowerTools' (with more than 300 free applications such as Zope, Postfix and GNUcash); and games CDs (including demos of assorted Loki games and a full version of Railroad Tycoon II).

Installation is very smooth. The CD boots straight into the graphical



Red Hat is totally open source, enabling other companies to take the entire distribution for free and adapt it

installer, but you can also start it from a boot floppy or from DOS, and installation can be from local media or across a LAN or the Internet. The installer is easy to use, and offers a choice of either Red Hat's graphical Disk Druid or FDISK for partitioning. Then comes the type of installation that is simpler and clearer than in previous versions. First, you have to say whether this is a workstation, server or custom install, or an upgrade to an existing system. Later comes a choice of Gnome, KDE and games sets – which can all be used together if space permits.

The installer only configures the graphics card, mouse and keyboard – other devices, such as sound and printers, are left until later. This is

acceptable thanks to Red Hat's excellent device support. While it doesn't have as many drivers as SuSE, there are various helpful tools, including Kudzu for configuring plug-and-play devices, linuxconf for manual configuration of non-plug-and-play peripherals, such as network and SCSI adaptors, and sndconfig for sound cards. The latter even correctly configured our ISA SoundBlaster 16 when told to look for one, and Gnome automatically used it for sound effects in the GUI. This was covered in the 'Getting started' manual in previous versions, but now this contains more extensive coverage of using both the Gnome and KDE interfaces instead.

On one machine, configured with dual graphics adaptors, Red Hat 7.0 was unable to fully install.

The graphical installer filled the primary display with 'snow' and hung, while the text mode installer got to the very end before hanging – although it had created a working system by then. XFree86 4.01's multihead support is still very raw, and this configuration, which works perfectly with Windows 98, causes it to fail completely. Unlike SuSE 7.0, though, there's

no option to use XFree86 3.3.6 instead.

Red Hat 7.0 is a significant change from previous releases. Installation is easier and more flexible, supporting loading from multiple CDs. Support for the Gnome and KDE GUIs is nearly equal, and both can be installed together. However, as the point-zero version numbers imply, like SuSE 7.0 it's relatively unstable and not yet ready for prime-time use. For most users, we feel there's little value in including unfinished 'beta' code, and XFree86 is still a little raw, too.

We also would have liked to have seen version 1.4 of Gnome with Helixcode's improvements, even if only as an alternative to the stable Gnome 1.2 that is included.

DETAILS



PRICE £64 (£52.80 ex VAT)

CONTACT Red Hat

01483 300 169 www.europe.redhat.com

PROS Easier than ever; widely known and supported

CONS Poorer integration, features and user-friendliness than the competition

OVERALL Red Hat is the Linux baseline: if you're already familiar with it, or use products designed for it, it's still a sound choice, but other variants offer more

Slackware Linux 7

SLACKWARE IS WITHOUT doubt a classic example of all the Linux distributions. Largely unchanged for at least three years, it's probably the distribution that is closest to the classic Unix-style operating systems that were available on campus computers during the 1980s. In fact anybody who was weaned on the standard Unix books of that era will immediately be at home.

It shuns innovations such as the System V init structure, used by all other modern distributions, and package formats such as Red Hat's rpm and Debian's .deb. However, in other respects it's bang up to date with 2.2.x kernels and glibc libraries.

In addition to the kernel, development tools and basic utilities, it contains good support for TCP/IP networking, including the standard Internet services, a selection of character-based Internet clients, XFree86 version 3, a choice of window managers together with the Gnome and KDE desktop environments, plus some closed-source packages such as Netscape Communicator 4.7.

Despite the absence of frills, Slackware is a fairly good base for 'roll your own' distributions – it's the basis of the tiny Pygmy Linux distribution, which runs its 20MB of code into a DOS directory, as well as Quatermass Research's

Linux Secure Server Distribution (LSSD).

