IBM

IBM Systems and System Storage

Driving the New Enterprise Data Center

Blink and you may miss it—new technologies are revolutionizing the world of business faster than ever before. So how do you find the time and resources to drive the innovation required to keep your organization competitive in a rapidly changing marketplace? How can you react to business needs faster?

It is time to rethink IT service delivery. The IBM® strategy for the New Enterprise Data Center can help your company move beyond today's operational challenges to become better integrated, more efficient, dynamic and responsive to business requirements. By aligning technology and business, IBM helps provide the freedom and the tools you need to innovate—and stay ahead of the competition.

As technology has become more central to organizations in every industry, IT professionals have devoted an increasing percentage of their time to managing sprawling, complex, distributed infrastructures and an ever-growing explosion of information—all while striving to remain highly responsive to business and regulatory demands. Many IT departments are overburdened on a wide range of operational issues, from costs and service delivery to information risk management. What's more, businesses are being forced to become more energy-efficient in response to spiraling power costs and corporate directives.

Faced with the convergence of all of these challenges, companies often find it difficult to devote the time and resources needed to evaluate and leverage new technologies that could streamline their IT operations, respond to legal and regulatory requirements and help keep the company competitive and profitable. But your business cannot afford to let innovation pass it by. Increasing speed and availability of information is creating new opportunities to integrate services across the Web and re-centralize distributed IT resources. Instant access to trusted information,

real-time data and analytics is expected. Data centers will continue to get more powerful—and they will require systems, data, applications and networks that are always available, secure and resilient.

Your organization needs more than just better equipment to meet these challenges. Remaining competitive in the Web 2.0 era demands that business and IT leaders take a whole new approach to the data center. To better support the needs of the business, data centers must utilize new economics to drive IT efficiency, support rapid deployment of new applications, deliver IT as a service and work to analyze and integrate information in real time. These new requirements enable IT to provide information to users on their terms—when, where and how they want to see it.

A new approach to the data center

The IBM strategy for the new enterprise data center offers a new way of thinking about IT service delivery. This evolutionary model is designed to deliver dynamic and seamless access to IT services and resources, helping to improve both productivity and satisfaction through three key elements:

- **1. New economics.** The first step toward transforming the data center is simplification, which can help facilitate new levels of efficiency through consolidation and virtualization. It also can help facilitate integrated management and controls with enhanced resiliency, compliance and security. IBM believes that driving IT efficiency requires more than just incremental cost reductions. Dramatic improvements are possible when organizations consolidate data centers and infrastructure and begin to utilize virtualization across all system resources: servers, networks, disk, tape, SAN, file systems and files. By uncoupling applications from the underlying resources, companies can greatly improve application portability, enhance server and storage utilization, improve reliability and realize significant cost benefits.

- **2. Rapid deployment of services.** The second step toward data center transformation is supporting the reintegration of the data center and information with the development of shared services and leveraging highly virtualized shared resources. This impacts the ability to improve responsiveness and control service delivery quality.

  Improved service delivery capabilities help IT provide rapid deployment of new infrastructure and services through highly virtualized resource pools, optimized and converged networks and policy-based automated service management. IT infrastructures deliver more business value when they can support expansion and transformation, as well as scale rapidly in response to changing workloads—whether demands change by the month, the week, the day or the hour.

- **3. Tight alignment with the business.** In the third stage of data center transformation, companies become dynamic, highly responsive and business goal driven. By aligning IT with business goals, organizations can respond almost instantaneously to new business needs and be positioned to better drive innovation.

Dynamic IT organizations create opportunities to make better decisions based on information obtained in real time. Dynamic IT organizations deploy advanced management tools to automate processes and policies for end user requests of IT services. This can free technical resources from basic IT operational tasks, permitting more time to focus on higher-value tasks like IT-driven business innovation solutions. Dynamic IT organizations are better able to facilitate green IT initiatives, leverage embedded supercomputers, and deploy new forms of Web 2.0 delivery and real-time processing.

The results of taking a transformational approach to the data center are flexibility and freedom. Freedom for CEOs, who can rest assured that the IT department is ready to move into new business endeavors quickly and safely. Freedom for CFOs, who work daily to keep costs low and productivity high. Freedom for CIOs, who can be secure in the knowledge that customers are happy, systems are meeting key Service Level Agreements and IT is being leveraged to drive business innovation. Freedom for IT managers, who would rather work on supporting innovative

new business projects than focus purely on operational requirements. And finally, freedom for IT staff, who currently work extra weekends and holidays to minimize the business impact of maintaining inflexible solution stacks.

