

Realize the Benefits



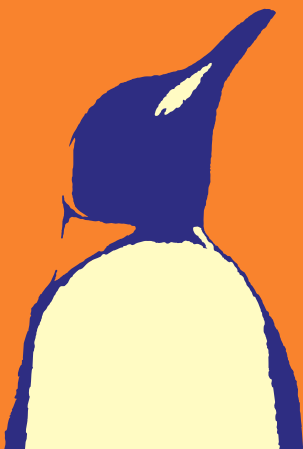
Government Solutions on Linux





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Linux: improving citizen services while managing costs

Government IT is undergoing a revolution—shifting from proprietary systems to an open source computing environment. The public sector is adopting the open source Linux® operating system as the foundation for this shift to provide better citizen services, minimize security risks and lower IT costs. Thousands of government IT organizations in more than 100 countries, representing every level of government, have adopted Linux.

The demand for higher levels of citizen services continues to rise. Energized by their own experiences on the Internet, individuals and businesses are demanding the same level of Web-based services from the public sector—what could be called *e-government on demand*. Because it has a built-in affinity for the Internet, Linux can be an ideal platform for creating such self-service Web applications.

The support for open standards enabled by Linux is helping government IT organizations minimize their security risks through vendor independence. By leveraging the ability of Linux to support a variety of platforms—including IBM **@server**® systems—governments can avoid the pitfalls of proprietary solutions. The openness of Linux also provides freedom to choose the best software, the best vendors and the best consultants to meet your requirements.

Linux is also an excellent platform for providing great constituent services with shrinking budgets. In fact, recent research from the TowerGroup found that, compared to UNIX® and Microsoft® Windows NT® platforms, Linux has the lowest license, installation, administrative and support

costs for certain business functions.¹ Because IT systems based on Linux can help lower infrastructure costs, this in turn can free up more IT budget for developing and deploying new or improved services—such as Web-based motor vehicle registration and renewal.

Since Linux was introduced in 1991, no other operating system has spread as quickly across such a broad range of systems. According to studies by market research firm IDC, Linux is currently the fastest-growing server operating system, with shipments expected to grow by more than 34 percent per year over the next four years.²

The growth of Linux is attracting large numbers of software companies. The IBM Global Solutions Directory lists more than 4,000 applications that run on Linux, enabling you to leverage the value of Linux through innovative new applications as well as widely used, proven applications.

With its high performance and extensive scalability, Linux can help improve response to unexpected constituent demands and help speed new government initiatives. By harnessing increasingly powerful Intel® processor-based servers, Linux can help the government sector leverage inexpensive commodity hardware to perform critical functions.

For example, military and intelligence agencies around the world are running IBM Linux solutions for a broad range of applications, such as computational fluid dynamics, weapons design, environmental sciences, numerically intensive computing, simulation and animation. In addition, the international research and development communities in government have adopted Linux as one of their standards for running on Intel-based clusters.

Linux can benefit four key areas

- **Workload consolidation:** By consolidating distributed workloads (such as Web serving) from competitors' systems onto IBM platforms, government agencies can realize reduced costs, efficient resource utilization and simplified management.
- **Distributed Linux:** Government agencies with geographically dispersed locations can leverage low-cost, centrally managed, robust Linux servers that are easy to replicate.
- **Clusters:** IBM Linux clusters include scalable configurations of servers, storage hardware and cluster management infrastructure. These clusters are augmented with pre-integrated, pretested IBM middleware and IBM services tailored to government requirements—providing superior scalability and low-cost modular growth that is easy to deploy and manage.
- **Application solutions:** IBM middleware—WebSphere®, DB2®, Tivoli® and Lotus® software—running on Linux and IBM @server systems can enable governments to leverage technology to lower costs and improve services to constituents in vital areas such as voter registration and election monitoring, permit payment and tracking, work-flow management and statistical analysis.

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¹ Dushyant Shahrawat, "Wall Street Romances the Penguin: The Growing Popularity of Linux," TowerGroup report, September 2002.

² IDC Server Market Forecaster, December 2002.



The new reality: deliver more for less

The new economic reality is that government agencies must do more with less—provide higher levels of citizen services and improve security while reducing costs. For governments to achieve this goal, they need to improve their IT infrastructures to support new services and move away from proprietary systems to lower costs, yet retain the IT skills base to manage this new IT environment. Linux can help meet these objectives.

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Use Linux to minimize IT security risks

Two architectural features enhance Linux security. Linux is modular in design, which allows users to download only the functions required for specific applications and exclude features that may introduce security vulnerabilities. The open source Linux code also provides fast, thorough inspection of applications, which can help reduce time spent identifying and fixing security vulnerabilities.

