



Make it simple.

*Virtualization solutions help take the cost and complexity
out of your IT infrastructure*

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Executive summary

Revenue growth. Many of today's CEOs say it's their number-one priority. In fact, four out of five CEOs now believe that revenue growth is the most important path to boosting financial performance.¹ As CEOs and their companies make the transition from penetrating cost-cutting measures to innovative growth strategies, there's a renewed focus on employee productivity and on making the most of investments in existing resources.

But unpredictable growth (i.e., not knowing how much or when) can be a CIO's worst nightmare. To support business priorities, your IT infrastructure needs to have the speed, flexibility and resilience to handle a broad spectrum of challenges—without any additional IT funding. Unprecedented customer demand. Ever-changing business conditions. Even emerging opportunities. Your infrastructure needs to be ready to take action.

This executive brief will discuss how your organization can overcome some of the challenges impeding you from reaching your top-line goals. To succeed, you'll need to simplify your IT environment—within your company and across your supply chain. The key to that simplification is virtualization. By extending the virtualization capabilities you have today, you'll be better positioned to take advantage of all the benefits that On Demand Business has to offer.

The winding road to complexity

Your IT team is confronted with a series of challenges: How to quickly realize return on investment. Find—and retain—talented, qualified staff. Deliver the levels of system performance your employees need and your customers and partners demand to maintain a competitive edge. But complexity is likely the most significant barrier to building the IT environment you need to support your growth objectives.

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Your IT infrastructure didn't become complex overnight; it was an evolutionary process. Perhaps your business started small, and you installed enough servers to support a modest staff and a small number of business applications. Then your business took off. Or maybe your business was big and got bigger. You had to add more servers, more storage and more applications to support the load. The speed of the acquisition cycle increased. Thoughtful, your IT staff looked to the future, sometimes adding extra servers and storage in the event of a potential increase in demand.

Regardless of your size, soon your resources were scattered across a variety of operating platforms and around the world in multiple physical locations. Proprietary technologies and lack of open standards foiled integration, interoperability and unified management. Without a unified management view of your resources, your IT team struggled to keep up, redirecting their focus from your business priorities.

A major factor that impacts the cycle is aversion to change. Whether it's a conscious or unconscious choice, the *we've-always-done-it-that-way* attitude and outdated processes can have an effect on your bottom line. It's a treadmill: the need to solve a business problem; finding or developing an application that hopefully solves the problem; building an environment around a solution that's disconnected physically and/or logically from other systems. The process repeats itself over and over. The very existence of these disparate systems triggers new problems—such as security, accessibility, performance—that, in turn, require new applications and investments. To refocus energies on your business objectives requires a cultural shift and logical processes to support the change.

Two-thirds of the more than 450 CEOs surveyed expect growth to come from new products they'll develop over the next five years, with more than half expecting to enter new markets in search of growth opportunities. Asia and China, in particular, were cited as key new markets for revenue growth.²

—The Global CEO Study, IBM Business Consulting Services, June 2004

On Demand Business defined

An On Demand Business is an enterprise whose business processes—integrated end-to-end across the company and with key partners, suppliers and customers—can respond with speed to any customer demand, market opportunity or external threat.

Complexity has a price tag

IT complexity can have profound, negative business consequences. The investments in hardware and software—combined with the costs of resources to maintain them—are staggering. There's no way to accurately determine your total cost of ownership or to calculate how rapidly—or if—you recouped your return on investment.

Costly inefficiencies can erode your bottom line: You may be underutilizing your systems by not taking full advantage of their performance capabilities. Maybe you've over-scaled by investing in resources you don't really need. Or perhaps you've under-scaled, so you're not able to respond to spikes in demand because your system resources are already at capacity. You can't readily determine what resources you have available, so you can't allocate them according to business need. The obvious counter to complexity? Simplification.