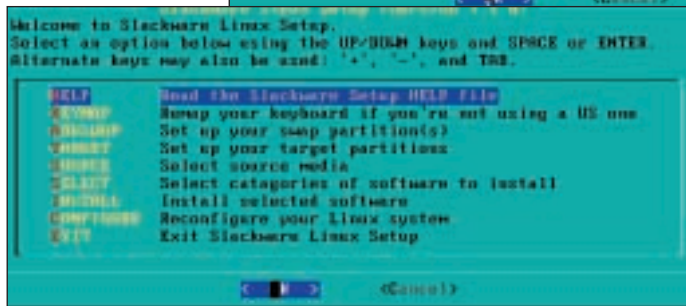
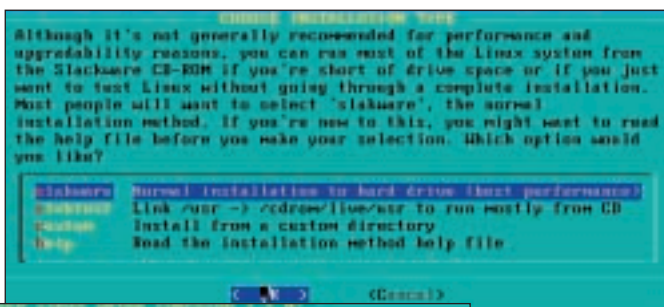
Like Debian, its hardware requirements are modest. You should be able to get it to run on any system with more than 4MB of RAM and a 50MB hard disk, although the experience may not be pleasant.

Two noteworthy points are that as part of the standard installation process it's usual to make up a pair of floppies ('boot' and 'root'), which will actually contain the majority of utilities needed for basic maintenance of a broken system. In addition to this, most programs come with the exact source that was used to compile them – in other words, all the configuration files are set up to generate precisely the same executable as was installed when the system was first loaded.

However, this flexibility comes at a price. Installation is orchestrated by an interminable sequence of checklist screens, and these have immediate effect

rather than building an installation script. Therefore, if you get something wrong, you can't backtrack, and if you install something you really don't want – well, it may be safest to start over. Similarly, the recommended way of setting up the local X server is to use the venerable xf86config utility and, while it's usually possible to get X working, anybody reared on Windows or even OS/2 will find the experience totally disheartening.

The supplied kernels tend to be fairly minimal. Any extra facilities, such as PC Card support, are loaded as modules, which often means editing one of the rc scripts. Thankfully, most modules are able to locate the hardware, although



Unchanged for at least three years Slackware resembles the classic Unix-style OS found on campus computers in the 1980s

there are cases (eg some SCSI cards) where parameters must be supplied. However, if this is a failing, it's a shortcoming of the underlying kernel rather than any particular distribution. It's usually possible to 'patch in' newer devices, although this has to be approached with caution and isn't really a job for the rank beginner.

Development tools include C, C++, FORTRAN, Lisp, Perl, Python and Tcl/Tk, with the usual variety of alternatives from various Internet sites. We were extremely surprised to find a Modula-2 implementation, which compiled, installed, ran flawlessly and generated code that could be debugged using the standard GNU debugger.

A variety of X development libraries are bundled, but the star of the show has to be the KDE desktop, particularly as this uses the same Qt widget set that will be in Borland's eagerly awaited Kylinx environment. The WINE and

dosemu emulators are conspicuous by their absence.

In practical terms, most users who choose Slackware these days are likely to want it as a platform for a server environment. The standard distribution includes Apache, sendmail and INN, together with their supporting cast. There are also downloaded open-source applications, such as PostgreSQL and OpenLDAP, which compile and run without problems, and there is an increasing choice of commercial offerings such as Lotus Domino, IBM DB2 and Oracle. However, extras such as Secure Sockets or Kerberos authentication need to be grafted onto the system with care and this is made more difficult by limited support for the rpm distribution format.

The usual Unix-style text processing tools – including Emacs, troff, LaTeX (but not LyX or Klyx), Ghostscript etc – are bundled, but not StarOffice or ApplixWare. Anybody who

believes the claim that a word processor and spreadsheet are included is likely to be very disappointed.

