

Roundup

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



Looking for a lightweight Linux for an old machine? Mike Saunders dives into a pile of distro CDs and picks the best...



Question: you've got an old Pentium box sitting in the cupboard, offering only 32 megs of RAM and running Windows 95 – what can you do with it? Ye olde Windows is adequate for the apps and games of yesteryear, but it could be doing more. Much more! You could throw BeOS or FreeDOS on it and experiment with niche OSs, you could shoehorn in a Debian or BSD installation and convert it into a server... or you could try a mini Linux distro and give it new life as a desktop box.

This is one of open source's great strengths. The modular design of Unix/Linux, coupled with thousands of coders striving to wring every last CPU cycle out of their hardware, leads to slimline alternatives for nigh-on every app. Mini distros bundle all these alternatives together for the millions of low-spec boxes still in use worldwide.

So what makes a good mini distro? Some of the key factors:

■ **Installation** Snazzy graphical installers have to be avoided in favour of text-based equivalents, but these can still be welcoming and effective if designed well. Having some config

tools to use instead of hand-hacking at the CLI is a bonus.

■ **Desktop** Gnome and KDE aren't an option here;

they're simply too demanding on disk space and memory. A sensible choice of window manager for mid-spec boxes is *Xfce*, while *IceWM* and *Fluxbox* work like a charm on very old machines.

■ **Performance** Naturally, making the best possible use of a low-end system's scant resources is essential. But some functionality will have to be dropped to keep requirements small. Boot speed is also worth noting.

■ **Applications** Hefty beasts like *OpenOffice.org* are a no-go, but *AbiWord* and friends will serve just as well. Similarly, for a general-purpose

OUR SELECTION AT A GLANCE

Damn Small Linux	35
Feather Linux	38
INSERT	36
muLinux	38
Puppy Linux	37
ZipSlack	36

desktop it's important to have a wide range of apps.

This month we've looked at six of the most useful mini distros, examining the points above and judging their overall ability to give PCs of yore a boost. Our main test box for these mini distros is a Pentium II 266 MHz with 64MB of RAM. We've also tested the distros on an additional machine to confirm hardware detection routines and the boot-up speed.

They're all on our coverdisc ready to try – so without further ado, let's see how they fared...

Damn Small Linux

Deservedly the most popular mini distro.

■ VERSION 0.93 ■ WEB www.damnsmalllinux.org ■ PRICE Free under GPL

The name sums it up perfectly: no buzzwords, no pretentious slogans, no ambiguity – it's just Linux, and it's Damn Small at that. Typically referred to as DSL (except in networking discussions, when it all gets a bit complicated), this is the most famous mini distro, having built up a bustling online community and a handy range of add-ons. There's even an online DSL shop now, offering pre-installed USB pen drives along with Mini-ITX mobos, ideal for portable DSL hardware. The 128MB USB key is pretty good value at \$48.

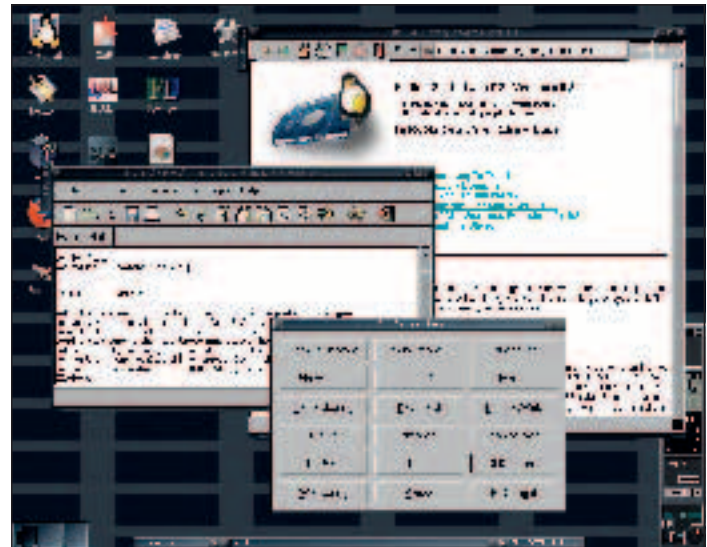
Although it's a Live CD, which enables you to run Linux without touching the hard drive, DSL includes tools and scripts for installing it as a full-time OS. The developer's decision to base DSL on Knoppix is wise – it inherits the hardware detection and versatility that has made Knoppix so famous, along with its Debian pedigree for extra stability. Great stuff. In addition to the hard disk install, DSL sports some rather neat tricks in the

form of USB keys and the *QEMU* PC emulator: you can fire up Linux on any Windows box without even a reboot.