IBM Systems and System Storage: Enabling the New Enterprise Data Center

As organizations move toward a reintegration of the data center environment, a holistic integrated approach is the key to success. That is why IBM offers an approach that is built on real-world experience, embraces open standards and is supported by an ecosystem of technology partners.

IBM Systems and IBM System Storage™ products support the new enterprise data center strategy by delivering information infrastructure technology and expertise to help clients enable an evolutionary new model for efficient IT delivery. IBM technologies are designed to provide energy efficiency and advanced virtualization capabilities—helping to maximize return on IT investments and make new enterprise data center economics a reality. By breaking the barrier between IT resources and business services, clients can play a key role in supporting energy efficiency and

cost-reduction initiatives without impacting users. IBM virtualization and resource pooling technologies are critical in this effort. IBM solutions are green by design and offer scalable, balanced architectures to help manage costs, growth, complexity and risk.

Improving responsiveness through rapid delivery of services is another key capability delivered by IBM Systems. IBM service management features provide visibility, control and automation to deliver quality service at any scale—helping to reduce risk and allow flexibility for responding to business change.

Most importantly, IBM can help you drive innovation by aligning IT initiatives with business goals. Real-time integration of transactions, information and analytics supports the delivery of IT as a service—providing information to end users in the form and fashion that they want. IBM provides

the foundation for enhanced responsiveness and competitiveness. IBM Systems also enable virtualization across the IT infrastructure, which allows companies to configure "clouds" of IT resources for access and delivery of information in a timely fashion. Virtualization also can help reduce administration requirements and other IT expenses.

IBM System z: The cornerstone of the New Enterprise Data Center

Earlier this year, IBM introduced the latest addition to the IBM mainframe family of servers: the IBM System z10™ platform. With new capabilities that extend IBM System z™ leadership in enterprise computing, the System z10 is designed to extend the reach of System z to a broader set of workloads and play a pivotal role in the future of the data center.

System z delivers a broad set of capabilities to help businesses reduce IT infrastructure costs. Massive scalability and industry-leading virtualization and management combine to create a unique opportunity for large-scale consolidation. The new System z10 can help change the

operational paradigm by consolidating the workloads of many hundreds—even thousands—of distributed servers onto a single, highly energy-efficient centralized platform. The results can include substantial reductions in labor, facilities, software license and energy costs. In addition, System z can help address some of the escalating costs associated with downtime and security breaches through its leadership capabilities for security and resiliency.

In today's dynamic environment, it is imperative that IT infrastructures react swiftly to changing business requirements while maintaining outstanding service to the business and its clients. To meet these demands, System z offers capabilities designed to provide both the responsiveness and service levels required by today's enterprises. The System z10 combines massive scalability with a unique set of virtualization capabilities that allow the vast set of available resources—including processors, memory and channels—to be shared across applications. Industry-leading virtual management tools help administrators constantly reallocate these resources to meet changing

requirements. In this manner, organizations can help ensure that applications get the resources they need and that the appropriate service levels are maintained.

Having the freedom to react harmoniously across the business requires a flexible and responsive IT foundation. System z is designed to provide the foundational elements that can underpin the new enterprise data center. Through technologies designed to enable the automated provisioning and management of resources and services, System z can help match technology resource usage to business priorities.

In addition, System z builds upon a strong heritage of large-scale enterprise data serving. Its multi-workload design enables applications to be integrated with real-time data on a single server to provide an integrated resource to the business. Through this integration and automation of service delivery, System z provides an outstanding foundation from which companies can become more dynamic, highly responsive and business goal-driven.

IBM System x and IBM BladeCenter: Flexible building blocks to help align IT with business goals

IBM System x™ and IBM BladeCenter® servers are designed to help companies achieve new economics by improving energy management, helping to optimize performance, enhancing reliability and manageability and delivering potentially lower cost of ownership. IBM X-Architecture® technology—a blueprint for bringing innovation to x86 systems—marries powerful innovation from IBM Research with 40 years of mainframe experience to help improve energy efficiency while also helping to reduce IT complexity and costs.

