

# Realize the benefits.

IBM, Linux and you: Real experience, real solutions...for real business



## *IBM and Linux: Real solutions for an on demand world*

Stable. Secure. Powerful. Flexible. And a major force in the real world of business computing. This is Linux<sup>®</sup>, the open-source operating system that is continuously being improved and fine-tuned. Today, IBM leads the industry in support for Linux in the enterprise, and we stand alone in our ability to deliver end-to-end Linux solutions.

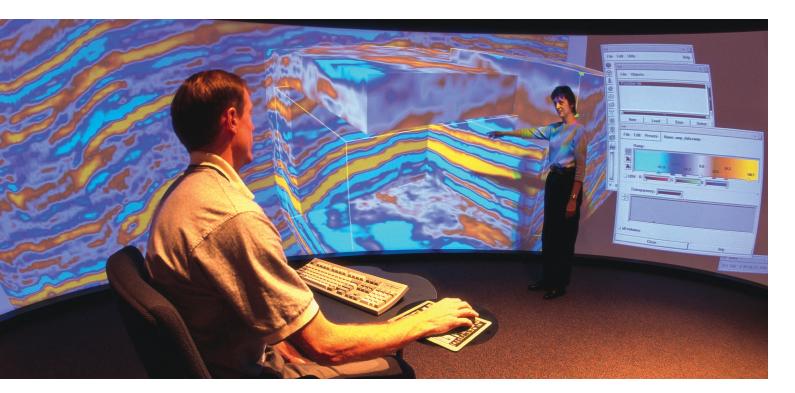
Because we deeply understand the attributes of Linux, we can help your business fully tap its strength. Linux is the very essence of the word "adaptive." Because it is open source, you can use it to integrate islands of technology—both boxes and business processes. So you can respond quickly to changing business conditions and focus on business requirements instead of grappling with the challenges of integrating closed architectures. In short: gain a competitive edge in the new on demand world.

By the way, these are not just empty words. IBM's total commitment to Linux and standards-based computing is borne out by the use of Linux in our own organization. By the close of 2002, IBM was already running Linux on over 1,000 production servers—and we will continue to add more. Our **ibm.com** Web site, as well as our intranet, are powered by many servers running Linux. And we use Linux to drive critical business applications—for example, we recently launched a new \$2.5 billion, completely automated chip manufacturing facility that runs on Linux.

IBM declared support for Linux and standards-based computing long before it was fashionable to do so. Since then, we not only have enabled Linux on our servers, software and services, we have made Linux a top priority across our entire business, investing in knowledge, technology and skills to bring real solutions to customers in all industries.



## Real experience means real expertise, and a partner you can trust



By the end of 2002, IBM had more than 6,300 Linux engagements worldwide, on solutions ranging from Web serving to some of the largest supercomputers doing seismic processing, financial calculations and genomic research. What's the key to this kind of success? It's not just hardware and software, it's the sheer scope of the services and support we offer—all from a single point of contact. When you choose a Linux-based solution from IBM, we can provide helpful advice, timely assistance, consulting, and technical support...so you can deploy your Linux-based solution with confidence.

#### **Comprehensive assistance**

We offer the industry's most comprehensive portfolio of Linux consultative and support solutions—from hosting for your Linux environment, to a complete technical curriculum available in 20 countries and five languages, to managed operations services—delivered by more than 2,000 Linuxskilled IBM Global Services professionals. And we can provide services to help you implement specific Linux-based solutions, such as clustering, workload consolidation, and middleware enablement, to help you optimize your return on investment.

"IBM has been a great partner. They've worked with us to put together a proven solution with Linux, the way that no other company has ever worked with us in the past."