The latest DSL ISO image weighs in at a floaty-light 50MB, and the team plan to keep it this way (making sure it always fits on to business card-sized CD-Rs). There's no one-stop installation process; you have to boot it in live mode first, and then run the install scripts, which pop up a few questions, and copy the files over. These also assist in setting up a bootloader. Sadly, though installation is not brain-bendingly difficult, it does require some manual disk partitioning (courtesy of *fdisk*) and entering device names – tasks that could flummox novice users.

Kaleidoscopic

DSL boots fairly swiftly, with a kaleidoscopic display of colours that regular Knoppixers will recognise, and does a fine job of detecting hardware. The whole distro fits into 129MB of disk space. Most *XFree86* video drivers



DSL's stock Fluxbox desktop, with the config tool launcher up front.

“DSL'S DEVELOPERS HAVE HAND-PICKED APPROPRIATE APPS THAT PROVIDE FUNCTIONALITY WITH LITTLE WASTE.”

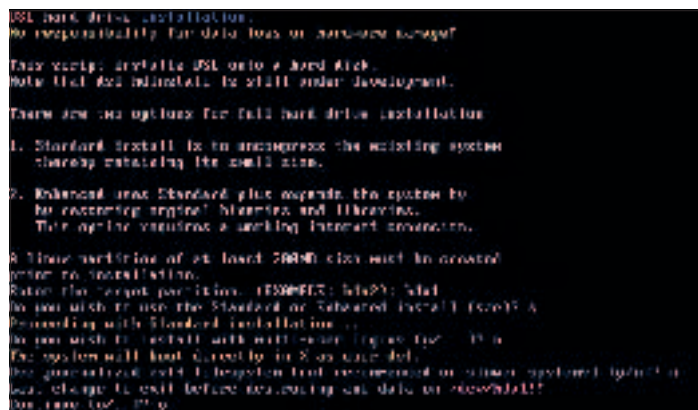
have been omitted for space reasons so you're limited to VESA or the framebuffer modes, which isn't a major concern (dedicated drivers can be added post-install). It's all very polished and refined.

DSL's choice of *Fluxbox* as the lightweight window manager will get the thumbs-up from most users. Although it's somewhat different from the commonplace Win9x-ish layouts, *Fluxbox* is ultra-minimal in terms of screen space and takes little learning – plus the online help gives pointers to basic use. A few applets have been dropped into *Fluxbox*'s slit for mounting drives and keeping track of CPU and RAM usage, while the neat little control panel, which fires up some no-frills graphical config tools, is an especially useful touch.

Emelfm, the default file manager, is a decent selection – its familiar two-pane view and feature set accompanies the WM well. Excellently, most of the light apps have heavier alternatives, so the zippy little *Dillo* browser can be switched to *Firefox*

where there are more resources. Email is catered for with *Sylpheed*, *Naim* is supplied for chatting, there's *XPaint* and *xzgv* for image editing, while office tools are provided in the form of *Siag* and *Flwriter*. A whole host of tiny utilities has been thrown in too.

In all, DSL excels at its job: it's fast, the hardware detection is exemplary, and the range of software works well (most packages are up to date). Unable to accommodate giants like *OpenOffice.org*, DSL's developers have hand-picked appropriate apps that provide essential functionality with little waste, and tricky configuration tasks are explained for novices. Some areas could do with a bit of spit-shine – but all round it's superb.



Installing to hard disk isn't painful with the helpful script.

EXTRA PACKAGES

Although DSL's Debian underpinnings mean that *apt-get* can be enabled with some fiddling, the developers have also prepared an extensive range of extra packages using their MyDSL system. These are packages purposely built for DSL that can be downloaded from the net and installed as the distro is running or added to the CD image before rewriting.

There's a satisfyingly thorough range of packages with recent releases.