Virtualization: realize the value of your infrastructure

Simplifying your IT environment can be a critical step toward becoming an On Demand Business. You've probably made attempts at simplification before: server consolidation, remote management, hosting and other approaches, but they didn't entirely solve your complexity problems. A millennial leap beyond these approaches, "Virtualization is the process of presenting computing resources in a way that users and applications can easily get value out of them, rather than presenting them in a way dictated by their implementation, geographic location or physical packaging. In other words, it provides a logical rather than physical view of data, computing power, storage capacity and other resources," says Jonathan Eunice, Illuminata.³

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Virtualization enables your IT team to manage multiple, unlike systems. Dynamically deploy and optimize your IT resources in real time. And take a holistic, open-standards-based approach to managing your infrastructure. One that's transparent to users. For your business team, virtualization lets you share resources—like servers, software and storage—to increase business flexibility. Improve service levels. And help reduce costs.

Virtualization can give you new capabilities that change:

- How you view your resources
- How you allocate resources—and add new resources—in response to change
- How you manage your data throughout its lifecycle, aligning cost with business value.

So you may:

- Lower the costs of maintaining your existing infrastructure and your total cost of ownership
- Improve flexibility to change processing requirements at a moment's notice
- Improve manageability by having data at your fingertips to make better decisions about your infrastructure requirements
- Safeguard data through world-class security and reliability features that have checks and balances to help you rest easy
- Centralize management, enabling your administrators to spend more time supporting your key business strategies
- Optimize how your assets are used to increase responsiveness while helping to save money
- Leverage a simplified and responsive infrastructure to get ready to tackle future challenges and capitalize on future opportunities.

Effectively managing your infrastructure can give you a business advantage. What do you need to consider?

People

- The growing number of staff needed to manage it
- The education and skill levels needed to support it
- The impact of staff turnover on maintaining it

IT processes

- Existing processes that can't support current complexity or speed of change
- Manual processes that increase error rates
- Point solutions that are stopgap measures to problem resolution

Technology

- The explosive growth of the number of devices you need to support
- The need to efficiently manage unlike environments
- The reintegration of network management

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"IBM Virtualization Engine has the potential to be a very powerful initiative that could give IBM an important advantage over its server, storage and management competitors."⁴

—Tom Kucharvy, Summit Strategies, June 2004

Gartner, in fact, has estimated that virtualization could result in an overall cost reduction of 15–30 percent, in addition to what can be achieved through consolidation.⁵ At IBM, we believe that our approach to virtualization enables IT to be more responsive to the changing needs of an On Demand Business.

A leader in virtualization technologies for more than 35 years, IBM can deliver rapid time to value, with the innovative solutions you need to leverage and extend the virtualization capabilities you already have. Supporting your On Demand Business transformation today.

Leverage and extend the capabilities you already have

Like most businesses, you probably already have some basic virtualization technologies incorporated into your existing infrastructure. Your IT team manages systems—such as mail servers, Web applications and storage area networks—as pools of like resources. Through virtualization, you can reduce the number and complexity of existing pools of similar resources to:

- Increase system availability
- Help reduce costs and increase the utilization of your existing assets
- Make infrastructure changes—without disrupting your users
- Improve your administrators' productivity
- Strengthen the resilience of your environment to meet challenges or take advantage of opportunities.

BT Conferencing always-on meeting services drive satisfaction

When you're connecting millions of users, you need to be up and running 24x7. Providing infrastructure support for audio, video and Web conferences, United Kingdom-based BT Conferencing (BT) brings people together globally, offering additional services that include bandwidth allocation, scheduling, financial reporting and business information services.

IBM @server® pSeries® and xSeries® systems supported BT's user base. Initially, each server contained its own storage, making it difficult for BT administrators to reallocate storage on demand. That meant some servers had plenty of storage, while others were at capacity. Moving or adding storage became a costly, time-consuming process that dictated bringing systems offline. And that impacted user satisfaction.

The solution

A storage area network built on IBM TotalStorage® DS4000 (formerly IBM TotalStorage FASTT700) Server with IBM TotalStorage SAN Volume Controller enables BT to meet its commitments to customer service excellence.