Michael Prince, CIO, Burlington Coat Factory

#### Linux reality

- Linux is currently the fastest growing server operating system, with a projected annual compound growth rate (CAGR) of 35.6% through 2006, compared to a projected 14% CAGR for Microsoft<sup>®</sup> Windows<sup>®</sup>.<sup>1</sup>
- Linux is projected to surpass UNIX<sup>®</sup> in number of server shipments by the end of 2003.<sup>1</sup>
- Independent software vendors have created more than 4,200 Linux applications using IBM software.
- 34,000 Windows and Intel<sup>®</sup> developers have downloaded IBM software to help build Linux applications.
- The Linux zone on IBM developerWorks<sup>™</sup> is the most heavily trafficked zone on the site.
- All key middleware available from IBM—including WebSphere<sup>®</sup>, DB2<sup>®</sup>, Lotus<sup>®</sup> Domino<sup>®</sup> and Tivoli<sup>®</sup> supports Linux today.

Over 4,800 IBM Business Partners around the world are trained in Linux and Linux-enabled solutions—a broad base of expertise you can tap into for a highly customized solution designed to match your e-business needs.

Through IBM and IBM Global Services, we can bring you virtually unmatched comprehensive technical support services. SupportLine for Linux provides 24 x 7 enterprise-level remote support from trained engineers for fast and accurate problem resolution plus defect support for all major distributions of the Linux operating system. Simply turn to us for advice, or depend on our skilled specialists to supplement your internal staff.

But that's not all. Our technology expertise is matched by our industry knowledge—our years of experience combine with deep process skills in 18 different industries. So you can be confident that our solutions are backed by an understanding of your specific industry.

#### A focus on your strategy

IBM Business Consulting Services is a new division of IBM that combines the heavyweight in business consulting— PricewaterhouseCoopers Consulting—with the formidable executional force that is the whole of IBM. IBM Business Consulting Services brings an unusual degree of depth and experience to the strategic planning table. Combining our extensive business and industry expertise with our comprehensive Linux solutions—backed by real experience puts us in an outstanding position to help you develop and implement your Linux strategy.



## Getting down to real business: IBM and Linux in distribution and retail

Around the world, distribution companies are faced with growing challenges, including a requirement to reduce operating expenses, deregulation and privatization issues, and the need for a more customer-centric approach.

Together, IBM and Linux have opened the door to cost savings, increased revenue, improved customer service, and greater efficiency for distribution and retail companies. Linux-based solutions developed and supported by IBM are making a difference in areas that include reservations and scheduling, self-service kiosks, workload consolidation, and in-store operations.

One of the most exciting developments for IBM and Linux is in the point-of-sale (POS) arena. In retail, where margins are slim, cost is a major issue. Recently, retailers have been reluctant to upgrade POS systems even though they no longer meet their needs—or the needs of their customers. Some retailers' aging POS architectures can no longer be upgraded.

Enter Linux and IBM's POS solution. Linux's low cost, reliability, hardware portability, and easy replication, paired with IBM's high-performance POS platform, is making news. Our retail-hardened, pretested solutions make for fast implementation with low risk. You can even move your existing IBM SurePOS<sup>™</sup> systems to Linux without having to purchase new hardware. And because Linux is an open system, you have terrific integration capabilities plus easy upgradability—all in a small footprint.

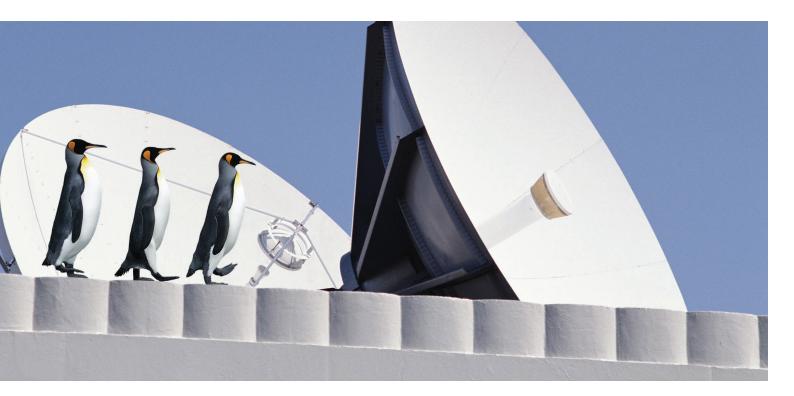


#### Case in point

Casas Bahia is one of the largest retailers in Brazil. Struggling with an outdated DOS-based POS platform with no upgrade path, the retailer called IBM. The answer was a Linux-based solution on 1,200 IBM POS devices. IBM offered a total solution, including installation and training, and the company gained increased functionality and greater flexibility and security. Today, Casas Bahia is so taken with its Linux-based solution that it plans to create a Linux-only store.