For productivity software, *AbiWord* and *OpenOffice.org* are available (the latter nowhere near lean enough for most old systems), along with *Gimp*, *Audacity*, *MPlayer*, *Gaim*, *Pan*, *Thunderbird* and heaps of others to help turn DSL into a fully-fledged system. Some of these are lagging behind – they're typically several months older than the latest versions available – but are great bonuses nonetheless. Crucially, they help to keep the main ISO trim.

LINUX FORMAT VERDICT

Stability, speed and the right balance of apps make Damn Small Linux the bee's knees of mini distros.

RATING **8/10**



ZipSlack

Miniature version of the classic Slackware.

■ **VERSION** 10.1 ■ **WEB** www.slackware.com ■ **PRICE** Free under GPL

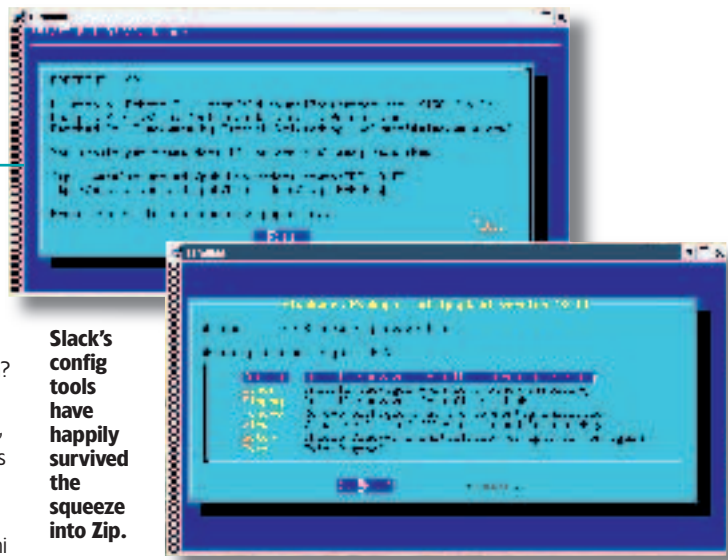
Trimming down a distro to only the most vital components is an excellent way to learn the workings of Linux, but it's also fraught with danger – delete the wrong file and you're well up a certain creek with no hope of a paddle. ZipSlack, as the name suggests, is a smallified version of Slackware that fits into 100MB, thereby making it useful for low-spec machines or Zip disks (which don't see much use nowadays). Slackware itself is a highly mature and respected distro with bags of stability.

To avoid the complexities of partitioning, ZipSlack can be extracted onto a DOS disk; this uses UMSDOS to bridge the gap in filesystem features. It's ideal for learning about Linux without making dedicated space for it. Once you've got it in place, running *LINUX.BAT* starts up LOADLIN, which in turn fires up the kernel – and you're

straight into a working distro. The extracted archive needs only 89MB of space so there's still room for personal files on Zips.

So what has been trimmed, then? The first thing you'll notice is that a flavour of *X* is missing from ZipSlack, with only console apps included. This is understandable considering *XFree86*'s size, although it'd help to have a slimline version (as other mini distros have used) as a quick start. Adding *X* from Slackware's packages is easy, though. On the software front, the *Midnight Commander* file manager, *Links* browser and *mpg321* music player are joined by *OpenSSH*, *Elvis* (a *Vi* clone), *bsd-games* and others for a fleshed-out base system. Despite the absence of a GUI, then, ZipSlack is very usable.

But what does it offer over other mini distros? It doesn't provide an



Slack's config tools have happily survived the squeeze into Zip.

immediate out-of-the-box experience like DSL or Puppy, reviewed right, but on the upside it's extremely easy to expand and tweak thanks to the Slack software archives – you can pick and choose apps to match your exact hardware spec. The icing on this already tasty cake is Slack's performance and reliability: it's one of the longest-running distros around and includes only well-tested software.

This should make your shortlist if you're willing to tinker and learn about Linux in general.

LINUX FORMAT VERDICT

It's text-mode only (although adding *X* isn't hard) and best for experienced Slack-fans.

RATING **6/10**



INSERT

A helping hand when disaster strikes...