X-Architecture provides the foundation for rapid service delivery through flexible configurations, enhanced memory and industry-leading availability and reliability features. By consolidating and virtualizing multiple physical servers on System x enterprise servers, companies can increase hardware utilization and decrease the number of physical assets needed to drive the business. And IBM Virtualization Manager—an extension of IBM Director middleware—can make virtualized server management even easier by providing a single interface to administer physical and virtual systems from almost anywhere.

Breakthrough offerings such as the IBM System x iDataPlex™ introduce a new category of systems designed to transform the way large-scale data centers are powered, cooled and equipped. With this new approach to data centers, IBM aims to cut the amount of power to the data center by 50 percent,[1] increase compute density by a factor of 10* and significantly reduce the need for the air conditioning required to cool a data center.[2] And iDataPlex is designed for eco-friendly deployment, since smaller server footprints require fewer resources for power and cooling.

With BladeCenter, IBM helps cut costs with technologies that are designed not only to help increase performance per watt, but also help you budget, plan and control power usage. Edison Group, an independent technology analysis and consulting firm, found that IBM BladeCenter H requires nearly 10 percent less power than the equivalently configured HP BladeSystem c7000. Extrapolated over 224 servers and with an energy cost of 9.4 cents per kilowatt-hour, this power savings can translate to up to US$12,000 per year.[3] What's more, the IBM BladeCenter E chassis configured with low-power components requires up to 30 percent less power than that same HP BladeSystem c-Class configuration.[4]

IBM Power Systems: The new power equation for the New Enterprise Data Center

Designed for the most complex computing challenges, IBM Power Systems unifies the integrated IBM System i™ platform with fast-growing UNIX® operating system platform IBM System p™. By uniting these two platforms under a single family, IBM is helping businesses move toward a new enterprise data center model while continuing to protect their application investments.

IBM Power Systems servers bring unprecedented performance and flexibility to UNIX, Linux® and i applications—enabling you to simplify and reduce operational costs, create a shared IT infrastructure and increase the resilience of your systems and applications. The platform is designed to help increase energy efficiency by delivering more performance per watt, offering support for workload consolidation and incorporating advanced tools such as Active Energy

Manager. IBM PowerVM™ virtualization technology and hot-plug server design help to enable rapid service delivery, while resiliency and redundancy features built into every Power System server help to enhance infrastructure resilience and ensure that the infrastructure can support business goals.

Built on IBM Power Architecture®, IBM Power Systems deliver new economics by supporting more than 15,000 AIX®, Linux on Power and IBM i applications for simplified operation. x86 Linux applications can run unchanged. In addition, you can simplify your IT infrastructure management by making workloads independent of hardware resources, thereby enabling the execution of business-driven policies to deliver resources based on time, cost and service-level requirements. Active Energy Manager enables you to get more performance per watt, consolidate energy-wasting underutilized servers and manage energy consumption. The PowerVM family of offerings also delivers

industry-leading virtualization on Power Systems. With these unique technologies, you can improve business responsiveness and operational speed by dynamically re-allocating resources to applications as needed.

To support rapid service deployment, better match changing business cycles and handle unexpected surges in demand, Power Systems Live Partition Mobility and Live Application Mobility tools enable you to move partitions or applications among servers to balance workload and performance requirements. Modular system design enables you to add Infrastructure capacity dynamically while applications are running, while IBM Director provides a single platform management interface that is designed for integration with Management Edition for AIX enterprise service management—delivering consistent, end-to-end management of physical and virtual systems.

Power Systems are also designed to increase application availability and simplify serviceability. By using a single virtualization technology—PowerVM—from top to bottom, companies can gain flexibility to move partitions or applications to optimize the IT infrastructure and support business goals. And for the highest level of protection in the event of failure or service degradation, Power Systems offers PowerHA™ solutions for AIX, i and Linux environments. Formerly known as IBM HACMP™ and IBM HASM, PowerHA solutions monitor the entire system and can quickly and automatically restart an application on backup hardware.

IBM System Storage: Information infrastructure for the New Enterprise Data Center

IBM System Storage is an important component of the IBM Information Infrastructure, which enables an evolutionary new data center model for efficient IT delivery. IBM System Storage platforms provide a resilient infrastructure for securely storing information and mitigating business risks. By leveraging IBM Information Infrastructure, clients can unlock the business value of their information for competitive advantage.

