



**LINUX IS POPPING UP  
EVERYWHERE THESE DAYS.**

Learn how Linux and IBM are transforming all kinds of e-businesses.





These days, it seems like Linux® is everywhere you look: It's in the news. Installed on your competition's servers. On your CEO's mind. In fact, according to a recent poll by CIO.com, 39% of IT managers who took the poll said that Linux will dominate corporate systems by 2007.<sup>1</sup>

## The real story on Linux.

There's a reason why Linux is popping up everywhere. Since it was introduced in 1991, no other operating system in history has spread as quickly across such a broad range of systems as Linux, and it's finally achieved critical mass. According to studies by market research firm IDC, Linux is currently the fastest-growing server operating system, with shipments expected to grow by over 34% per year over the next four years.<sup>2</sup> With its innovative open source approach and strong security, reliability and scalability, Linux can help companies achieve the agility they need to respond to changing consumer needs — and stay ahead of the game.

You've probably got lots of questions about this important platform and, through our extensive experience with Linux, we can help you find the answers. No other single company has more Linux-related hardware, software and service solutions than IBM. We've been working with thousands of developers to create mission-critical applications for Linux and have 6,300 Linux customers to date. So here's the real story on Linux and how IBM can help you bring its benefits to your business.



# Linux: Security



**A real Linux story: “IBM for me is three magic letters that make problems like ours go away. And Linux is the perfect match on the operating system side for the reliability and stability of the IBM servers.”**

**– Newman Emanouel, *CFO, Thrifty Car Rental, Australia***

**A real Linux story: “In terms of reliability, availability and cost savings, Linux offers unique advantages over our prior operating systems. And IBM servers and IBM software bolster these benefits with high performance and excellent availability.”**

**– José Carlos Ramos, *e-Business Manager, Aitana, SBS***

Thanks to its unique open source development process, Linux is reliable and secure. The entire development process is governed by a “meritocracy,” a team specifically selected for their competence by the technical developer community. Each line of code that makes up the Linux kernel has been extensively tested and is then maintained for a variety of different platforms and application scenarios.

## **Fact: Linux is reliable and secure.**

This open, collaborative approach means the Linux code base continually hardens and improves itself. If a vulnerability appears, it gets the immediate attention of topical experts from around the world who can quickly resolve problems. According to Security Portal, which tracks vendor response times, Linux bugs were patched in less than 12 days on average — compared to up to three months for some proprietary platforms.<sup>3</sup> With the core resilience and reliability of Linux, businesses can minimize downtime and help their bottom line.

With these strengths in security, it’s no surprise that many governments are turning to Linux for some of their most sensitive computing needs. Linux has been adopted by government officials in China, France and Germany, among others, and our own Linux products were used to coordinate the election process in Mexico. Secure, reliable Linux solutions from IBM can help you ensure maximum uptime for your infrastructure.

**Where you’ll find Linux:** The Columbian Financial Group, Regione Lazio, GuideOne Insurance and Korean Air are just some of the IBM customers who rely on the strong security features within Linux.

# Linux: Applications



**A real Linux story:** “The new software licensing structure (from IBM) allows Boscov’s to decide where to run the services we need, giving us control over our software capital investment. The introduction of Linux support also affords us opportunities to exploit the low cost of ownership of this technology.”

– Harry Roberts, *SVP, Boscov’s Department Stores*

**A real Linux story:** “IBM’s server interoperability and application flexibility enabled lower costs and increased revenue” for Tommy Hilfiger’s TommyB2B portal.

– Dan Watson, *President of eOne Group,*  
*Systems Integrator for Tommy Hilfiger*

With a vast number of available applications and strong support from software developers, Linux has the solutions your business needs. According to a November 2001 survey by IT market research firm Evans Data Corp, 48% of international developers plan to target most of their applications to Linux. An additional survey conducted by Evans in August 2002 found that 51% of North American developers planned to target most of their applications to Linux.<sup>4</sup>