Linux offers meaningful benefits for retail and distribution. And IBM has the expertise to get you into a Linux environment. We combine more than 20 years of experience in the retail arena—including the best-selling POS solutions—with industry-leading support and knowledge of Linux.

## Real solutions that deliver immediate business value



In all industries—including telecommunications, geophysical sciences, financial services, distribution and retail, government, life sciences, computer-aided engineering and design—the economics of Linux are simply overwhelming. That's why we're focused on providing our customers with real solutions that range from infrastructure and application solutions to workload consolidation, and from high-performance computing to distributed applications. Not only do we know Linux, we know what our Linux customers want.

#### Run-the-business solutions

Linux infrastructure solutions such as Web serving and file serving are already widely accepted throughout the business community. Now, more and more software vendors are working to provide the run-the-business solutions you are asking for. The number of available applications for Linux has grown exponentially in the past year, while thousands of developers are hard at work on the next wave. We are working with our IBM Software Business Partners to provide you with affordable, integrated Linux solutions that can help you run your critical business processes. These optimized Linux solutions can reduce implementation time, promote efficiency and speed time to market. eOneGroup was called upon to help Tommy Hilfiger expand its presence among retailers, manufacturers and employees. The answer was a B2B portal running on Linux. IBM and IBM Business Partner eOneGroup put together a solution based on IBM iSeries<sup>™</sup> and xSeries<sup>™</sup> servers running Linux, IBM DB2 and Java<sup>™</sup>, plus eOneGroup's B2B portal software. Now, specialty retailers can view available inventory and place orders in real time, while worldwide production facilities are linked. The solution has helped Tommy Hilfiger lower costs and increase revenue.

#### High-performance computing and clustering

Many complex, compute-intensive workloads—seismic processing, computer animation, high-performance computing—traditionally ran on expensive, proprietary platforms. Now, with the help of IBM, customers are running them on clusters of low-cost Linux servers—reliable, Intel-based IBM xSeries systems. Linux really shines at horizontal scalability—in fact, it sets records for this type of performance.<sup>2</sup> Put Linux together with our factory-installed clusters and file management technologies, plus our comprehensive service and support, and you've got a highly scalable solution with a low total cost of ownership that can be set up quickly and administered with ease. In short, supercomputing performance at mass market prices.

And even if your computing needs don't call for computeintensive workloads, you can put a small Linux cluster to work to provide high availability for your applications.

"IBM @server systems, software and Linux make an ideal combination for our hosting infrastructure, which we depend on to run our customers' mission-critical systems." It's no wonder that companies from sectors as varied as petroleum to financial services to Hollywood are asking IBM to help them exploit this capability for competitive advantage the cost savings and performance benefits are hard to ignore. For example, DuPont Photomasks is a microimaging company that makes complex photomasks for printed circuits. By moving its computer-aided transcription application to a small cluster of ten xSeries servers running Linux, processing power improved by more than 50 percent over the previous Windows NT<sup>®</sup> platform. Plus, the company now has a scalable environment for running larger routines, with runtimes reduced from days to less than 24 hours.

#### Branch and store operations

Linux has really taken hold as an in-store operations platform—for banks and other branch outlets spread across a large number of geographically diverse locations, as well as government field offices, such as postal services. The reasons are compelling: Linux offers significant economies of scale for companies that are deploying servers at hundreds to thousands of locations. Its high reliability and stability are ideal for stores or branches with no technical staff. It is easy to replicate and manage across an enterprise. And Linux solutions from IBM are backed by our worldwide support and implementation expertise.