IBM Information Infrastructure helps clients enhance core capabilities that improve information service levels: information availability, information retention, information security and information compliance. These four capabilities drive service delivery—but if allowed to deteriorate, they can increase business risk. IBM best practices help clients manage both information service levels and information risk.

IBM Information Infrastructure products include a comprehensive breadth of disk, tape, storage network hardware and software for storage, security and information management. IBM virtualized storage solutions can simplify multivendor environments and increase storage utilization rates. IBM offers a consolidated storage management console that controls both IBM and non-IBM storage.

IBM Information Infrastructure services include Storage and Data Services, Server Services, Security and Privacy Services, Business Continuity and Resiliency Services and End User Services.

Integrated solutions from IBM include energy-efficient products that blend disk and tape technologies, storage virtualization, archiving, compliance, data mobility, de-duplication, thin provisioning, compression, remote site replication, virtual tape, scale-out NAS, data warehousing and encryption. Integrated solutions for IBM, Microsoft®, Oracle and SAP help drive availability, security, retention and compliance for critical business applications.

IBM takes a holistic approach to helping customers select the right mix of storage products and services. Information Infrastructure projects can be geared toward IT simplification, developing shared services and resources or building more dynamic IT environments. Customers can select a core capability to enhance—or they can design projects that address all four capabilities. IBM offers self-assessment tools, no-cost workshops and short-term consulting assessments to help customers get started with Information Infrastructure enhancement projects.

Industry-leading business consulting and technology services

IBM has made major investments in its services organization—IBM Global Services—to create one of the broadest services portfolios in the industry. IBM can help you solve real business challenges with end-to-end support and services for business continuity, virtualization, openness and collaboration. These services leverage IBM's deep technology knowledge, industry best practices, tools and methodologies to create innovative solutions for our clients.

As the world's largest business services company, IBM has more than 175,000 professionals working with clients in 170 countries, helping companies develop business and IT strategies, optimize business processes and manage business and information systems. With a strong focus on IBM Business Partner solutions and IBM integrated solutions, IBM Global Services offers strategic outsourcing services, integrated technology services and business innovation services. At IBM STG Worldwide Client Centers, IBM professionals leverage their worldwide technical expertise and that of business partners to meet clients' IT infrastructure goals and improve their overall business by demonstrating and presenting the capabilities of the IBM server, storage, and software portfolio. This is accomplished through a comprehensive approach that includes designing, developing, benchmarking and validating solutions, as well as delivering customized briefings and IBM's strategic messages that leverage subject matter experts in a professional environment.

Financing that supports the technology lifecycle

IBM Global Financing can help you accelerate your acquisitions of IT technology and services with affordable monthly payments. We help you to quickly and easily facilitate upgrades with minimal budget impact, refresh servers and storage solutions to avoid technology obsolescence, and remove and dispose of obsolete equipment—helping you reduce total cost of ownership and helping to make IT optimization initiatives more competitive and affordable. From acquisition through daily use, buyback and disposal, our end-to-end offerings form the foundation of a cohesive technology management strategy, improve asset management and increase your flexibility in small and large IT projects.

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For more information

To learn more about IBM products, services, financing and asset recovery solutions, please visit **ibm.com**/products/us.

³ SOURCE: Edison Group, November 2007. Blade Server Power Study.
ftp://ftp.software.ibm.com/common/ssi/rep_wh/n/BLL03002USEN/BLL03002USEN.PDF.

* http://www-03.ibm.com/press/us/en/pressrelease/23991.wss
Gary Shanshoian, Michele Blazek, Phil Naughton, Robert S. Seese, Evan Mills, and William Tschudi, "High-Tech Means High-Efficiency: The Business Case for Energy Management in High-Tech Industries." 5X density achieved using IBM Rear Door Heat Exchanger and Intel's latest Quad Core Xeon processors. iDataPlex uses 40 percent less power than typical 1U servers.

⁴ http://www-03.ibm.com/systems/bladecenter/news/power/
SOURCE: Edison Group, November 2007. Blade Server Power Study.
ftp://ftp.software.ibm.com/common/ssi/rep_wh/n/BLL03002USEN/BLL03002USEN.PDF

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