## **Fact: Thousands of business applications are available for Linux — and there's more every day.**

IBM is playing a key role in encouraging Linux applications development. IBM moved its middleware to Linux early, so our partners have been developing and porting applications to Linux for years. We also maintain ten Linux porting centers worldwide to make it even easier for ISVs to move their applications to Linux. Now, more than 4,700 IBM Business Partners support our Linux-enabled software and there are thousands of Linux applications listed in the IBM Global Solutions Directory. (Visit this constantly updated online catalog of applications available from our ISV Business Partners at <http://www.software.ibm.com/solutions/isv>)

With our deep Linux expertise and our extensive network of ISV Business Partners, IBM can offer complete solutions specifically designed for many different industries. An IBM @server™ solution that includes IBM middleware and applications from our Business Partners can provide you with a solution that's tailored to your needs in less time than ever, at a low cost. It's all part of how IBM is responding to the unique demands of your business.

**Where you'll find Linux: AxiomSL, eOne Group, J.D. Edwards, SAP and SAS are among the thousands of IBM Business Partners that are developing applications for Linux.**

# Linux: Scalability



**A real Linux story:** “With this Linux cluster, we find a cost-effective solution to apply the algorithms we’ve already developed in-house to run them faster than was possible before.... I believe that Linux, and open source computing in general, provides us growth opportunities for the future.”

– Jack Buur, *Principal Research Physicist, Royal Dutch Shell*

**A real Linux story:** “...Linux gives us the power, scalability and reliability we need at a reasonable price. We’ve saved thousands of dollars in licensing fees and expect the new site to drive dramatically higher sales.”

– Steve Shapero, *IT Director, Satellite Records*



With excellent performance and strong clustering capabilities, Linux can grow with your business. In fact, Linux has set records in horizontal scalability (increasing capacity through clustering servers). In a recent TPC™-H benchmark test (a decision-support benchmark from the Transaction Processing Performance Council), DB2® running on Linux topped the 100GB database category with speeds of 2733QpH (query per hour performance matrix) — 60% faster than its closest competitor.<sup>5</sup>

## **Fact: Linux can scale to meet the demands of your business.**

Linux is also making strong advances in vertical scalability (increasing power in a single server) and currently supports 8-way processing, with 16-way and 32-way coming in the future. Other advances in the latest Linux kernel include support for faster networking and up to 64GB of memory; 32-bit user and group IDs; Logical Volume Manager capabilities; and raw device I/O without caching.

IBM is playing an important role in further enhancing the performance and scalability of Linux by supporting Linux on a variety of architectures. Linux runs on the entire IBM @server product line, providing a choice of platforms so customers can achieve complex workload scalability by combining the strengths of different architectures for scalable, cost-effective results. Specifically, customer applications can leverage combinations of Intel® Power or z/OS computing power so they can scale applications based on workload characteristics and computing requirements.

IBM is also enhancing Linux through our renowned supercomputing technology. IBM Research is currently working on the Blue Gene project, which is developing a Linux-based supercomputer with tens of thousands of computing nodes capable of quadrillions of operations per second. As part of this project, IBM Research is working with a leading national defense laboratory in California to build the Blue Gene/L machine, which will have 512 nodes and be able to complete approximately 200 trillion operations per second. With these advanced capabilities, Linux offers the flexibility companies require to support their evolving business needs now and into the future.

That's why all kinds of IT organizations are choosing Linux and IBM for their massive computing challenges. The U.S. Department of Defense has clustered 256 IBM @server x330s to help it create more accurate weather forecasts. And, energy company Royal Dutch Shell achieved teraflop capacity by clustering over 1,000 xSeries™ servers with Linux. As noted by supercomputing expert Frank Gilfeather of the University of New Mexico, "Linux clusters are definitely the future of supercomputing and companies need to be able to see how this technology can help them."

**Where you'll find Linux: BBDO INTERACTIVE, Brookhaven National Laboratory, Dresdner Kleinwort Wasserstein and Dupont Photomask all use scalable Linux clusters for their computing challenges.**

# Linux: Skills



**A real Linux story:** “A talented and resourceful IT staff can quickly support Linux. With the help of IBM and the open source community, a portion of our IT staff has developed into Linux administrators and programmers.”

– Tom Fischer, *AVP Data Systems, GuideOne Insurance*

**A real Linux story:** “Tamkang University is committed to keeping Taiwan at the forefront of technological and academic excellence. The comprehensive Linux solution we are implementing with IBM will be vital to fulfilling that dual challenge.”