■ **VERSION** 1.217 ■ **WEB** www.inside-security.de/insert_en.htm
 ■ **PRICE** Free under GPL

One area in which mini distros and Live CDs excel is system recovery and maintenance. After a catastrophe, particularly with hard drives, it's possible to boot from CD and

(hopefully) restore the system to a sane state. INSERT, the Inside Security Rescue Toolkit, aims to clean up broken systems with a variety of tools – plus its overheads are pleasingly

minimal too. It's not as desktop-focused as the others on test here, but includes a basic GUI and deserves a look for its feature set.

INSERT's 50MB ISO image is the appropriate size for dropping on to business card CD-Rs. As with an increasing number of mini distros, it's built on robust Knoppix foundations, so hardware detection and stability is tip-top. INSERT's developers hope to make the distro installable on USB keys in future releases, which should allow on-the-spot changes and file transfer.

Once booted, INSERT pops up a bright *Fluxbox* desktop accompanied by several applets in the slit (memory and CPU load, disk mounting and so forth). Usefully, the supplied web browser – a *Links* flavour – starts up automatically and supplies various tips and guides. So, although you'll need some Unix experience, in general it's not too difficult to get started.

INSERT bundles an array of tools and utilities that focus on Windows systems: partitioning software, *ClamAV*

for virus scanning and NTFS support via the Captive driver (this uses genuine Windows components for full read/write access). A wealth of other filesystems are catered for too – including all the popular Linux options, Mac partitions, and more – and *GtkRecover* can retrieve deleted ext2 files. Networking tools include *portscanner:nmap*, SSH and Telnet for remote logins, *ettercap* and the *axyftp-gtk* FTP client.

Chkrootkit and *Rootkit Hunter* provide some repair tools for compromised Linux boxes, and on the whole it's a decent range of software. INSERT isn't an ideal mini distro for desktop use; but it's well worth keeping a copy around for emergencies. Good work.

LINUX FORMAT VERDICT

Not for day-to-day use, but a godsend when a box needs repairing pronto.

RATING **6/10**



A pretty bare desktop, but there are stacks of repair and testing tools.

Puppy Linux

Next month: Kitten Linux vs Budgie Linux.

■ VERSION 0.9.8 ■ WEB www.goosee.com/puppy ■ PRICE Free under GPL

If **Damn Small Linux** wins a prize for the most straight-to-the-point mini distro name, Puppy Linux deserves a small medal for the cutest title. The canine theme only extends as far as the project's logo, though; it's not adorned with sickly-sweet puppy images throughout. Here, the overall goals are ease of use and working out the box with no hassles, a mission helped considerably by the selection of modern apps. Early releases of Puppy were very strict on the types of program supplied, but this policy has been relaxed and the inclusion of *GTK 2* brings many more goodies.

Thanks to CramFS (a loopback-mounted filesystem that's uncompressed on the fly), Puppy Linux will boot on Pentiums with 32MB of RAM, although to run some of the larger apps a swap partition is recommended (automagically detected if already present on the system). The ISO itself clocks in at just 50MB – this is a Live CD, the preferred route taken by most specialised distros these days, and can be installed to the hard drive with an easy-going script in the desktop menu. You can wipe a whole partition or opt to install into an existing one.

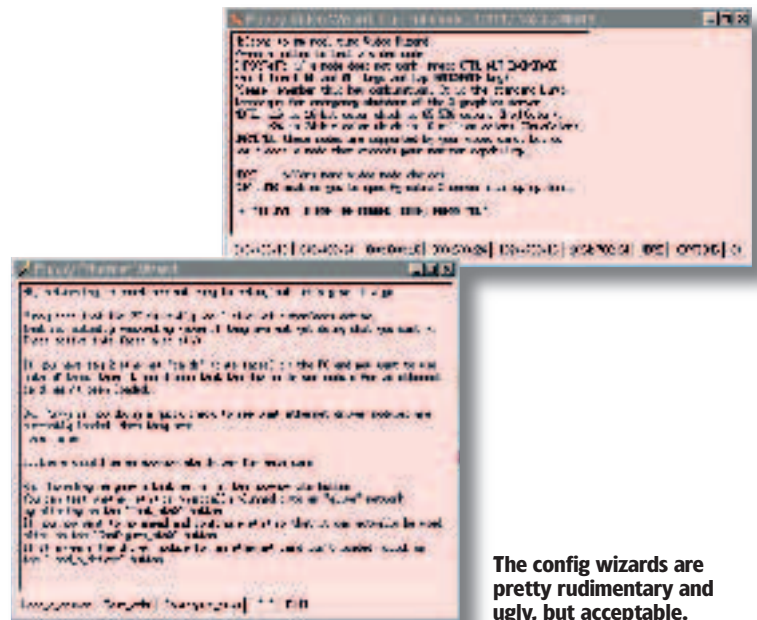
Using its own *libhardware* library for detecting devices, Puppy isn't quite as capable as the Knoppix-based distros – it didn't pick up all of the main hardware on either our main test box or its alternative. Most of the