According to U.S. government officials, “Open source gives us the opportunity to have a proactive and preemptive identification of security holes by friendly analysis. As a result, this early identification and rapid repair of security vulnerabilities has become a major advantage of open source over more proprietary approaches to software development.”³

The greatest display of confidence comes from the U.S. federal government. Since December 2000, the National Security Agency (NSA) has contributed to Linux security development efforts by producing patches, reports, policies and tools for a security-enhanced version of Linux, known as SELinux. In addition, the U.S. Department of Homeland Security migrated its Web servers to Linux after running them on the Microsoft Windows® 2000 operating system for just a few months.⁴ Similarly, Linux has already obtained Department of Defense (DoD), Defense Information Systems Agency (DISA) and Common Operating Environment (COE) certification. COE is a DoD software security and interoperability specification and is broadly recognized as a critical computing standard across the U.S. government.

Use Linux to provide Web-based e-government

In an effort to lower costs and provide greater services, many governments are in the midst of a transformation—from bricks-and-mortar-based services to e-government—providing self-service to citizens over the Internet. These self-service applications can help government’s lower costs, but require a reliable, scalable IT infrastructure that can integrate existing databases and applications, often across agency boundaries. The fast, reliable, streamlined, scalable and Internet-ready characteristics of Linux make it particularly well suited to host these e-government applications.

For example, the postal department in China’s Hei Long Jiang province, a sparsely populated region in northern Manchuria, sought an electronic record-keeping system and a Web-based branch office network to automate manual processes across thousands of branch offices.

³ Drew Clark, “Defense, cybersecurity officials praise ‘open source’ software,” *National Journal’s Technology Daily*, October 29, 2002.

⁴ Tina Gasperson “Dept. of Homeland Security site switches to Linux from Windows 2000,” *NewsForge*, January 27, 2003.



The department deployed an IBM @server xSeries® 200 server running Turbolinux DataServer and e-branch software. The Linux implementation has improved customer service at an attractive price/performance ratio.

Use Linux to retain skilled resources

Attracting and retaining technical staff is a constant concern for many governments. In the United States, for example, an estimated 40 to 60 percent of the DoD's total civilian workforce—many of those who work in IT, engineering, and science and technology—will be eligible to retire in the next three to five years.⁵ According to some experts, this situation could create a workforce shortage unlike any experienced before.

Linux can be a key tool for solving this potential IT skills shortage. Because Linux evolved from UNIX, IT staffs with prior UNIX experience can easily transition to working with Linux. The two platforms

share many core elements, and thus experienced UNIX programmers can quickly become Linux programmers, often in a matter of weeks.

Use Linux to streamline IT and reduce costs

With IT representing a bigger part of overall costs, streamlining IT itself can be a key objective. Thanks to the low total cost of ownership (TCO) of Linux—including low equipment, software and administrative costs—IT initiatives can often be more easily justified on Linux-based servers than on other platforms. This can result in more compelling business cases for using IT to improve government services.

Linux-based servers can help to deliver both capital and operating cost reductions. The operating system itself is very efficient, requiring less hardware resources than alternatives such as

⁵Matthew French and Colleen O'Hara, "DoD faces aging workforce," *Federal Computer Week*, May 26, 2003.

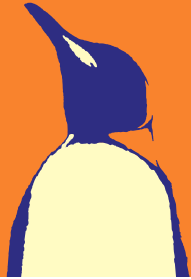
The value of Linux in government

- **Freedom to choose**—With Linux, there are no dead-end application migration or integration scenarios. Linux can help reduce the vendor lock-in that can interfere with execution and business goals.
- **On demand capability**—Government agencies can leverage the Internet to reach constituents and businesses to provide e-government services on demand.
- **Flexibility**—Linux, known for its record-setting horizontal scalability,⁶ can scale effortlessly to meet growing demands.
- **Reliability**—Linux provides greater uptime than Microsoft Windows, according to the Standish Research Group.⁷
- **Low cost**—Total costs (including equipment, software, administration and environmental factors) can be much lower than other platforms.
- **Security**—The combination of Linux's open source heritage, modular architecture and built-in security features (such as authentication, access control, real-time monitoring, audit-trail reporting of usage, transport- and network-layer security and encryption) can help minimize security risks.
- **Exceptional price/performance**—Reduced licensing costs and exceptional power help make Linux a great price/performer, giving IT organizations the opportunity to consolidate workloads onto fewer and less expensive servers.