The gains

Cost savings, performance and flexibility increases, and reduced downtime. "By moving to virtualized storage using our IBM solution, we have the flexibility to allocate storage in the exact quantities required, with no wastage, and we are not subject to individual system capacity constraints...the solution has completely revolutionized the way we use our storage," says Bob Tetstall, systems administrator, BT Conferencing.



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“Virtualization capabilities available now in IBM @server systems can reduce complexity and five-year overall IT costs by up to 47.5%.”⁶

*—International Technology Group,
January 2004*

As a result of solutions supported by open standards, your IT team can also now consider moving toward single-view management of unlike systems and resources. Whether dealing with different processors or different operating environments, IBM virtualization solutions can help:

- Further improve utilization rates
- Increase flexibility of your resources and their allocation
- Cut management costs
- Speed time to value for new functions and users.



Australian Open: turning a demanding sport into an On Demand Business

One of professional tennis's venerable Grand Slams, the Australian Open is Tennis Australia's most visible, strategically important and valuable asset. Last year it attracted more than half a million spectators courtside, nearly 11 million visits to its official Web site and a television viewing audience from 187 countries. The Australian Open ensures that players, fans and media worldwide get the information they want—real-time scoring, news and match statistics—when they want it.

The solution

An infrastructure that can scale up to handle more than 80 times its regular traffic, and then scale down once the tournament is over. IBM Tivoli® Management software monitors application and platform performance and automatically allocate resources as needed; IBM WebSphere® Business Integration Event Broker software enables fast delivery of scores to users; IBM @server pSeries (IBM AIX® operating system) and xSeries systems running in the Linux® operating environment scale to handle large fluctuations in traffic; and an IBM BladeCenter™ system supports scoring.

The gains

A scalable, highly responsive infrastructure that complements Tennis Australia's existing systems—without the need for large capital investments in technologies. An infrastructure that helps improve utilization rates while helping to minimize costs. "This on demand solution from IBM enables Tennis Australia to focus on its core business goal—to promote and develop the growth of tennis throughout the Asia-Pacific region and maximize the return on investment," says Paul McNamee, tournament director, Australian Open.

Create a fabric of resources

Think about weaving together all the resources in your infrastructure into a single virtual fabric. A fabric that creates a resilient, flexible foundation that can automatically sense and respond to internal and external changes and demands in your business environment. Spot trends that could lead to costly downtime. Heal itself when disruptions occur. And streamline operations while dynamically aligning itself with your business priorities. By managing itself, your infrastructure fabric can help increase efficiencies and simplify resource allocation. And it should be totally transparent to your users.

With a virtualization fabric from IBM, you can:

- Realize enterprise-level business resilience governed by your business objectives
- More accurately enforce service-level agreements through provisioning
- Exploit your business logic and data into business rules-based service-oriented architectures.

Grid computing applies resources from many computers in a network—at the same time and regardless of the underlying platform—to a single problem. That problem might be about predicting financial risk, engineering a new car model or discovering a new drug. Grid participants not only gain access to greatly enhanced computing power, but they use only the resources they need, when they need them—helping to maximize asset utilization and employee productivity. Because the power comes from existing computers, there's often no need to buy new hardware.

Grid computing hides network complexity, allowing multiple users to share and collaborate through a unified interface. But grid computing goes beyond enabling communication to fostering real-time collaboration that supports common business goals and streamlines processes. Grids allow users to share files and can facilitate many-to-many sharing of other resources—such as data and software—to accelerate workflow in data-intensive environments.



First National Bank of Omaha counts on its simplified infrastructure

Deregulation. Mergers. Acquisitions. Banking industry consolidation has laid the groundwork for mammoth, complex banking organizations. Despite increasing competition and industry trends, First National Bank of Omaha (FNBO) remains one of the largest bank holding companies west of the Mississippi. Very proud of its 150-year tradition of providing personalized customer service and innovative, quality products, FNBO recognized the need to set a systems strategy to help ensure continued success.

