

IBM's Vision For The New Enterprise Data Center

A breakthrough approach for efficient IT service delivery



Table of contents

	3
Introduction	4
Market forces are driving change	6
Transforming to a New Enterprise Data Center model	10
The New Enterprise Data Center: the journey evolves	13
IBM's commitment to evolving IT service delivery	14
How to start on your own journey	14
Conclusion	



Introduction

You can't make the world move slower. Or change where markets are headed. Or hold back new technologies while focusing on day-to-day IT operational issues. But there is something you can do, right now. To react faster. To be more efficient. To provide innovation for your business and your customers. A new vision. A better approach. The new enterprise data center—starts now.

The fact is, not all of today's IT infrastructures were built to support the explosive growth in compute capacity and information. Many data centers have become highly distributed and somewhat fragmented. As a result—they are limited in their ability to change quickly and support the integration of new types of technologies or to easily scale to power the business as needed.

So how do you find the time and resources to drive the innovation required to keep your company competitive in a rapidly changing marketplace? How can you react to business needs faster?

Since today's distributed approach to the enterprise data center is challenged to keep up in a fast-paced business environment, a new centralized IT approach is needed. We must rethink IT service delivery to help move beyond today's operational challenges to a new data center model that is more efficient, service oriented and responsive to business needs. With new economics. Rapid service delivery. And one that can provide tighter alignment with business goals.

IBM's vision for the new enterprise data center is an evolutionary model that helps reset the economics of IT and can dramatically improve operational efficiency. It also can help reduce and control rising costs and improve provisioning speed and data center security and resiliency—at any scale. It will allow you to be highly responsive to any user need. And it aligns technology and business—giving you the freedom and the tools you need to innovate—and stay ahead of the competition.

Through our experience with thousands of client engagements, we have developed an architected approach based on best practices and proven implementation patterns and blueprints. And our own data center transformation provides first-hand proof that embracing this new approach simply makes good business sense.



Market forces are driving change

Right now, technology leaders are challenged to manage sprawling, complex distributed infrastructures and an ever growing tidal wave of data, while remaining highly responsive to business demands. And, they must evaluate and decide when and how to adopt a multitude of innovations that will keep their companies competitive.

Daily operational challenges

IT professionals spend much of the day fixing problems—keeping them from applying time and resources to development activities that could truly drive business innovation. In fact, many say they spend too much time mired down in operations and precious little time helping the business *grow*. These operational issues include:

The bottom line? Enterprises report that IT operational overhead is reaching up to 70 percent of the overall IT budget. And that number is growing—leaving precious few resources for new initiatives.⁵

- **Costs and service delivery:** Time is money—and most IT departments are forced to stretch both. There is no question that the daily expense of managing operations is increasing, as is the cost and availability of skilled labor. In fact, IT system administration costs have grown four fold and power and cooling costs have risen eight fold since 1996 alone.¹ And in today's data center, data volumes and network bandwidth consumed are doubling every 18 months with devices accessing data over networks doubling every 2.5 years.²
- **Business resiliency and security:** As enterprises expand globally, organizations are requiring that IT groups strengthen the security measures they put in place to protect critical information. For good reason. Enterprise risk management is now being integrated into corporate ratings delivered by organizations such as Fitch, Moody's, and Standard & Poor's.³ At the same time, companies are demanding that users have real-time access to this information, putting extra—and often conflicting—pressure on the enterprise to be both secure and resilient in the expanding IT environment.
- **Energy requirements:** As IT grows, enterprises require greater power and cooling capacities. In fact, energy costs related to server sprawl alone may rise from less than 10 percent to 30 percent of IT budgets in the coming years.⁴ These trends are forcing technology organizations to become more energy efficient—to control costs while developing a flexible foundation from which to scale.

