

Re: distribution

Distributions, the packaging of Linux with the essential system utilities and the applications to run on it, turned Linux into the phenomenon it is today, says Ruediger Berlich, concluding his two-part look at Linux history

The very earliest versions of Linux, in 1991, consisted of two floppy disks, a boot disk that contained the kernel, and a root disk that set up the file system and came with some of the basic GNU tools. Copies of these disks, and the Linux source were downloadable from the Helsinki University server. Configuration was manual and complex.

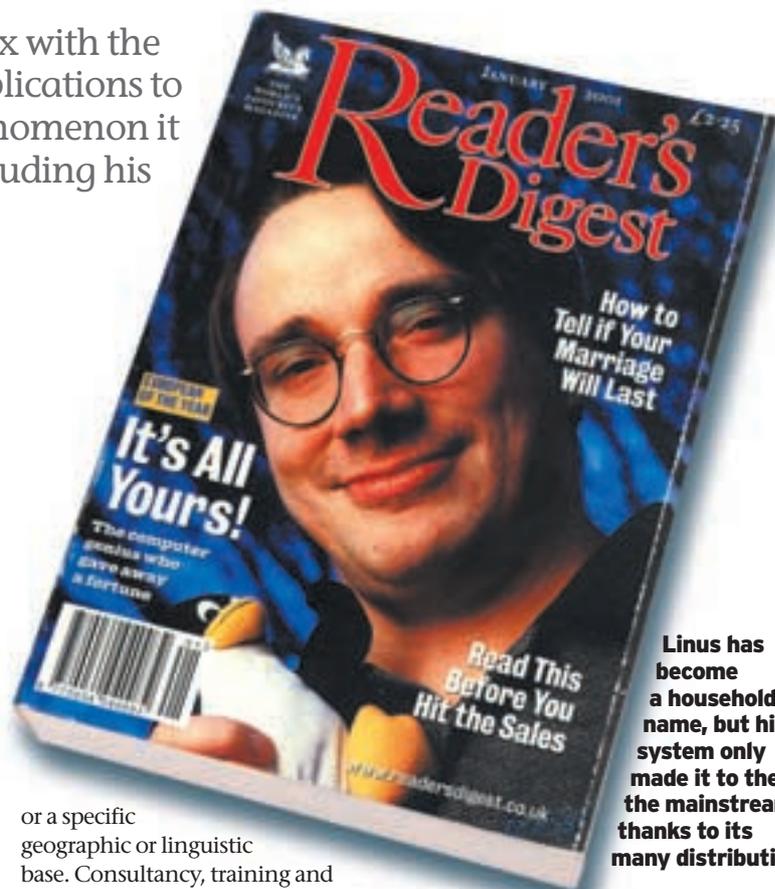
As more software became available, this method was no longer sufficient, and Linux distributions came into existence. A distribution was a package containing a ready-to-run selection of available software plus installation utilities, configuration tools and documentation. Most Linux distributions were begun by enthusiasts to spread the word and increase the availability of Linux. Some of the more successful have matured into sophisticated enterprises, generating income from commercial support services.

The first Linux distribution was created by Owen Le Blanc at the Manchester Computing Centre (MCC) in the north west of England. The first MCC Interim release, as it was known, was released in February, 1992. This was followed shortly after by the Softlanding Linux System (SLS), founded by Peter McDonald, which was the first comprehensive distribution to contain elements such as X and TCP/IP, and the Slackware distribution maintained by Patrick Volkerding (initially based in large parts on SLS). SuSE Linux was founded in late 1992, was originally based on Slackware, and later integrated the Jurix distribution of Florian La Roche. Red Hat was founded in 1993, absorbing aspects of the Bogus distribution (the package mechanism, for instance). Caldera, Mandrake and TurboLinux (the other main commercial Linux distributions) were based on modifications of Red Hat.

Apart from SuSE there were two other popular distributions based in Germany. LST, which was later bought by Caldera, and DLD, which was purchased by Red Hat. Debian was started as an independent project by Ian Murdock in late 1993, in order to provide a free alternative to the commercial Linux distributions.

There are currently estimated to be about 140 Linux distributions, specialising in different aspects of computing

'Linux has always appealed as a story to the press, and as a happy redefinition of software development methodology to software engineers'



Linus has become a household name, but his system only made it to the mainstream thanks to its many distributions

or a specific geographic or linguistic base. Consultancy, training and support have become the focus of business for the distributions such as SuSE, a quarter of whose 500 employees work in the Professional Services division.

Standards in the Linux world

Over time a series of standards have been established for Linux. First and foremost, Linux is compliant with the Posix specification, although it has only once undergone the procedure of formal certification, and that was several years ago (by Unifix Linux). So while Linux cannot claim to be Posix-compliant, it nevertheless fulfills most of the requirements.

Linux implements most of the specifics of both the System V and BSD Unix branches, so that porting software from either branch is relatively straightforward.

There are some tools which have become de facto standards. One such is the RPM package management (Red Hat Package Manager), that allows the installation and seamless removal of software packages. The RPM package format is used by almost all distributions, notable exceptions being Debian and Slackware.