Slackware adopted KDE only recently (reputedly because it was unhappy about KDE's licensing terms) and may have lost a substantial number of users due to the deficiencies of the window managers supplied with the previous 7 releases (confusingly, version 7 was preceded by v3.9).

However, KDE works fine as a GUI, although obviously its support for sound depends upon correctly configuring the kernel for whatever card is installed.

Slackware's low-level accessibility, customisability and simplicity, together with its growing selection of recent applications, should help it retain its position in the market. But it will never be the trendiest kid on the block.

DETAILS

★★★

PRICE £23 (£18.98 ex VAT) without manual; £38 (£31.35 ex VAT) with manual

CONTACT Walnut Creek CD-ROM

www.slackware.com

PROS Robust implementation with very few bells and whistles

CONS Very much a classic character-mode distribution

OVERALL Excellent for server applications and development, but not for the desktop



SuSE Linux 7.0 Professional

SUSE LINUX IS ONE of the best-selling distributions in Europe, partly because it's so comprehensive. It includes 1,500 applications – everything you could need, from productivity applications to emulators and programming languages – filling six CDs, although a DVD is also included.

This includes a host of GPL (GNU general public licence) software, including substantial applications like KOffice, AbiWord, StarOffice 5.2, Netscape 4.73, RealPlayer and Adobe Acrobat Reader 4.0. There are also demo versions of leading commercial products, such as VMWare, IBM ViaVoice, the ADABAS D database, Arkeia backup, Lutris' Enhydra 3 XML/Java application server and Hummingbird's Exceed X server for Microsoft Windows. Multimedia support includes MP3 and MOD players and both the OSS and ALSA sound systems, covering most sound cards.

This huge bundle is ideal for users with metered Internet access, as it saves you a lot of downloading. It's also regularly updated – version 7.0 includes version 4.0 of XFree86 and late 'beta' versions of KDE 2.0 and kernel 2.2.17. Recognising that not everyone needs all this, SuSE has released a Personal Edition of Version 7.0, which provides just the major desktop packages on three CDs.

Although it doesn't have frills such as the graphical boot sequences of Corel and Caldera, the SuSE installation sequence boots from CD, DVD or floppy straight into the YaST 2 graphical installer. This then takes you gently through the setup process using a simple wizard-style interface. However, the older text-based YaST 1 program is still supported, and it can be used simply by booting from CD 2 instead. It's also used when upgrading an installed system.

A complete installation takes a whopping 6GB and includes KDE 1.1.2, KDE 2.0pre (as SuSE calls it – it's really version 1.92) and Gnome 1.2 (as well as more traditional window managers). By default, SuSE boots straight into KDE 1's login manager, allowing you to choose your preferred desktop environment from a dropdown menu. Both KDE and Gnome desktops are neatly preconfigured, with desktop icons for all readable disk partitions and removable drives and a welcome screen with links to online documentation and Internet resources.

By default it uses older, stable versions of the kernel (2.2.16) and XFree86 (3.3.6), but it's easy to change to the new XFree86 4.0 – you just run the SaX2 configuration tool. On supported configurations, such as dual-head or multiple identical Matrox cards, XFree86 4.0 supports multihead operation. It also supports 3D acceleration for ATI, nVidia and the Diamond FireGL cards, the latter exclusive to SuSE's version.

Unfortunately, it rendered the system unusable on one test machine configured with two different graphics adaptors. A bug-fixed version 4.01



SuSE Linux features 1,500 applications filling six CDs, including demo versions of leading commercial software

shipped shortly after 4.0, but too late to be included with SuSE 7.0.

Other improvements from the previous version include better hardware support, covering UltraDMA100, Adaptec RAID controllers, new TV cards, USB devices including ISDN TAs, Zip and floppy drives and H.323 video-conferencing. The Professional edition now includes Java 2 and 90 days' installation support, up from 60 days, as is still included with the Personal Edition.

In addition to x86 PCs, SuSE now also supports Alpha and SPARC workstations, PowerPC Apple Macintoshes and compatibles, and – remarkably – IBM System/390 series mainframes. However, these versions don't include some components that are only available for Intel-architecture processors.