“More than 70 percent of the world’s Global 1000 organizations will have to modify their data center facilities significantly during the next five years.”⁹

—Gartner, September 2007

Harnessing new technologies to support the business

If you’re spending most of your time mired in day-to-day operations, it’s difficult to evaluate and leverage new technologies available that could streamline your IT operations and help keep your company competitive and profitable. Yet the rate of technology adoption around us is moving at breakneck speed, and much of it is disrupting the infrastructure status quo. Consider some examples: In 2007, there were 3 billion mobile subscribers worldwide—and that number is estimated to grow by 2010.⁶ Between 2003 and 2006 stock market data volumes rose by 1750 percent in financial services markets alone.⁷ And by 2010, it is estimated medical imaging will consume 30 percent of the world’s data storage.⁸

Increasing speed and availability of network bandwidth is creating new opportunities to integrate services across the web and re-centralize distributed IT resources. Access to trusted information and real-time data and analytics will soon become basic expectations. Driven by the expanding processing power of multi-core and specialty processor-based systems, supercomputing power will be available to the masses. And it will require systems, data, applications and networks that are always available, secure and resilient.

Further, the proliferation of data sources, RFID and mobile devices, unified communications, SOA, Web 2.0 and technologies like mashups and XML create opportunities for new types of business solutions. In fact, the advancements in technology that are driving change can be seen in the new emerging types of data centers, such as Internet and Web 2.0, which are broadening the available options for connecting, securing and managing business processes.

Ultimately, all of these new innovations need to play an important role in the new enterprise data center.



Transforming to a New Enterprise Data Center model

IBM's vision for the new enterprise data center provides for a new approach to IT service delivery. Through it, you can leverage today's best practices and technology to better manage costs, improve operational performance and resiliency and quickly respond to business needs. Its goal is to deliver:

New economics: The new enterprise data center helps you transcend traditional operational issues to achieve new levels of efficiency, flexibility and responsiveness. Through virtualization you can break the lock between your IT resources and business services—freeing you to exploit highly optimized systems and networks to improve efficiency and reduce overall costs.

Rapid service deployment: The ability to deliver quality service is critical to businesses of all sizes. Maintaining a positive customer experience—and ensuring cost efficiency and a fast ROI—relies on your ability see and manage the business—while leveraging automation to drive efficiency and operational agility. Therefore, service management is a key element in the new enterprise data center approach.

Business alignment: A highly efficient and shared infrastructure can allow you to respond instantaneously to new business needs. It creates opportunities to make sound decisions based on information obtained in real time, and it provides the tools you need to free up resources from more traditional operational demands. With a new enterprise data center, you can focus on delivering IT as a set of services aligned to the business—freeing up time to spend on IT driven business innovation.



Enabling The New Enterprise Data Center—a holistic, integrated approach

What makes IBM's approach for efficient IT service delivery so unique? As businesses move toward a recentralization of the data center environment, a holistic integrated approach needs to be considered. IBM captures an end-to-end view of the IT data center and its key components. Although we understand that incremental improvements to each element of the new enterprise data center can improve overall operations, we take into account that modifications to one component may strain the performance of another.

For example, upgrading the enterprise information architecture to provide integrated and trusted information to users will likely require changes to security and business resiliency approaches. And, creating highly virtualized resources are most effective along with a stronger, more integrated service management approach.


As such, the strategy for the new enterprise data center needs to be holistic and integrate the key elements of:

- **Highly virtualized resources** that are flexible to adjust to changing business needs to allow for more responsive provisioning and help deliver efficient resource utilization. Virtualization removes the bind between applications and data and underlying physical resources—granting IT organizations more flexibility and freedom in deployment options and the ability to exploit highly optimized systems.



IBM was named ComputerWorld's No. 1 Green IT Vendor in 2008. According to ComputerWorld, "Green computing promises an enormous win for IT: a chance to save money—and the environment. Many companies are trying to go greener, but a few truly stand out."¹⁰

