



eLAN™ Technology White Paper

Why Linux?



Introduction

This white paper summarizes the reasons Linux was selected as the operating system for BOW Network's *eLAN*TM platform.

Linux has received a great deal of publicity in recent years, and substantial support within both Fortune 500 companies and small firms on the cutting edge of technology. It is a dominant player in server applications, and is becoming increasingly important in embedded and mission-critical computing applications.

This paper gives the reader an overview of the technical merits of Linux and highlights the growing commercial success of this operating system.

Linux history

Linux is a computer operating system patterned after Unix. It was originally developed in 1991 by a Finnish student named Linus Torvalds as a computer science project. As Torvalds was developing his operating system, he incorporated help from other designers to port existing Unix applications to this new operating system. As more and more code was developed by various designers, it was integrated into Torvalds' project and, in January 1992, Linux had its first widespread release. Today, there are software developers around the world who have contributed to the Linux operating system.

Technical benefits

A true networking OS

Linux was conceived of and developed to be a networking operating system; and is specifically targeted at networking and server applications, such as the following:

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| Internet Gateway | Linux can be configured to route IP packets to the Internet. |
| Web server | Linux can be used to host web pages developed within a company using the Apache web server software, or other web servers. |
| E-Mail server | Linux can be used as an e-mail server using sendmail and fetchmail software to forward e-mail over the Internet. |
| Networking | Linux provides support for various networking protocols such as IP, X.25, IPX, AppleTalk, Netrom, etc. |

Linux provides powerful networking services, which had been well established originally within Unix. Linux is a very robust multi-user, multi-tasking operating system, which provides a full suite of TCP/IP networking services, including SLIP and PPP serial networking. Linux also provides a complete range of network client applications such as the following:

FTP (file transfer protocol) allows files to be transferred between any two machines anywhere on the Internet.

TELNET enables a user to login to a remote computer as if they were sitting in front of it.

NFS (Network File Sharing) provides access to files on another network machine by mounting remote directories to your local computer. If required, this may be implemented in a secure manner. This capability may also be extended to Windows machines, using SAMBA.

SMTP (Simple Mail Transfer Protocol) provides network e-mail services.

Remote administration

Linux systems are simple to administer remotely. Applications may be added, upgraded or removed from the system, without requiring a system re-start.

Robustness

Under Linux, applications run in their own memory, greatly reducing the possibility of a given application interfering with another. Although individual applications may fail due to software bugs, they will not cause the entire system to fail.

If problems arise during an upgrade, Linux makes it easy to revert to previous versions of applications.

Reliability/stability

Linux has proven itself to be a very reliable operating system, which in many cases operates for years without a restart. When problems are discovered, there is a huge community of developers and testers who attack the problem; this collaborative approach has proven to provide rapid problem resolution. No company has a vested interest in hiding problems.

Security

Linux's security capability is highly granular, allowing as much security, or as much openness, as required.

Firewall server Using IP tables or a Proxy server, Linux can be configured as a network firewall to protect a private network from intrusion.

IP Masquerading Linux can allow multiple computers to share a single IP Address. Privileges are granted on a per user/per application basis.

HW independence

Multi-platform support Linux can now be run on a wide variety of CPUs, not just the Intel 80386.

Scalability

Linux is a compact, well-organized operating system. Initially, Linux was designed to operate on an Intel 80386 CPU, which is common in older PCs. This architecture allows users to run Linux on inexpensive hardware platforms, transforming simple PC hardware into a full featured, fully networked workstation.

Backwards compatibility

The Linux development philosophy of backwards compatibility will continue to provide benefits in the future. We can be assured that future versions of Linux will continue to support today's hardware, allowing users to reap the benefits of evolving technology, without costly hardware upgrades.

Open Source/Open Standards

The open source philosophy of Linux is the key to its success. There is no central authority deciding what's best for its users. There is no risk that certain features will be abandoned over time. Most importantly, the source code is available for review and archiving, ensuring that systems installed today will be fully supportable in the future.

Linux developers follow the recommendations of the Internet RFCs, and the W3C, without trying to gain competitive advantage through proprietary "extensions."

Continual evolution, based on market needs

Because Linux has a well-established community of software developers, new features and capabilities are constantly being added to the kernel. Not only is the kernel evolving, but also an increasing number of applications are being ported to Linux. Applications are free, or very inexpensive, and include everything from office applications to software development and graphics tools. Since Linux is open source, users can fully customize the operating system to their application, and fix their own bugs in the system. Try being able to access operating system source code, and re-compile with a licensed software package!

As a result of Linux's constant evolution, it now provides some other powerful features and applications:

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| Transparent file access | Linux supports access to Windows-style file system formats in Windows 98 and Windows NT format. |
| Windows network access | Linux supports full access to an existing Windows network using the Samba application. |

As a direct result of the Linux software community evolving the kernel and providing world-class applications, the Internet provides a wealth of information surrounding Linux. If you have a problem, someone has most likely seen it and published a solution on one of the common Linux websites, such as linux.com or linux.org. Inexpensive support contracts are also available to end-users from various Linux distributors such as RedHat or Mandrake.

Success Stories

A number of companies are having success using the Linux operating system:

- Sun Microsystems has made a broad commitment to Linux.
- IBM is providing Linux hardware, software, and support solutions.
- Compaq is selling Linux-based Alpha server systems.
- Dell is selling Linux-based PCs.
- Hewlett-Packard is selling Linux-based server solutions.
- Lycos is running RedHat Linux on its Web servers.
- Cisco is using Linux-based printer servers.
- Lotus is developing Linux-based server software.
- Google search engine based on one of the world's largest Linux clusters