A major change is support for the Reiser journaling filesystem, which is

highly resistant to disk corruption and so protects you from data loss. The installation program recommends this instead of Linux's standard ext2 format, and SuSE includes the ability to boot from a ReiserFS partition. It's useful for a server, but for client machines, ext2 is more compatible with other distributions and can be manipulated by other systems, such as PartitionMagic and BeOS.

Hardware detection is good, with most PCI devices being found and configured automatically by YaST2, which can be run after installation, unlike Red Hat and Corel's setup tools. However, it's not perfect. It found, but failed to configure, an ESS Maestro2 PCI sound card, and ignored an ISA Creative SoundBlaster 16, which couldn't even be added manually. It also missed an ISA NE2000 compatible Ethernet card, but this was added using YaST 1 instead.

Reading reports of botched upgrades on the CIX online service, we installed a clean copy of the previous version (6.4) and upgraded it to 7.0.

Although the upgrade was successful, it rendered the Apache webserver inoperative by over-writing its configuration files. However, an upgrade of a fairly minimal SuSE 6.1 system went flawlessly. We suggest taking a full backup and proceeding with caution.

SuSE is remarkably comprehensive, but with so many components and new versions several times a year, it's almost too much. This version is in places still too raw – we experienced problems with several parts, including the KDE 2 beta

and XFree86 4.0. We'd prefer to see XFree86 4.01 at least and KDE 2.0 – or even 2.01 when that appears.

Future versions will doubtless include other novelties such as Helix Gnome and the imminent kernel 2.4. For now, SuSE 7.0 is a step too far for serious use, although it's fine if you just want to experiment.

DETAILS

★★★★

PRICE £58 (€47.85 ex VAT)

CONTACT SuSE Linux 020 8387 1463

www.suse.co.uk

PROS Vast range of software included;

excellent driver support; good manuals

CONS Some unstable components; high disk space requirements

OVERALL Great for experimenters and those with restricted Internet access, but serious business users should stay with 6.4 for now

Emperor penguin: Running the server

The market for workstations is much larger than that for servers, and as the desktop is what most users are interested in, that's where the high-profile Linux vendors concentrate their efforts.

However, Linux is a Unix-like OS, and Unix has traditionally been a server system. So how does Linux shape up as a server?

In recent years, the mainstream commercial Unix companies such as Sun, IBM and Hewlett-Packard have largely abandoned the lower end of the market.

Powerful PCs now make more than adequate servers, typically running Novell NetWare or Windows NT Server. However, these systems are expensive and require paid licences for each user or machine connected to them.

Linux fits in neatly here. While both NT and NetWare support TCP/IP and can act as

Internet gateways, this requires additional software – and more expense. Many companies are also reluctant to connect their core servers directly to the Internet. In contrast, Linux comes out of the box with an extensive range of Internet software.

Everything's there to connect to the Internet via modem, ISDN or a permanent connection, to act as a firewall with NAT (Network Address Translation), to send and receive email, to serve web pages and act as a caching proxy server. This works well with MacOS, too, and any other Internet-aware client OS.

It's relatively simple to set up a Linux machine to connect a Novell or NT network to the Internet in this way. It's a very

cheap way to do it and, as the gateway doesn't require a GUI and can be managed remotely from a workstation, it only requires a modest PC – a decent 486 or slow Pentium.

By default, most



3Com's Internet Server uses a Linux operating system

distributions are pretty secure, and fixes for security issues appear quickly.

Similarly, it's straightforward to configure Linux to

act as a fileserver for Windows clients. Printer support is slightly more tricky, as many modern printers are Windows-only devices. Linux is stable even under a heavy load and easily handles long file names and secure multi-user access.

However, compared to purpose-built Network OSs, like NetWare and NT, Linux lacks polish. It doesn't include niceties such as support for roaming desktops, backup and performance-monitoring tools, anti-virus scanners and so on. Its security model and documentation are more aimed towards serving networks of Unix clients, and its support for high-end hardware, such as quad-processor servers and more than 1GB of RAM, is also poor (though it's improving fast). For now, it's best as a supplemental server.