- **Business-driven service management**, in which a complex and difficult-to-manage environment is transformed for improved transparency—and cost-efficient, easier management. This transformation involves raising management tasks from the simple monitoring of individual resources to the orchestration of the entire environment to be more responsive and efficient. Once transformed, the environment can be fully aligned with business needs and controls to ensure that customer priorities are met, business controls are maintained and availability and performance is maximized *across the entire enterprise*.
- **Security and business resilience** approaches and best practices that become increasingly important with the consolidation of data centers and recentralization of systems and data while providing secure, open access across and beyond organizational boundaries.
- **Efficient, green and optimized infrastructures and facilities**, which balance and adjust the workloads across a virtualized infrastructure and align the power and cooling consumption with business processing requirements across all IT and data center facilities. The result is balanced energy demands to help avoid high peak energy use and the associated higher energy billing rates and meet SLAs based on business priorities. Through the introduction of an optimized infrastructure, the number of systems and networks in the data center can be reduced, cost efficiency improved and energy efficiency enhanced.
- **Enterprise Information Architecture**. Data that was typically contained in disconnected, heterogeneous sources and content silos is virtualized through a flexible enterprise information architecture. Therefore, IT can deliver trusted information to people, processes and applications to truly optimize the business decision making and performance.



Many companies have begun to address some of these challenges head on. In fact, between 30 to 50 percent of large enterprises have consolidated or are consolidating today, and most are doing some level of virtualization.¹¹ Those that have really advanced these efforts are seeing significant returns or savings.

Some of our clients—and IBM's own data center transformation—have shown the ability to:

- Triple asset utilization¹²
- Provision new resources in minutes¹³
- Reduce heat by up to 60 percent¹⁴
- Reduce floor space by as much as 80 percent¹⁵
- Reduce disaster recovery time by 85 percent¹⁶

Is your organization seeing these types of benefits? If not, the possibilities do exist. In fact, today IBM is working with clients who *are* seeing these kinds of improvements. And, their efforts are not only impacting the bottom line—they are freeing up the technology resources and human capital to work on new innovation projects.



The New Enterprise Data Center: the journey evolves

Most likely, many companies have already started to implement a few key components on their way to a new enterprise data center model. Some have projects in place to consolidate and virtualize servers, data silos and storage. Others are exploring new ways to optimize information availability. In reality, though, few data centers today begin with a clean slate.


To truly maximize the benefits of this new model, you must start planning your transformation—or journey—and that begins with consideration for where you and your priorities are today. You don't build a house without a blueprint. Why would it be any different with your IT infrastructure?

IBM has identified three stages of adoption along this journey: Simplified, Shared and Dynamic. Each offers a range of benefits that can be achieved as you progress along the continuum toward deploying a new enterprise data center.

Simplified: This stage involves consolidating data centers and the physical infrastructure, such as storage, servers, networks and information. By breaking down silos of similar resources and deploying end-to-end systems and network tools, organizations begin to simplify the management of the data center, which becomes more resilient and secure. Service management takes on an increasing important role in automating the newly integrated IT and business services. Most enterprises begin their journey here.

Scaling back—an IT service transformation program

By consolidating, optimizing and virtualizing its servers and storage, the University of Pittsburgh Medical Center reduced its physical systems inventory by up to 60 percent. Plus, it consolidated 40 storage subsystems down to two storage area networks (SANS). Because it reduced energy, complexity and labor, the organization has been able to trim costs by nearly \$40 million.



Shared: This stage is about creating a shared IT infrastructure that can scale rapidly and efficiently without being limited by facilities or energy. Here, organizations can begin to gain increased efficiency and flexibility by creating highly virtualized resource pools for server platforms, storage systems, networks, information and applications. This provides efficiencies of scale, because each pool is managed as a single resource. With large pooled resources, utilization can rise, energy efficiency can improve, service delivery is more flexible and the entire environment can be better aligned with the business.

In addition, this shared environment allows for quick and easy provisioning of new IT resources on an as needed basis, regardless if you're responding to seasonal growth in sales or the launch of a new application or business service. This dramatic increase in flexibility and responsiveness is enabled by policy-based service management, which allows these pooled assets to be easily provisioned and cohesively managed through a service catalog.

Finally, a shared infrastructure permits movement, control and balance of workload and data. Energy management tools, which can tie into data center power and cooling systems, help further improve energy efficiency. Hence, your data center becomes "green by design"—not just in how it uses power—but in the ability to greatly increase capacity and scale to any level, as required.