⁶Transaction Processing Performance Council, www.tpc.org. The TPC-H is a decision-support benchmark. The benchmark test was performed on a four-node xSeries 350, with each node featuring four Intel Pentium® III Xeon™ processors at 900MHz and 4GB of memory, and running IBM DB2 Universal Database™ V7.2 software and Turbolinux 7 Server.

⁷Standish Research Group report, *Is Linux Legit?* 2001.

Linux can provide the foundation for key IT initiatives that can make a difference.



Windows and UNIX. Because Linux is available on many platforms, you can select the best server to fit the workload. Picking the best server for the job can optimize the use of capital.

6 One example of reducing cost and increasing efficiency with Linux is the Oklahoma Department of Human Services. The department replaced its Hewlett-Packard servers with an IBM **@server** zSeries® 900 running SuSE Linux Enterprise Server 7. When considering all TCO factors—hardware, software, support, personnel, facilities, downtime, storage, network and services—the department was able to reduce TCO by about US\$989,000 over five years, which translates to a 39 percent reduction in overall TCO.

Use Linux to improve efficiency

IT automation holds great untapped potential to improve the efficiency of government operations and to serve constituents more effectively. This automation includes transforming core government processes to e-government on demand, providing citizen-oriented applications and streamlining transactions between government employees, businesses and other governments.

For example, Italy's government has embarked on a national campaign to increase government efficiency and improve government responsiveness to constituents. As part of this campaign, the Italian government introduced e-government

to one of its regions, Regione Lazio, which comprises the 5 million citizens of Rome as well as 380 surrounding towns. The goal for Regione Lazio was to connect citizens, businesses and municipalities to the regional government as well as to consolidate IT infrastructure for reduced TCO.

To accomplish this goal, the Italian government decided to transform the Regione Lazio Web site into an e-government portal. By implementing Linux, the e-Lazio Portal was launched in just two months and resulted in reduced TCO, thanks to the use of Linux and server consolidation.

IBM has the integration middleware and consulting expertise to help governments respond to changing demands and deliver the optimal services to meet constituents' needs.

Use Linux virtual services to provide government on demand

Whether the goal is to control capital expenditures, protect against technological obsolescence or address unpredictable resource demands, government agencies now have the option of choosing IBM Managed Hosting—Linux virtual services to meet all or part of their computing requirements. Linux virtual services feature flexible, usage-based pricing that enables government agencies to consolidate distributed server workloads onto robust servers running Linux, without the upfront expense of the hardware.

IBM Managed Hosting—Linux virtual services is designed to provide the capacity and performance you need, delivered through utility-like services. You pay only for the processing, storage and network capacity you require, and you can easily add more to handle planned growth or unexpected peaks over time. Among the many benefits Linux virtual services can provide to government agencies are the abilities to

deploy citizen services rapidly as well as to lower initial expenses by not having to pay for additional hardware.

Use Linux to stimulate economic development

Governments are using Linux to help stimulate economic development in two ways. First, they are providing incentives for IT developers to create world-class applications running on Linux. The income generated by these applications can help to raise wealth levels in respective regions and generate tax income for the respective governments. China, India, Brazil, Mexico, Germany and Canada are among the governments with active programs for economic development based on Linux. Second, governments are encouraging the development of Linux-based service industries. These industries can help increase employment and raise the economic standards in their respective countries.

IBM—a leading provider of Linux-based solutions for government

IBM has helped governments transform services and systems since 1917. Over the years—from the first automated U.S. Census to online applications serving citizens and businesses in many agencies and jurisdictions around the globe—IBM has supplied governments with innovative and cost-effective products and services.

By delivering products and services to support the Linux platform, IBM will continue to work with the public sector to deploy innovative IT solutions. Lowering costs, providing online services, streamlining IT infrastructures and minimizing IT security risks—all are possible with Linux-based IT systems. Use IBM's experience to leverage Linux and make a difference in your organization.





Why work with IBM to leverage Linux?

- IBM has thousands of Linux customer engagements worldwide.
- IBM has invested more than US\$1 billion, and 7,500 employees are involved in Linux.
- More than 4,700 IBM Business Partners support the Linux platform.
- IBM Linux Integration Centers, IBM Competency Centers and IBM Solution Partnership Centers around the world help customers design and deploy Linux solutions, help software vendors migrate their applications to Linux and provide software vendors with facilities to test their applications.
- IBM has strategic relationships with key Linux distributors.
- IBM offers an e-government portal solution that is designed to enable government agencies to offer end-to-end services to its constituents, in addition to providing convenient 24x7 user-friendly access to information.
- IBM's dedicated Linux Operational Support Services provide world-class support, including training, technical support, consulting and implementation services.

For more information about Linux and IBM, please visit ibm.com/linux



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