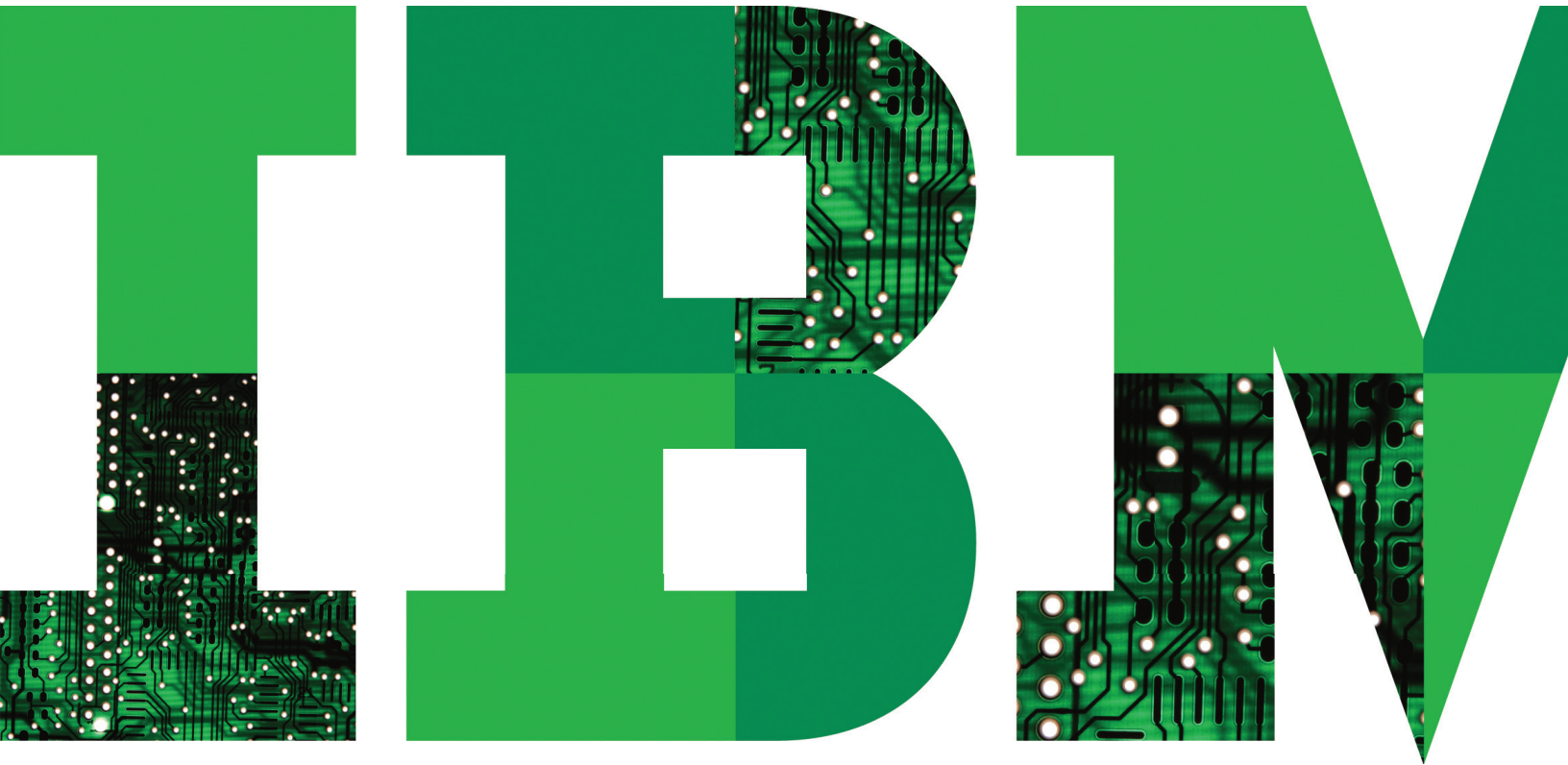


# Meeting Canada's need to support business growth with new data centre capacity

*How IBM is helping Canadian organizations manage risk, reduce costs and deliver business value*