A large home decorating firm came to IBM to help re-automate its U.S. stores—more than 2,600 of them. We're putting two IBM NetVista<sup>™</sup> PCs running Linux in each of the stores for in-store processing, plus Internet access and office productivity tools. Two IBM @server xSeries servers run the operation. The new solution not only provides higher availability and better price/performance than their previous solution, it gives the company new functionality with fewer administrative support requirements.

Jose Carlos Ramos, e-business manager, Aitana

#### Our investment in Linux

- IBM has Linux-enabled its entire portfolio of hardware, e-business software and services.
- The IBM Linux Technology Center is home to 250 IBM software engineers who are making significant contributions within the open source community to further develop the enterprise capabilities of Linux.
- IBM has more than 5,000 employees devoted to Linux development, research, services and more.
- IBM ships more than 65 software products for Linux across our IBM DB2, WebSphere, Lotus and Tivoli software families.
- Internally, we run Linux on more than 1,000 servers, including those supporting **ibm.com**.
- IBM Linux Integration Centers help you design and deploy your Linux solutions. We provide technical consulting, proof of concept, benchmarking and more.
- IBM Government Solutions Centers bring IBM experts and the public sector together to explore e-government solutions, including Linux-based solutions.
- Industry Centers of Competency assist you with Linux expertise and porting; two new centers in London and New York focus on Linux solutions for financial services

#### Consolidating workloads

IBM has already attracted a lot of attention with Linux workload consolidation solutions, especially on the IBM zSeries<sup>™</sup> platform. The news today is that workload consolidation is now a reality across all our server platforms, thanks to IBM virtualization technology. By consolidating the workloads from a number of distributed servers onto a single zSeries, iSeries, pSeries<sup>™</sup> or xSeries machine, you can achieve substantial savings and a simplified environment while gaining increased flexibility to meet future demands.

With help from IBM, a European telecommunications firm consolidated 70 Sun servers onto a single zSeries running Linux. While increasing availability, security and long-term scalability, they realized significant savings in operating costs, including a 50 percent reduction in energy consumption.

"We chose Linux on the iSeries because it was a compelling alternative to the cost and complexity of managing nine separate Intel-based servers."

Nigel Fortlage, Vice President of IT, Geo. H. Young and Co. Ltd.



## Getting down to real business: IBM and Linux in financial services

In these lean times, the challenges for financial services firms are many. Key is providing the technology and products customers want while cutting costs. Linux, together with solutions from IBM, offers a fast, effective, low-risk option to cut IT budgets. Customers in retail banking, insurance and the financial markets are harnessing Linux-based IBM solutions for online banking and brokerage, portfolio analysis, and infrastructure solutions like workload consolidation.

Linux clusters for computational finance, such as risk management applications, have taken the industry by storm. Companies are experiencing dramatic performance advantages combined with significant cost reduction. For example, one customer's hedge fund management application now runs more than five times faster at a fifth the cost, after migrating to IBM Linux clusters.

Today, the emerging application for financial services is branch renewal. Companies are already harnessing IBM and Linux to deploy hundreds of distributed servers at minimal cost, and our new E2E Branch Transformation solution takes this even further, offering greater functionality and integration across the enterprise.

Retail banks looking to save money have allowed branch systems to age, yet the drive to bring in new customers by offering new services is strong. Based on a WebSphere stack that you can leverage to create your own retail solutions, E2E enables thin clients for reduced infrastructure costs in branches, controlled by Linux on the mainframe for core banking applications. This affordable, integrated IBM solution for Linux can help financial services firms reduce cost, implementation time and risk.



#### Case in point

One of the largest banks in South America is in the process of transforming its network of 8,500 branches with help from IBM. Each branch will be powered by two servers running Linux, WebSphere and MQSeries<sup>®</sup>, with teller terminals and ATMs also being moved to Linux. IBM Global Services has ported the bank's existing applications to Linux, and completion of the full branch rollout is targeted for the end of 2003.