Windows licker: Controlling the desktop

The first axiom of business computing used to be, 'find the applications you need, then buy whatever they run on'. Now, however, almost everything runs on Windows, and that's the baseline against which other platforms' applications are compared.

Historically, though, Unix software has been rather different. Unlike consumer applications, Unix programs were specialised, expensive products for very specific functions, such as CAD or mathematical modelling. Many of these were ported to Linux early on, but they remain costly, and often look dated and unfriendly compared to mass-market competitors. However, as Linux encroaches onto the desktop, this is changing.

First, the open-source community is tackling the problem with gusto. The KDE and Gnome desktop environments provide a complete infrastructure for developing friendly graphical programs. Their libraries and programming environments make it easy to use facilities



such as toolbars, standard dialog boxes and online help. What's more, with the relevant runtime libraries installed, KDE applications run happily under Gnome and vice versa.

This is resulting in an explosion of desktop applications, from standalone applications such as the AbiWord word processor, gNumeric spreadsheet and GIMP image editor, to complete office suites such as KOffice and the now open-source StarOffice. There are plentiful net tools such as browsers, clients for email, news, chat and FTP, download managers and more. Early 0.x versions are common and

Corel has created Linux versions of most of its software range

documentation may be scant, but they're usable.

More specific tools are somewhat rarer. It's possible to connect Palm and Psion PDAs, but not as easily as on Windows or MacOS. Multimedia players for standard formats like MP3 are common, usually available as clients for peer-to-peer filesharing services such as Napster, but proprietary standards such as RealPlayer and Macromedia Flash are only just appearing – and often only for Intel platforms.

Games support is improving fast. Version 4 of the XFree86 X server has 3D acceleration for selected cards, and Mesa provides OpenGL

compatibility. Companies such as Loki are porting popular Windows titles, although these do lag behind the original versions – for example, Sin, which was released in 1998, has only recently appeared.

For titles that are unlikely to be ported, help is at hand. One Windows vendor, Corel, is moving its range of Windows applications to Linux. However, it's not doing this by slow and costly fully native ports it's using WINE.

Despite its name (a contraction of Windows Emulator), WINE is not an emulator. It allows Windows programs to run under Linux, by converting Windows API calls to Linux equivalents on the fly. It's far from complete, but it works, and some applications and even complex games such as Unreal Tournament are already usable on Linux with WINE. Corel supplies special Linux versions of WordPerfect Office 2000, CorelDraw 9 and PhotoPaint 9, which have been modified to make them work better in the environment.



Editor's Choice

Open-source products tend to be updated more quickly than commercial, closed-source ones, as their development is an ongoing process. In principle, anyone can submit a revision, fix a bug or add a new feature at any time. There's no business model driving a requirement for 'finished' products that can be boxed up and shipped out.

A Linux distribution isn't an open-source product, though. It's a collection of hundreds of them, sometimes together with a sprinkling of closed-source or commercial components. Each distribution just represents a snapshot of the state of its various parts, and these may not all be maturing at the same rate. The result is that different versions of the same distribution can vary widely and the 'best buy' change from one month to the next.

This isn't as bad as it might seem. The core of Linux is all free software, so most distributions have a freely distributable version, which you can download from the web as an ISO image ready to be burned onto a CD-R. Don't worry if you don't have a CD writer, or don't like the thought of downloading multiple 650MB files. This freedom also means that other companies can download these images onto CDs, which they can then sell for a nominal charge: such discs are typically available for about £2 each plus postage and packing.

One such specialist supplier is the Linux Emporium (www.linuxemporium.co.uk), which also supplies keenly priced boxed sets of all the major distributions. These are obviously more expensive, but you get all the additional

CDs, printed manuals and usually some bundled support to help you get the system up and running. All the street prices in this group test were provided by the Emporium.

The upshot of this is that you can try before you buy. If you have the time and patience, it's cheap to evaluate all of these distributions in their free forms, allowing you to choose one that suits you before spending £30-£40 on the full version. But which are most worthy of your consideration?

