

# Linux: Open for Business

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## What is Linux?

First developed in 1991 by Linus Torvalds when he was a young student at the University of Helsinki, Linux has now been embraced worldwide as a flexible, secure, robust, and cost effective operating system.

Linux, an open source operating system, is a very exciting concept and technology because it works across many architectures. If an organization wants to make sure that its applications are supported widely, it should consider Linux as a solution.

Open source involves programmers from around the world working together across the Internet to enhance common code. This collaboration results in the rise of standards and fuels innovation, making Linux robust, flexible, and cost effective. Technologies like Linux that are built according to open standards are incredibly powerful-- the Internet is a perfect example of the power of standards and worldwide collaboration.

Organizations are increasingly turning to Linux to integrate their data and applications on one common platform. This allows them to simplify management of their IT resources and generate a greater return on investment.



## How widely accepted is Linux?

In the short period since the concept of the open source operating system has been introduced, Linux has gained rapid worldwide acceptance in both public and private sectors. IBM's investment in Linux during the 1999 to 2000 fiscal year fueled the rapid acceptance of the open source platform as an integral part of an organization's IT infrastructure. Industry trends suggest that the adoption of Linux will continue its rapid ascent:

IDC reported that in 2003, revenue from Linux servers increased 63.1 percent year-over-year, while unit shipments jumped 52.5 percent.

- A Gartner analyst report released earlier this year reported that 70 to 80 percent of enterprises have already deployed Linux in some form or manner.
- IDC predicts that Linux will eventually become a substantial volume competitor to Windows, garnering more than 30 percent of the marketplace in 2007. In fact through 2008, only three operating systems are expected to register growth: Windows, AIX and Linux.

## How are organizations using Linux?

Linux, as an open platform, gives companies the ability to develop where it makes sense and deploy where they choose. Linux enables businesses to have access to applications that run across many architectures. Organizations are now implementing Linux not only for standard applications such as file-print and Web serving, but are also deploying Linux in mission critical environments.

The most prevalent workloads and applications deployed on Linux are as follows:

**1. Workload consolidation:** Linux is allowing businesses to simplify IT infrastructures, including servers, databases, applications, networks and systems management processes. When everything works on one common platform, applications become easy to manage. Workload consolidation reduces costs across the board and grows top line revenue-- translating into an increased return on investment.

An international airline company was looking to ease administration processes associated with its large, distributed IT environment. The airline is responsible for IT systems at many travel agents and airports across the country. Remote management of these systems, including software upgrade distributions and system monitoring, was proving to be an expensive and time consuming process. They decided to put their existing IBM eServer zSeries 900 servers to further use by implementing two Integrated Facilities for Linux (IFLS) running SuSE Linux Enterprise Server (SLES) V7. In conjunction with other elements of the self healing system, the secure Linux platform provides higher availability of the IT environment. The heterogeneous environment in which the system operates makes it easier to manage. This has helped the airline in reducing IT maintenance costs.

**2. High Performance Computing:** Organizations in fields such as bioinformatics, seismic processing, digital signal processing, and financial services operate in environments that call for especially high levels of reliability and availability. The standardization that results from deploying Linux as a common platform helps in reducing costs and increasing availability of critical data.

Due to its robustness and flexibility, Linux is an essential component of architectures for High Performance Computing such as clusters and blades. IBM's eServer BladeCenter JS 20 with 64 bit Power blades, not only reduces the number of cables and amount of floor space due to the sharing of common resources, but also supports Linux in providing very high performance typically found in supercomputing environments.

Organizations that operate in fields marked by rapid innovation (such as Life Sciences) are increasingly turning to Linux. Take the example of a large Arizona based Life Sciences research firm that focuses on the discovery of genetic changes underlying a variety of human diseases, developing and validating diagnostic tests for disease, as well as uncovering new targets and treatment approaches for cancer and other debilitating diseases. To support their mission, they needed to build a high performance computing facility from the ground up.



The research institute decided to deploy a powerful supercomputing infrastructure that consists of 512 nodes of xSeries 335 servers packaged in an IBM eServer Cluster 1350 running Red Hat Linux, complemented by five IBM eServer pSeries servers. This system is open, reliable, cost effective, and capable of processing a large quantity of data for analysis. It is also flexible and can be adapted easily as and when their needs change in the future.

**3. Infrastructure solutions:** Collaboration/e-mail, File/Print, Security/Firewall, Systems & Network Management, and Static web serving applications continue to drive Linux numbers in the marketplace. This is not a surprising fact given that these applications were what drove the adoption of Linux in the first place.

A leading online renter of DVDs depends heavily on email. Their existing operating system solution, Microsoft Exchange running on Windows, was often unreliable and frequently crashed, requiring the staff to reboot the machines on a routine basis. They decided to move to a solution based on the Linux platform. The solution is currently installed on two IBM eServer xSeries 440 servers running on the reliable, available, and scalable Linux platform. The open-standards-based, user-friendly Linux distribution is much more reliable and requires less maintenance than Windows. It also allows them to deliver customized content to its end users.

**4. Industry applications:** Given its superior flexibility, scalability, and reliability, Linux is quickly moving into mainstream application solutions. Industry sectors ranging from telecommunications to retail and finance are reaping the benefits of interoperability and potential for long term integration.

IBM has partnered with Novell/SuSE Linux on a point of sale Linux solution. The new solution is designed to help deliver a stable and secure infrastructure and incorporates a centralized management system customized for the retail market. The increased reliability, integration and cost efficiencies translate into increased security and lower price both for the end customer and the retailer-- a true WIN-WIN situation.

Affirming an emerging trend, PeopleSoft recently released 170 applications for Linux on IBM eServer. Organizations operating in vertical industry segments are meeting the needs thrown up by changes in labor, capital, supply, demand, and competition by discarding IT infrastructures comprised of disparate elements that cannot talk with one another. They are instead turning to Linux which allows for more effective management through integration of resources.

#### **Linux: IBM is the market leader**

A recent Gartner study rated Linux vendors' capabilities on platforms, partnering, software stack, open source collaboration, services and support, and programs, and concluded that IBM was number one in every category.

Industry opinion leaders were skeptical when IBM embraced the open source operating system as early as 2000. Adopting an open standard was totally contrary to conventional business sense. However, IBM saw Linux as the perfect vehicle that would truly enable it to deliver on-demand solutions-- a philosophy that is the very essence of its business offerings. In the years following IBM's adoption of Linux, many companies entered the Linux space. However, IBM built on the early mover advantage and has developed superior capabilities in every area. Currently, IBM's solutions allows businesses to reap the benefits of the new Linux kernel V2.6, which incorporates deep subsystem overhauls that yield improved scalability, performance and responsiveness across the full range of systems on which Linux runs. IBM's Linux Technology Center is playing a key role in bettering Linux in a manner that is valuable to businesses, and is now firmly established as a pioneering and respected member of the open source community.

There are many synergies between IBM's portfolio of products and Linux. One example is IBM's Linux solutions working hand in hand with the revolutionary 64 bit POWER architecture. This combination allows businesses the flexibility to run any application you need anywhere, anytime, without the usual price/performance trade offs.

IBM has also deployed Linux internally. Mission critical applications that run Linux include the IBM website support of IBM's new \$300 million chip manufacturing operations, and other applications supporting more than 300,000 employees worldwide.

**Linux is the future**

Like the Internet, Linux brings a common standard to technology that frees developers and encourages increasing innovation. Linux is here. Linux is now. And most importantly, Linux solves problems.

The penguin has arrived.

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