Our support for Linux is unmatched, and our solutions for financial services are based on our longtime involvement with the industry. And now, we'd like to share our expertise with you. We've created Linux Centers of Competency in two of the world's hubs of finance: New York City and the City of London. Here, you can gain a better understanding of Linux and what it can do for your financial services business.

## Real innovation



The breadth of our Linux-related products and services is unsurpassed. But it is the depth of our technology expertise that provides the power behind our solutions. Today, we support Linux on all our server platforms—xSeries, iSeries, pSeries, zSeries. And we continue to innovate: We introduced the world's first dedicated Linux mainframe, plus you can now take advantage of 64-bit performance with Linux on the new pSeries Linux-ready express configurations. What's more, IBM is paving the way for Linux in PDAs and smart phones with our new, low-cost PDA blueprint kit for developers.

#### Software for the on demand era

Middleware is often overlooked, but it forms a vital backbone for all your applications, and is the software that makes e-business work. Which is precisely why all key IBM middleware runs on Linux. IBM middleware not only provides rich functionality, it implements open standards, such as J2EE and Web services. In fact, we provide the most flexible and open platform available today for full-function Linux-based business applications—many of which are available from IBM Business Partners. You can access an online directory of these solutions—plus links to tools and services for Linux at **ibm.com**/software/solutions/isv. IBM DB2 Universal Database<sup>™</sup> is the robust, easy-to-manage database that complements the stability and reliability of Linux, while the IBM WebSphere platform for Linux lets you build, deploy and manage Web sites ranging from simple publishing to e-commerce to enterprise-scale transaction processing. And when you need flexibility, MQSeries and MQSeries Everyplace<sup>™</sup> can integrate Linux applications across 35 platforms, including laptops, mobile phones and PDAs. Our Tivoli solutions for Linux enable integration of Linux systems management with your existing infrastructure. And Lotus Domino and iNotes<sup>™</sup> offerings for Linux provide Web-enabled solutions that encourage smart collaboration among employees, customers, partners and suppliers. You can depend on IBM software expertise to help you build the robust environment for Linux that your business needs.

#### On the cutting edge: BladeCenter

Ideal for Linux clusters, the new IBM @server BladeCenter<sup>™</sup> allows you to intermingle and hot-swap Linux blades on demand, while continuously running blades with other operating systems. The modular design of the BladeCenter can substantially lower your IT infrastructure costs. Up to 14 blades (each a separate, very thin server) are housed in a high-density enclosure that simplifies remote management, speeds deployment and boosts scalability. Simply slide in another blade as your business needs evolve.

#### Advanced technology: IntelliStation

IBM IntelliStation<sup>®</sup> workstations are designed for your most critical business operations. Offering relentless reliability and a high-performance environment for Linux users, IntelliStation workstations are the professional tool of choice for engineers, media creators, software developers and financial analysts. With extensive graphics capabilities, IntelliStation provides a powerful platform for Linux applications, including digital content creation and electronic design automation. What's more, we work directly with leading software providers to certify applications on IntelliStation. The high reliability and cost-effectiveness of Linux, the robustness of IntelliStation, plus IBM global service and support creates a winning combination.

#### Linux on demand: Linux virtual services

If you'd like to tap into the benefits of Linux without investing in infrastructure, IBM Managed Hosting – Linux virtual services is the answer. Linux virtual services offers cost-effective managed server capacity on demand, without the upfront capital expense. Much like the physical Web, database and application servers you rely on now, you'll leverage virtual servers on a super-reliable IBM zSeries mainframe running Linux in a security-rich hosting environment. You pay only for the processing, storage and network capacity you need today, and can easily add more to handle peaks or as your needs evolve. Use Linux virtual services for the same tasks you'd use a physical Linux server—workload consolidation, to create an inexpensive Web presence, for your production workloads—even as a Linux sandbox.

"We chose DB2 running on Linux based on its stability, scalability and performance. There's almost no end to DB2's advantages."