essentials were identified and set up, though. Installing to a hard drive or USB memory key is straightforward via the command line-based script, while the boot process itself (for the standard install) is only slightly slower than DSLs. Thankfully, only minimal configuration by hand is necessary.

Puppy uses *FWWM95* to deliver a familiar Windows-esque desktop. This does a respectable job (perhaps the slicker and more frequently updated *IceWM* would be a better choice) with the *ROX* file manager providing desktop icons and a polished file browser. *ROX* takes its inspiration from RISC OS – as found on old Acorns and super-cool modern Lyonnix boxes – but doesn't feel all that alien in use. For the most part, anyone familiar with Windows will have no trouble navigating the desktop and running the superb range of apps.

Pet project

When it comes to software, Puppy takes a slightly heavier approach and sports some of the finest *GTK 2* apps around: the justly popular *Firefox* for web browsing, *AbiWord* and *Leafpad* for documents, *Grisbi* for personal finance, *mtPaint*, *Dia* and *Sodipodi* for graphics, *gxine* for media playing, and so much more that we don't have room to list. All the applications are recent. Indeed, at the time of writing, Puppy was the most up-to-date of these mini distros, although that can



The config wizards are pretty rudimentary and ugly, but acceptable.

change with a single release. The downside: *GTK 2* apps tend to be heavier on resources than *Xt* and *Mo/ LessTif* equivalents.

General system administration chores are aided by the handful of wizards. These aren't as flashy as those that you'd see on Mandriva and the like, but they get the job done effectively – particularly thanks to the oodles of built-in tips. Printing,

as what needs updating and the limitations of supplied libraries, along with a busy forum with users exchanging help and tips.

Damn close

Naturally, the big comparison is with DSL. Puppy scores some points for its clean Win9x-alike desktop (not necessarily a wonderful thing, but definitely a help for the uninitiated)

“A SPECIAL MENTION SHOULD GO TO PUPPY’S MARVELLOUS DOCUMENTATION, WHICH MAKES IT A GREAT CHOICE FOR LINUX NEWCOMERS.”



GTK apps aplenty in Puppy's desktop – it all fits together smoothly.

networking, CD-burning and other tasks can be accomplished with these, and it's great to see attention being paid to GUI configuration in such a limited environment. Some of these wizards are more robust and featureful than the config tools included with certain mainstream distros (yes, TurboLinux 10F, we're talking to you).

A special mention should go to Puppy's marvellous documentation. Detailed descriptions of the system's layout and underlying workings, together with well-written step-by-step guides to installing on other media, make it a great choice for Linux newcomers. There's also a reasonably up-to-date doc on developing or enhancing Puppy (such

and its software is slightly more up to date than DSLs in the current release. It loses on hardware detection and the relatively weighty apps – there aren't as many slim alternatives as in DSL. Still, this is a matter of target system rather than a failing *per se*, so if your machine is better endowed than the machines other mini distros are targeting, Puppy can offer more.

LINUX FORMAT VERDICT

The *GTK 2* apps take up precious room, but make Puppy a sound choice for speedier boxes.

RATING **7/10**



Feather Linux

Knoppix remaster with the latest apps.

- **VERSION** 0.7.3.1 ■ **WEB** <http://featherlinux.berlios.de>
- **PRICE** Free under GPL

The impact of Knoppix on the Linux world cannot be overstated. This immensely well-engineered Live CD created a whole new group of Linux users, so it's not surprising that many of the best mini distros are based on it. One of them, Feather Linux, strives to provide everyday desktop software in a compact space – you can run it straight from the CD, install it on to a USB key or drop it directly on to a hard disk. It's also the largest entry in this roundup, with the main ISO reaching 123MB.