– Dr. Ming-Dar Hwang, *Chief Information Officer,  
Tamkang University Information Processing Center*

Want to make sure that you'll be able to get enough Linux resources to maintain your infrastructure? No worries: Linux skills are widely available. According to a TechRepublic survey in 2001, 50% of IT professionals surveyed said their organizations were confident they could support Linux.<sup>6</sup> And prestigious universities everywhere are producing students with exceptional Linux skills.

## **Fact: Linux skills and support are widespread throughout the IT community.**

Linux capabilities can also be easily developed from the UNIX® skills you and your staff may already have.

Because the two platforms share many core elements, experienced UNIX programmers can train to become Linux programmers quickly — often in a matter of weeks. To make it even easier, IBM Learning Services offers over 40 courses that can help you with the transition.

And if you'd rather not do it yourself, there are many other Linux support options you can choose from. Most Linux distribution vendors offer support services, as does our own IBM Global Services team. Our SupportLine for Linux provides 24x7 remote support from our trained engineers, and with hundreds of skilled Linux consultants worldwide, we can also help you design, build and enhance your individual Linux solution. With IBM Global Services, you can be confident that you will have access to the skills you need to help maximize the availability of your infrastructure.

**Where you'll find Linux: San Jose State University, Tamkang University, Warwick University and Marist College are just a few of the universities that are embracing Linux.**

# Linux: Ready for business



**A real Linux story:** “Linux on the S/390® allows us to consolidate in a very cost-effective way... with these applications running on the mainframe, we have higher availability and reliability and better performance.”

– Isaac Arismendi, *IT Infrastructure Manager, Banco Mercantil*

**A real Linux story:** “IBM DB2 for Linux offers the scalable, Web-ready database we need to deliver top-level performance and availability, at a total cost of ownership we believe to be at least 75% lower than that of any comparable solution.”

– Andreas Walter, *IT Manager, BBDO INTERACTIVE*

With solid performance and strong cost-effectiveness, Linux is ready to run the most demanding enterprise infrastructures. Just look at the results Linux has achieved: According to a 2001 study by the Standish Research Group,<sup>7</sup> downtime in a clustered Linux environment was less than half that of Microsoft® Windows®. Recent research from the Tower Group also found that compared to UNIX and Windows NT®, Linux has the lowest license, installation, administrative and support costs as well as the most flexibility and ISV support for certain business functions.<sup>8</sup>

## **Fact: Linux is ready for all kinds of businesses — including yours.**

According to Dushyant Shahrawat, Senior Analyst for TowerGroup, “Based on our analysis of large securities firms’ experiences with Linux on Wall Street, Linux is proving to have an advantage over alternative operating platforms with a lower TCO (total cost of ownership), both in terms of lower hardware and software expense and ongoing maintenance and support. It provides a compelling value proposition and advanced features that can help firms improve their ROI, especially in certain functional areas.”<sup>9</sup> Whether you need an extremely reliable open infrastructure, highly distributed applications or a readily scalable clustered environment, Linux can meet your needs with an efficient and effective solution.

How do we know? Because we’ve done it. IBM Linux solutions power thousands of IT infrastructures across the globe, in industries including financial services, telecommunications, retail, media and entertainment, healthcare and more. Linux also powers our own enterprise: We run Linux on over 1,200 of our own corporate servers, including those supporting our Web site. As noted by José Carlos Ramos, e-business Manager, Aitana, SBS, “IBM @server, IBM software and Linux make an ideal combination for our hosting infrastructure, which we depend on to run and manage our customers’ mission-critical systems.”

Now that you know Linux is ready for your business, IBM can help you find out if you’re ready for Linux. The Linux experts at IBM Global Services can help assess your needs and determine exactly how your IT infrastructure could benefit from moving to Linux. It’s the flexible, reliable solution for the new demands of e-business.