The bank's highly complex infrastructure reflected industry complexity; nearly 600 servers ran Web-based banking and office applications. Difficult to monitor, maintain, upgrade and scale to meet varying needs, the infrastructure was unwieldy, and processor and storage utilization hovered between 12 and 14 percent. All of these factors resulted in an escalating total cost of ownership.

The solution

A consolidated infrastructure of 70 blade servers using two IBM BladeCenter systems reduces the number of FNBO's physical servers and the staff required to support them by more than 60 percent. Fewer network connections to safeguard means increased network security and lower costs. An IBM **@server** zSeries® system running virtual Linux servers provides capacity when it's needed most.

The gains

FNBO now has the ability to handle peak, seasonal processing—without having to purchase potentially underutilized computing assets—through IBM Capacity on Demand features and pay-as-needed pricing model. High reliability now supports FNBO's online banking services, increasing customer satisfaction while streamlining costs. "We're seeing real benefits as we move forward through the stages of virtualization," says Kenneth Kucera, senior vice president and division head of enterprise technology services, First National Bank of Omaha. "We're looking forward to exploiting provisioning and other capabilities to manage our multiple systems more as one, using the same people skills across those multiple systems."

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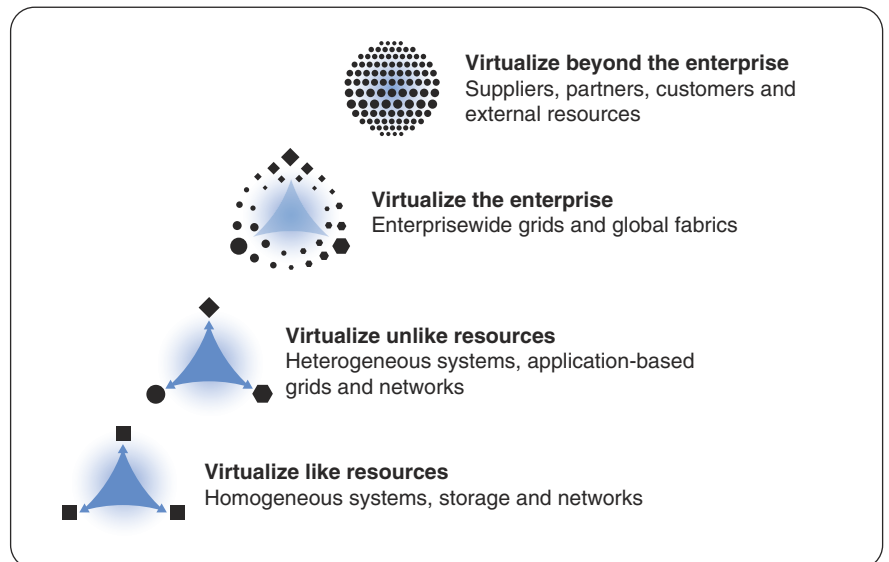
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Exploit the resources you need, whenever you need them

Your business may require more resources than you want—or can afford—to keep in-house. To help ensure that you can deliver, you can leverage owned and virtual resources beyond your enterprise to meet demand. You don't have to pay for excess resources just in case you might need them. Much like purchasing electricity, telecommunications or water—by the flip of a switch, the push of a button, the turn of a knob or the click of a mouse—you can add resources as your business needs dictate. Through IBM virtualization solutions, you can:

- Add to non-owned resources seamlessly
- Scale your costs according to your requirements
- Integrate existing business processes and service-level agreements.

Virtualization solutions: stages of deployment



Implementing virtualization solutions in your organization doesn't mean you need to change your entire IT environment in a single, large-scale reengineering project. The deployment stages shown above reflect how some IBM customers have integrated virtualization solutions today and a map for how they plan to adopt virtualization technologies moving forward.