The winners

Red Hat Linux 6.2 (reviewed in *PCW* August 1999, p128) was a solid version, if lacking some of its competitors' bells and whistles. Version 7.0 catches up with many of these features, with a polished installation, good support for KDE as well as Gnome, and a comprehensive software bundle. However, it suffers in terms of stability.

The story is similar for SuSE Linux 7.0, which is the most feature-rich Linux we've seen. Although Red Hat Deluxe has 10 CDs to SuSE's six, the latter is crammed with goodies, while Red Hat includes several volumes provided by third parties, which results in more discs. However, both are still worth a look. That said, we feel that version 7.0 isn't trustworthy enough for use on a live system, although it's fine if you just want to explore.

Caldera, Debian and Slackware all take the opposite approach. These are relatively staid, corporate distributions – they don't pretend to support all the very latest features, concentrating instead on tried-and-tested components.

While Slackware and Debian are rather old-fashioned, text-mode systems for Linux experts, Caldera is a remarkably polished and professional all-graphical system that's equally suitable for the novice, although some technical knowledge will still help. Its business focus will suit corporate IT types who wish to evaluate Linux for deployment on their internal systems. Its separate server and workstation variants makes **Caldera OpenLinux** a solid corporate choice, which is why it receives the **Highly Commended** award.

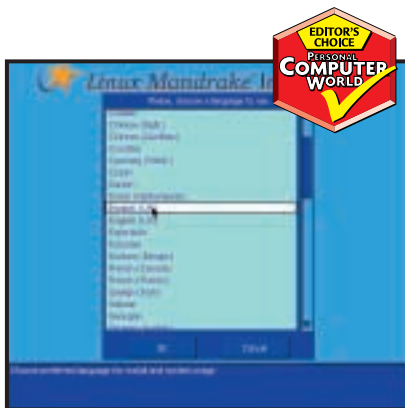
Corel's LinuxOS is by far the simplest and easiest Linux around – when it works. Unfortunately, it's still very immature and has major holes: it desperately needs better hardware management and system administration tools. If it can handle all the hardware on your system, or you can live without luxuries such as sound and networking, it's a good beginner's system.

Which leaves Mandrake. This aims to be the best of both worlds, taking Red Hat's technical strengths and wide industry support and giving it a friendlier face. **Mandrake Linux 7.1** gets the **Editor's Choice** because it is the best balance of simplicity and functionality of all the distributions on test.

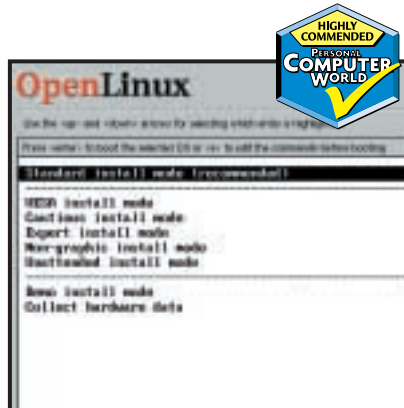
The first thing you see is Mandrake's own quirky penguin, who dons goggles and a snorkel to offer help if you're out of your depth. Although there are occasions when the translation of the French menus and prompts is a little idiosyncratic, it's always helpful.

The installer's checklist approach makes it very easy to jump back to an earlier point in the installation if you change your mind about something, beating the other distributions' wizards, which require you to retrace your steps.

The KDE interface is currently more complete and feature-rich than Gnome, and Mandrake's version is the best we've seen. Taking Red Hat's first-class text-mode administration tools it adds several accessible graphical ones to help GUI users, complete with desktop icons and pop-up tool tips. For busy system administrators, there's remote administration via Webmin and regular updates and security alerts. The documentation is good, and the boxed edition, which is sold by Macmillan, adds CD editions of several Que and Sams reference books.



Mandrake Linux 7.1 is the best balance of simplicity and functionality available



Its server and workstation variants makes OpenLinux a solid corporate choice