**Where you’ll find Linux: The Industrial and Commercial Bank of China, Korean Air, Thrifty Car Rental and Warner Bros. are among the many companies using Linux to power their IT infrastructure.**

# Linux and IBM: The right choice for your business.

Linux has the advanced features companies need to quickly adapt to ever-changing business conditions and customer needs. That's why IBM has been supporting this important platform since 1998. More than 5,000 IBM employees are working on Linux worldwide and we've been able to make significant contributions to Linux kernels 2.4 and 2.5.

IBM Linux experts participate in numerous Linux organizations and development initiatives and we have become a valued member of the Linux community. According to Forrester Research Analyst Ted Schadler, "IBM has embraced open source software to unify its diverse product line and give customers a choice and control over costs."<sup>10</sup>

You can see the depth of our commitment in our product offerings. IBM has more Linux-related products and services than any other company. All our server platforms run on Linux; all key IBM middleware products run on Linux; over 4,700 IBM Business Partners now support Linux; and there are currently over 4,000 Linux applications listed in the IBM Global Solutions Directory, which are available through IBM Global Services and our Business Partners.

- **Infrastructure solutions:** With strong reliability, low cost and support across the IBM software portfolio, Linux can run infrastructure servers used for file serving/printing, Web hosting, application development, security and more.
- **Workload consolidation:** Consolidating distributed UNIX or Windows NT-based servers onto IBM Linux servers can help all types of customers reduce costs, simplify infrastructure management and achieve higher levels of efficiency.
- **Distributed enterprise computing:** Linux brings strong cost advantages and eases administration for highly replicated server applications located throughout the enterprise in industries such as retail, distribution, insurance and banks with branch automation.
- **Linux clusters:** Through clustering Linux servers, IT organizations can now achieve supercomputing capabilities for a fraction of the price, allowing a wide range of companies to benefit from advanced computing powers previously only seen in scientific and technical installations.
- **Application solutions:** A solution that includes IBM middleware integrated with offerings from IBM Business Partners and ISVs can help companies implement industry-specific vertical applications quickly and cost-effectively.

Now you've got the real story on Linux. If you'd like to learn even more, visit our Linux resource center at [ibm.com/linux](http://ibm.com/linux) for case studies, whitepapers, information about IBM Linux products and more.

## Footnotes

<sup>1</sup> CIO Magazine's online poll, November 2002; reprinted through the courtesy of CIO.com; copyright 2002 CXO Media Inc.; All rights reserved.

<sup>2</sup> IDC Quarterly Tracker Report, 3Q 2002.

<sup>3</sup> SecurityPortal, Jim Reavis, "Linux vs. Microsoft: Who Solves Security Problems Faster?," January 17, 2000; Jim Reavis, copyright 2003, <http://csoinform.com/research/solve.shtml>

<sup>4</sup> Evans Data Research Studies, "International Developer Survey," November 2001 and "North American Developer Survey," August 2002.

<sup>5</sup> Transaction Processing Performance Council, [www.tpc.org](http://www.tpc.org) The TPC-H is a decision support benchmark. Four-node SGI 145 server, with each node featuring four Pentium® III Xeon™ processors @ 700MHz with 4GB of memory; SGI's ProPack 1.5 performance add-on, IBM DB2; RedHat 6.2 running Linux 2.4.3.

<sup>6</sup> TechRepublic, Bob Artner, "Research Shows Linux Support," November 6, 2001; [www.techrepublic.com](http://www.techrepublic.com)

<sup>7</sup> Standish Group, a research and consulting firm, conducted their own research that showed Linux servers have about 14 hours of downtime per year versus Microsoft Enterprise Cluster at about 30 hours of downtime per year. This information was published in an *Information Week* article: "IT Managers Become More 'Open,'" April 16, 2001.

<sup>8</sup> TowerGroup, "Wall Street Romances the Penguin: The Growing Popularity of Linux," by Dushyant Shahrawat, September 2002.

<sup>9</sup> TowerGroup, "Wall Street Romances the Penguin: The Growing Popularity of Linux," by Dushyant Shahrawat, September 2002.

<sup>10</sup> Forrester Brief, "IBM Wields Open Source as a Weapon," by Ted Schadler with Charles Rutstein, November 22, 2002.



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can do for you?**

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businesses everywhere.**



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IBM Corporation

Linux Marketing

Route 100  
Somers, NY 10589  
USA

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