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IBM virtualization resources help simplify your infrastructure

	Virtualize like resources	Virtualize unlike resources	Virtualize the enterprise	Virtualize beyond the enterprise
Servers				
IBM @server zSeries systems (with integrated IBM Virtualization Engine™ systems technologies)	•	•	•	•
IBM @server pSeries systems (with integrated IBM Virtualization Engine systems technologies)	•	•	•	•
IBM @server iSeries™ systems (with integrated IBM Virtualization Engine systems technologies)	•	•	•	•
IBM Virtualization Engine Suite for Servers	•	•	•	•
IBM Virtualization Engine systems technologies	•	•	•	•
Storage				
IBM TotalStorage SAN Volume Controller	•	•	•	•
IBM TotalStorage Productivity Center	•	•	•	•
Software				
IBM Tivoli software	•	•	•	•
IBM WebSphere software	•	•	•	•
Education and services				
TConow! (CIOview Corporation)	•	•	•	•
IBM Grid Toolbox		•	•	•
IBM Virtualization Engine services		•	•	•
IBM Start Your Engines education and training		•	•	•
IBM Global Services IT Systems Rationalization Study			•	•
IBM Supercomputing Capacity on Demand Centers				•
IBM Global Services Business Solutions				•
IBM Global Services Universal Management Infrastructure				•



Locus Pharmaceuticals accelerates cures with Capacity on Demand

Unrelenting demand for innovative drugs and treatment options places intense pressures on discovery labs to work faster—and more efficiently. Pennsylvania-based Locus Pharmaceuticals (Locus) develops novel, small-molecule therapeutics that address critical needs for HIV/AIDs, cancer and arthritis/inflammation. A key goal? To reduce the time to develop new medicines, in some cases, by years.

Surges in activity placed a heavy strain on the company's computing system. Expensive to operate and with an estimated life span of only another 12–18 months, combined with mounting, unpredictable workloads with external partners, Locus' system had limitations that impeded the company's ability to pursue more disease targets.

The solution

A variably priced IBM Deep Computing Capacity on Demand solution featuring an IBM @server xSeries Cluster 1350, including disk storage, network infrastructure, software and services, to help increase research capacity and organizational efficiency. The solution is housed at the IBM Deep Computing Center in Poughkeepsie, New York.

The gains

Access to supercomputing power whenever it's needed, paying only for the resources used, reducing infrastructure and operating costs. Algorithms are processed 100 times faster than before, enabling Locus scientists and colleagues to view computational data in near real time, increasing productivity. "The combination of increased speed and access to computing power has expanded our project capacity by a factor of four, allowing us to consider even more critical disease targets," says Jeff Wiseman, vice president of technology and informatics, Locus Pharmaceuticals.

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Getting started

You've already identified your On Demand Business strategies. And growth is likely at the top of your list. To succeed, you know you'll need to build an IT infrastructure capable of supporting your growth objectives. And that means making it simple. IBM offers virtualization technologies that can take the complexity out of your infrastructure. That let you determine what you already have and leverage it. With innovations that let you begin with virtualization basics and extend to incredible supercomputing processing power. A leader in virtualization technology, IBM provides a complete portfolio of hardware, software and services solutions that can help reduce your risk, promote productivity and let you do business efficiently and cost-effectively in today's on demand world.

For more information

To learn more about how virtualization technologies from IBM can help drive your growth strategies, please visit:

[**IBM Virtualization Solutions**](#)



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References to "utility" in this document reflect industry usage and are not intended to suggest that any on demand services are similar to public utility services for purposes of governmental regulation.

^{1,2} International Business Machines Corporation. IBM Business Consulting Services. The Global CEO Study. June 2004.

³ Eunice, Jonathan. "What is Virtualization?" Illuminata. March 5, 2003.

⁴ Kucharvy, Tom. "IBM's Virtualization Engine: A Solid Foundation for the On Demand World." SummitVision. Summit Strategies. June 2004.

⁵ Bittman and Scott. "Real-Time Enterprise Demands, a Real-Time Infrastructure." Gartner Symposium. October 2004.

⁶ International Technology Group. "BEYOND TCO: Impact of IT Efficiency on Business Costs & Performance." January 2004.