Dr. Napthali Rishe Director, Florida International University High Performance Database Research Center A real commitment to the open source community Many IBM employees are trusted, valued members of the open source community, involved in Linux organizations, and responsible for significant contributions to the Linux 2.4 and upcoming 2.5/2.6 kernels. It's all part of our commitment to Linux—and our dedication to ensuring that Linux and open source software continue to meet the needs of business.

- The IBM Linux Technology Center was created to help make Linux even better. It is staffed by more than 250 of IBM's best developers around the world, all working solely on open source projects. Contributions of IBM technology to various open source projects, including Linux, cover innovations for scalability, high availability and manageability.
- IBM Solution Partnership Centers, located worldwide, are fully enabled for Linux. They help ISVs port applications to Linux, and test them using IBM middleware and servers in simulated environments.
- IBM is a founding participant and contributor to eclipse.org, dedicated to the creation of open source, multivendor, integrated software tools. IBM offerings, such as WebSphere Studio for Linux and our wireless portal solutions, are based on the Eclipse platform.

#### Into the future

Two innovations that IBM is quickly moving from the realm of future reality to present reality are Grid computing and autonomic computing. A Grid is a network of distributed computing resources that appear to an end user or application as one large virtual computing system. We recently introduced ten industry-focused Grid computing offerings that are based on our real experience with helping customers implement Grids—including Grids built on Linux.

Autonomic computing is a prerequisite for powerful Grids. IBM @server systems—already enabled for Linux incorporate rich autonomic capabilities that make them self-healing, self-configuring, self-protecting and self-optimizing. We've enabled other autonomic products to run on Linux, including IBM Tivoli management tools and IBM Director, which offers simplified central hardware management. And we're hard at work developing new Linux-enabled autonomic technologies, including Blue Gene<sup>™</sup> and Enterprise Workload Manager.

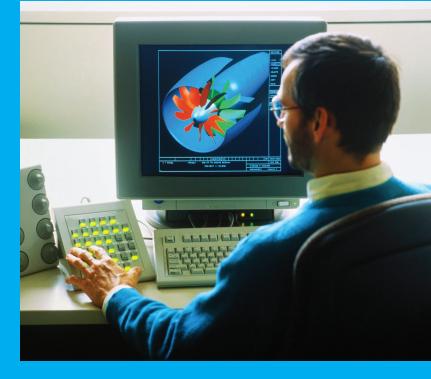


## Getting down to real business: IBM and Linux in the industrial sector

As a manufacturer, IBM is fully aware of the issues and challenges facing the industrial sector—we face the same challenges every day. In fact, through our Linux solutions, our colleagues in the electronics, chemical and petroleum, aerospace and defense, and automotive industries are benefiting from lower costs, higher performance and greater flexibility than ever before.

Many industrial companies are harnessing Linux solutions such as workload consolidation and Web serving that help them reduce IT complexity and costs. Others are exploring IBM Linux-based embedded solutions for wireless devices, PDAs, set-top boxes, and more. In fact, two giants of consumer electronics, Sony and Panasonic, recently announced their intent to develop an enhanced Linux platform for home electronic devices.

But it is in scientific and technical computing that IBM and Linux are really creating a revolution. For petroleum exploration and production, electronic design automation (EDA), and computer-aided engineering (CAE), Linux and IBM offer virtually unbeatable price/performance benefits as well as faster time to market. For example, increasingly stringent government regulations in the automotive industry have mandated a battery of tests, some of which are extremely time-consuming—and costly—to perform. Today, low-cost IBM clustering solutions running Linux are cutting turnaround times for applications like these from months to days.



#### Case in point

A large, global automobile manufacturer recently replaced its costly UNIX CAE automated design and crash-test simulation solution with a Linux cluster of IBM IntelliStation and IBM @server xSeries hardware implemented by IBM Global Services. The automaker not only saw improved performance, the IBM solution provided cost savings of 50 percent compared to the prior solution. The company chose Linux for its stability and lower total cost of ownership, and it chose IBM for the higher performance provided by IBM hardware, plus the level of service and in-depth knowledge IBM provides.