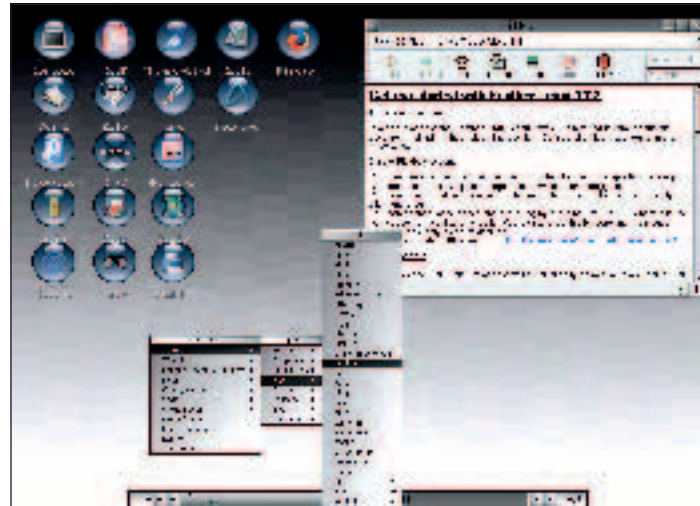
Thanks to Knoppix's tip-top hardware detection, Feather should have no problem with the vast majority of devices (it worked like a charm on our two test systems) and the 2.4.27 kernel ensures a great deal of stability. Helpfully, the hard drive installer script uses a mixture of CLI tools such as *fdisk* and pop-up dialog windows, and

anyone with basic partitioning knowledge shouldn't have any troubles getting to grips with it.

The *Fluxbox* window manager takes centre stage once again (*ROX* sits behind it as the file manager), but although the super-smooth desktop icons add a neat cosmetic touch, the main menu is messily organised (same problem in *IceWM*, also included).

Notable apps include *Firefox*, *MPlayer*, the *Gaim* chat client, *Thunderbird* and a stash of text editors, along with *AbiWord* and *XMMS*. Handily, additional software and drivers can be downloaded straight from the WM's menu if you need light alternatives to the larger apps, which is crucial.

Ultimately, Feather Linux can't boast of any major feature that puts it above the rest. It's solid, runs at an adequate speed and has the big-name apps, but... there's only a



An attractive desktop, but the menus could do with some work.

scattering of mix-and-match config tools, little effort in organisation of the desktop and a general lack of polish. It all feels bolted together rather than carefully crafted. Still, it's not bad and if *DSL* or *Puppy* don't run properly on your machine, it'll do as a fall-back.

LINUX FORMAT VERDICT

Feather doesn't offer anything outstanding, but it's still (just) above average.

RATING **6/10**



muLinux

Floppy disks still have some use, then...

- **VERSION** 14r0EB ■ **WEB** <http://mulinux.sunsite.dk>
- **PRICE** Free under GPL

If there's one thing you can almost certainly rely on with old machines, it's the presence of a floppy disc drive. Most of the distros on test here are designed for CD or USB key installation, but *muLinux* (mu indicating a millionth) squeezes an unbelievable amount out of floppies – so it's the best choice for really

ancient kit. It'll even fit into 8 megs of RAM, depending on add-ons.

For hard disk-less machines, *muLinux* will copy itself into memory – although there are methods to install it fully, using the supplied script or extracting straight on to a DOS/FAT partition. The latter makes use of the *UMSDOS* filesystem – this provides

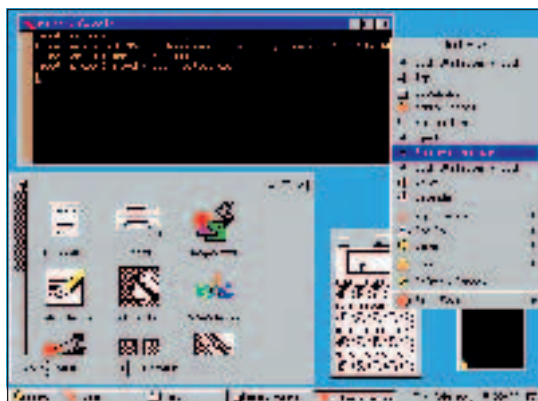
workarounds so that Unix filesystem features can be recreated on a foreign partition. It's immensely useful if you want to keep *DOS/Win31* on a box and don't fancy partitioning hassles.