Expanding performance

By leveraging IBM storage virtualization technology, Hong Kong Broadband Network was able to pool resources across IBM and non-IBM storage servers. In doing so, the organization created faster testing environments and achieved far better utilization and greater flexibility. And, it drove performance improvements over 50 percent.



Dynamic: At this stage, you can achieve true flexibility and freedom. You've removed the physical tie between services delivered and the underlying infrastructure, and you now can bring new services online rapidly, without concern over where they are going to execute. For example, a user can simply request a new service—and a level of service quality—without understanding how it is built and delivered. Essentially, the complexities of the underlying IT infrastructure are now 'hidden' as well as automated and optimized. And given that IT services are offered in terms of service levels, rather than specific technologies, you have the ability to modify resources to be as cost effective as possible without disrupting business. Plus, you gain efficiency through standardization and the automation of policies and processes through service management.

IBM puts IT tools in the hands of its researchers

To support its research team, the IBM IT group developed a Research Compute Cloud (RCC), to reduce the time and management overhead required to support ever-changing IT service needs. As a highly virtualized shared infrastructure with automated service management, the RCC provides researchers the ability to obtain common application services, such as a new database, in minutes instead of days or weeks. Through this new venture the IBM IT staff has improved the research team's productivity—and satisfaction with IT.

“For IT executives looking for a single, one-stop shop for assistance in building next-generation data centers—and for a company with a long-term, comprehensive industry vision complemented by associated products and services—IBM should be first-and-foremost on any new enterprise data center migration short-list.”¹⁷

—Clabby Analytics, Jan 2008

IBM's commitment to evolving IT service delivery

IBM offers an approach that is built on real-world experience, embraces open standards and is supported by an ecosystem of technology partners.

IBM continues to invest in open communities to speed the process and acceptance of new types of technologies. Our commitment is based on real-world experience and a proven track record of taming disruptive innovations such as using the internet for e-business, leveraging open source to produce enterprise Linux, and now harnessing the efficiencies of cloud computing for the new enterprise data center.

Our focus is as much on process as it is technology transformation. With thousands of highly successful customer transformation engagements over the last few years, we've been able to identify best practices for IT optimization and transformation. Our vast experience has enabled us to develop a proven and disciplined strategy, design and implementation approach incorporating consolidation, virtualization, flexible IT infrastructure and 'IT as a set of services' patterns to simplify your transformation, regardless of your starting point. And as our experience grows, we continually enhance the blueprints that are needed to move to a truly efficient, dynamic service delivery environment.

Our experience is at all levels—from technology, consulting and strategy services through business processes—to collaborate with our clients and help them gain value at every stage.

IBM's own data center transformation

IBM has been on this journey toward a new enterprise data center for years. We began in the simplified stage, and through various levels of consolidation and centralization, we have seen tremendous benefits, including savings up to \$1.5 billion reduction in operational costs per year. We marched right into the shared phase with “Project Big Green,” which is projected to double our computing capacity by 2010 without increasing power consumption or impact. And as we move toward a fully dynamic IT model, we anticipate continued improvements of service delivery, real-time integration of data analytics and information and the true delivery of IT as a business service.



How to start on your own journey

Transformation to a new enterprise data center is an evolutionary one. Therefore, getting started requires you to identify your starting point on the continuum—aligning immediate needs with your long-term vision. For example, some organizations may have critical operational issues that need to be addressed today. Others may be improving availability and security within the infrastructure. With years of proven experience and our established reference architecture, IBM helps you define your starting point, address immediate needs and develop a detailed roadmap that offers rewards at every milestone along the way.

Conclusion

Organizations in every industry are exploiting advanced technologies to gain competitive advantage. And, infrastructure complexity and rising energy costs are driving higher operational expenses for organizations. IBM's vision for the new enterprise data center offers an evolutionary new model for efficient IT delivery—giving you the tools to overcome the minutia of daily operations to drive real business innovation. And, IBM can provide the roadmap, tools and support to help you get there.





For more information

To find out how IBM can help you transform your data center, contact your IBM representative or visit:

ibm.com/datacenter

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Route 100
Somers, NY 10589
U.S.A.

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3-08
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