Perhaps the best proof point we can offer you is our own experience. IBM recently opened a new chip manufacturing facility that is run by Linux on xSeries servers. But, before we deployed it in earnest, we ran a three-month test. Linux ran all three months without any problems, whereas the longest the alternate platform went without crashing was five days. Add better performance and easier administration, and you can see why we—and so many of our customers—are choosing Linux solutions.

## Real partnership, for the real world



We are entering a new era in business—the on demand era. This new business model requires organizations to be flexible, adaptive and responsive to their customers on a global basis. Which in turn requires an operating environment built on open standards, that will allow you to ride the winds of change, quickly and cost-effectively.

Linux plays a key role in that operating environment, and IBM can help you make Linux an integral part of your enterprise. Only IBM offers the range of Linux solutions that it does today—solutions that can help you lead the charge in the brave new world that lies ahead. In the days to come, companies that have the right IT tools will be able to adapt to whatever changes the world throws at them—leaving those that are rigid and inflexible in the dust.

Are you ready? With IBM, you can be.

Learn more about IBM's solutions for Linux. Visit **ibm.com**/linux—you'll find a wealth of information and resources.

"Our new IBM @server xSeries servers running Linux are four times faster than the ones we replaced."

Josh Levine, CAO, E\*TRADE Group, Inc.

## Getting down to real business: IBM and Linux in government and public sector

The worldwide economic slowdown brings with it a shrinking tax base and a growing demand for government services. Health and life sciences firms must cut costs while they boost product development, and academic institutions must transform as education expands beyond the campus. Thus, as governments and the public sector around the world suffer increasing budget challenges, they are looking to do more with less. Linux solutions from IBM are helping them do just that.

e-government solutions, such as infrastructure and workload consolidation, are helping governments and academic institutions become more efficient. By integrating business processes across agencies and with legacy systems, these entities can cut costs while improving service levels. In the world of scientific research and defense, Linux solutions from IBM can harness the power of clustering and Grid computing for much higher performance and faster results at a lower price.

And in the day-to-day operations of government, IBM offers Linux solutions for field office operations that are creating a quiet revolution, boosting efficiency and improving service while slashing costs. With its consistency and scalability, Linux excels at distributed applications—for post offices, motor vehicle departments or social services offices. And IBM can provide complete solutions—from infrastructure to system design to integration—to help speed deployment.



#### Case in point

The Instituto Federal Electoral—Mexico's electoral authority—sought a cost-efficient IBM solution to replace manual vote counting at Mexico's 335 voting district offices. IBM implemented a nationwide intranet powered by 335 IBM @server xSeries servers running Linux—one for each voting district. Now, Mexico's 50 million registered voters can be assured of far greater security and accuracy, while election results are available much sooner.

At IBM, we've been serving government and the public sector for more than 75 years—in fact, these were some of our very first customers. As a result, we have a long-term view of your issues and needs. We also offer a wide range of solutions from Linux-based to traditional proprietary systems—so you can choose what is right for you. What's more, IBM has the largest number of experts worldwide working with government and the public sector full-time. You can take advantage of some of this expertise—and learn more about how Linux can play a part—at our IBM Government Solutions Centers.



### Making Linux a reality for your business

Let IBM help you get to know Linux—and put it to work for your business. Getting started is easy.

- Take a closer look at your own organization. You may already have Linux running on a Web server or in an offline development environment. Let IBM help you discover how you can expand the use of Linux to obtain its key benefits for your business.
- Pick a pilot. IBM Managed Hosting Linux virtual services is a great way to get started with Linux without having to invest in infrastructure.
- Contact your IBM representative or IBM Business Partner today for suggestions and solutions.
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IBM Corporation Linux Sales and Marketin Route 100 Somers, NY 10589

Printed in the United States of America 2-03

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- Printed in the United States on recycled paper containing 10% recovered post-consumer fiber
- IDC, Server Market Forecaster, September 2002.
  TPC-H benchmark results, 10/21/02; SAP SD 2-tier benchmark results as of 10/21/02.



G325-5483-01