The LSB (Linux Standard Base) was created to ensure a common standard among the different Linux distributions to simplify the task of porting software to Linux.

Linux systems universally use the X Window System. X has a long history of its own, and very possibly a rosy future ahead of it (see The joy of X, LinuxUser February 2001, page 30). Its availability further facilitates porting software from other Unix systems to Linux.

As far as desktop environments are concerned, there are currently two mature choices, GNOME, led by Miguel

de Icaza, and KDE, which was begun by Matthias Ettrich. Applications developed for GNOME will run on a KDE desktop, and vice-versa.

Applications, applications

While the standard Unix tools, as generated by the Free Software Foundation, were available from the beginning, there were few mainstream desktop applications, a situation that has been rectified for the most part by the energies of the Linux developer community, and more recently, by commercial software companies.

The classic example of a successful free software application is The Gimp, (GNU Image Manipulation Program), which is considered by many to rival Photoshop in its capabilities. There are many others, such as LyX, the typesetting software developed by Matthew Ettrich (the developer who initiated the KDE project), and Abiword and Kword, which are full-featured word-processors. Kword is part of the Koffice suite developed for KDE, which includes all the standard facilities of a commercial office suite.

The first Windows native commercial desktop applications to be ported to Linux were Corel WordPerfect and StarOffice by StarDivision. StarOffice was ported to Linux after a concerted campaign by Linux users, and was made available for free before StarDivision was purchased by Sun Microsystems. It has since been GPL'd (placed under the GNU General Public Licence), and is being re-engineered by the free software community under the name OpenOffice. Applixware Office, available from VistaSource, has also been available to Linux for many years.

Netscape and Mosaic, the original web browsers, were made available to Linux users more or less from the beginning. The Opera browser is a commercial, cross-platform browser that features a very fast rendering engine. The most popular of the open source web browsers used on Linux platforms include Konqueror, Lynx and the rapidly improving Mozilla.

Other applications have followed. On the server side there is a comprehensive selection of commercial tools, from the Zeus webserver through to Oracle and Lotus Domino. The recent release of Borland's Kylix Rapid Application Development environment will encourage Visual Basic and Delphi programmers that there is an alternative platform available to them.

There are tools available for most areas of application and, while it is true that Linux is still stronger on the server side, with upwards of 25 per cent of the market, according to the German magazine *Der Spiegel*, worldwide usage of Linux on the desktop has bypassed that of the Apple Macintosh – traditionally the free thinker's choice.

The Unix unifier

In the last few years Linux has gained acceptance from every kind of enterprise, to the extent that IBM has put Linux at the core of its product range. Some date the rapid

rise of Linux to the release of the 2.2 kernel. Others see the pivotal moment as the accidental release of the internal Microsoft memos that came to be known as the Halloween Documents, which vilified Linux and other open source software projects. However, Linux has always appeared as a story to the press, and as a happy redefinition of software development methodology to software engineers.

The biggest allies of Linux during this period have been Unix companies, Compaq, IBM, HP and SGI. Linux has opened new markets to these companies, whose primary business is the sale of hardware. Belatedly, many of them have seen the bonus of a system that provides compatibility across such a wide range of platforms. Many now provide Linux APIs on their native Unix platforms. Linux may yet be the fulcrum around which the Unix world unites.

The Tanenbaum flamfest

With all this success, Linux has had its critics. One of the better-known disputes happened between Andrew S Tannenbaum, who is widely perceived as the 'Pope of Informatics', and wrote the Minix operating system, and Linus Torvalds.

Andrew S Tanenbaum, 29 January 1992

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Subject : Linux is obsolete
[...]
MINIX is a microkernel-based system. The file system
and memory management are separate processes, running
outside the kernel. The I/O drivers are also separate
processes (in the kernel, but only because the brain-dead
nature of the Intel CPUs makes that difficult to do
otherwise). LINUX is a monolithic style system. This is
a giant step back into the 1970s. That is like taking an
existing, working C program and rewriting it in BASIC. To
me, writing a monolithic system in 1991 is a truly poor
idea.
[...]
Don't get me wrong, I am not unhappy with LINUX. It
will get all the people who want to turn MINIX in BSD
UNIX off my back. But in all honesty, I would suggest
that people who want a **MODERN** "free" OS look
around for a microkernel-based, portable OS, like
maybe GNU or something like that.
[...]
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Linus Torvalds' answer

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> MINIX is a microkernel-based system. [deleted,
but not so that you
> miss the point ] LINUX is a monolithic style
system.
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If this was the only criterion for the "goodness" of a
kernel, you'd be right. What you don't mention is
that minix doesn't do the micro-kernel thing very
well, and has problems with real multitasking (in the
kernel). If I had made an OS that had problems with a
multithreading filesystem, I wouldn't be so fast to
condemn others: in fact, I'd do my damndest to make
others forget about the fiasco.
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[ yes, I know there are multithreading hacks for
minix, but they are hacks, and bruce evans tells me
there are lots of race conditions ]
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Key links

The Halloween documents
www.opensource.org/halloween
The Tanenbaum flamfest
www.educ.umu.se/~bjorn/mhonarc-files/obsolete