MuLinux's base system is very trim: the reliable 2.0.36 kernel includes a bunch of network drivers, while *BusyBox* provides essential command line tools (as found in GNU *coreutils*). There's also *Lynx* and some games. Where *muLinux* really shines, though, is with the add-on packages that can be copied to extra floppies or installed on the hard drive. These beef up the distro with X support, a small development toolchain, server packages (*Samba*, mail servers etc), *Netscape 3* and much more – all without bloating the original system.

For desktop use, *muLinux*'s X add-on includes a bare-bones *FVWM95* and *Xfm* desktop running on a vanilla VGA display, while *AfterStep*

and *wm2* are also available along with a better *SVGA* driver (included in the *Netscape* bundle). Cheerful dialogs abound, and there's plenty of feedback and help during the setup; for instance, the PC-speaker melody that plays as X is configured.

A brief guide to Unix is popped up for newcomers, along with a cursor-driven list of apps to try, and everything's finished off with humour and style. It really is amazing how much can be crammed into a few floppies. In all, *muLinux* isn't as versatile as the other offerings but works a treat on really old boxes.



It's not gorgeous, but the whole X subsystem fits on to a single floppy. Egad.

LINUX FORMAT VERDICT

Doesn't rival the bigger players – more of a solution for prehistoric systems.

RATING **5/10**



MINI DISTROS THE VERDICT



DAMN
SMALL LINUX
8/10

DSL gets our vote but for more mini distros, visit <http://distrowatch.com>.

It's pleasing to see so much effort and enthusiasm going into these mini distros. While the developer teams are rarely big enough to make double figures, as opposed to the colossal community efforts behind Debian and Fedora, they're doing an applaudable job – spreading the benefits of free software even further.

Yet there's another side to this. For most of us, mini distros are a way to convert quondam Win9x boxes into something more useful. But for many users in less affluent countries they can make reliable penguin-powered machines a lot cheaper to acquire. No need to splash out on larger RAM and zippier CPUs – just get a bunch of old boxes, inject some life with DSL and co. and you have effective little workstations or servers.

Which of the six comes out on top? All of the mini distros on test here do their job solidly, and they all have a slightly different focus. The best all-rounder is DSL: it just creeps ahead of Puppy by offering a smashingly broad range of apps for all levels of hardware – and on top of that you have the nifty config tools and assistance from a forum with nearly

4,000 members. Nevertheless, Puppy and Feather deliver a greater number of powerful apps out of the box for faster hardware, while INSERT is more useful for recovery.

MuLinux is naturally the weakest of the lot; the outrageous amount squeezed in to a few floppies is incredible but it still can't match the big trio. It's by far the best for ancient hardware, though. ZipSlack doesn't provide an immediate experience, but regular Slackers will enjoy a familiar system and the ability to expand it with their favourite apps straight away.

Finally, some notes about the table of features here. 'Boot speed' indicates the time taken to get from bootloader to login screen or desktop, which can vary widely from system to system – particularly how quickly your specific hardware is recognised. (Some devices take an age for the kernel to probe, so we've given a general level rather than system-specific stat.) 'Minimum RAM' is the distro's recommended memory, while the disk space figures show how much is taken up after a hard drive install. As so much varies with different systems and configurations, these stats are best used for comparison purposes only. **LXF**

OVER TO YOU

Have you invigorated an old PC with a mini distro? Let us know your package of choice, and how it stacks up against the six in our Roundup, by posting on the LXF forum at www.linuxformat.co.uk.

TABLE OF FEATURES

Name	Kernel	X version	Size	Disk space	Minimum RAM	Desktop	Boot speed
Damn Small Linux	2.4.20	4.2.1	50MB	129MB	16MB	Fluxbox	Medium
Feather Linux	2.4.27	4.3.0	123MB	277MB	24MB	Fluxbox	Medium
INSERT	2.4.27	4.3.0	50MB	n/a	32MB	Fluxbox	Slow
muLinux	2.0.36	3.1.2	6.2MB (DOS)	76MB (DOS)	8MB	FVWM95	Slow
Puppy Linux	24.3.0	4.3.0	52MB	Varies	32MB	FVWM95	Medium
ZipSlack	2.4.29	None	48MB	89MB	8MB	None	Fast