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## Introduction

As IT continues to take on growing importance in the enterprise, CEOs are increasingly turning to their CIOs to help them implement innovative solutions to seize the opportunities presented by change. In the 2012 IBM Global Chief Executive Officer Study,<sup>1</sup> CEOs cited technology as the most important external force they face, significantly impacting their approach to building economic value. In fact, CEOs at the top-performing companies indicated 68 percent greater focus on combining technology with the business to drive innovation and growth.

Leading CEOs are revamping their operations to be ready to act when opportunities or challenges arise. Flexible cost structures and partnering capabilities allow them to rapidly scale up or down. To step up to this opportunity, CIOs will need to turn their organizations' IT infrastructures into more agile and automated environments that can support change while managing the associated risks. And they'll need to do so while under continuing pressure to do more—faster and better—with less.

In reality, many Canadian enterprises are currently struggling to support this growth. Various studies indicate that almost 50 percent of enterprises report that providing sufficient data centre space and ensuring the availability required to meet service demands are among their top challenges. What's more, 50 percent of the respondents in a recent Canadian survey said that they had suffered server or system downtime, and 37 percent reported site outages—all in the wake of power and cooling issues.<sup>2</sup>

To help deliver value, over 50 percent of CEOs are now partnering with outside organizations.<sup>3</sup> IBM is especially well positioned to help meet those growing demands in Canada, having invested significantly in new, resilient raised floor capacity to meet client needs.

Our most recent flagship investment is a new data centre located in Barrie, Ontario, just under 100 kilometers from Toronto—and 65 kilometers from the greater Toronto area, where our Markham data centre is located. The new IBM Canada Leadership Data Centre leverages global best practices developed in designing, building and operating data centres around the world. It offers Canadian organizations more options for gaining flexible, comprehensive access to the IT operations they need with the resiliency, cost efficiencies and services that are vital to helping them compete in fast-changing times.

## Managing risk across multiple demands

Availability is critical to the success of today's enterprise. Unplanned downtime can be catastrophic to a business, potentially leading to lost revenue, a damaged reputation and a compromised competitive position.

### The right place at the right time

Employing the same methodology that we advise our clients to use, we evaluated a number of site selection characteristics for the new facility—paying special attention to providing the capacity and resiliency needed in the market, including:

- **Synergies**—that include proximity to an IBM strategic IT delivery data centre and to key client or partner locations
- **Environmental advantages**—that provide a suitable climate, with a high number of “free” cooling days
- **Cost considerations**—that take into account both the initial construction costs and ongoing operating and maintenance costs, including power and taxes
- **Infrastructure availability**—including access to redundant power, network, water supplies, permitting and zoning flexibility, and airport proximity.
- **Minimal risks**—including geographic, political and economic risks.

Proximity to other IBM and client data centre locations, along with the network and power availability considerations, were given additional weighting to meet the market demands.

## Close enough, but far enough

Many large and medium-sized organizations in Canada are implementing a two-data-centre strategy, which allows them to locate their primary IT operations in one data centre and establish a backup centre somewhere else. So if the primary facility goes down, there's a backup location ready to take over.

We selected Barrie because it was “close enough, but far enough” to the greater Toronto area. Barrie is close enough (in terms of network distance) to allow efficient data synchronization and far enough away (typically 50 kilometers or more) to offer “geographic diversity”—meaning that a natural disaster would be unlikely to strike both locations simultaneously. It's a strategy that allows companies located in the greater Toronto area to establish a nearby data recovery centre that's not exposed to the same disruption as their primary facility might be.

At the same time, we needed to be close enough to Toronto to be within reasonable commuting distance from that city for a company's employees, who might need to redeploy to a recovery centre in the event of a disaster.



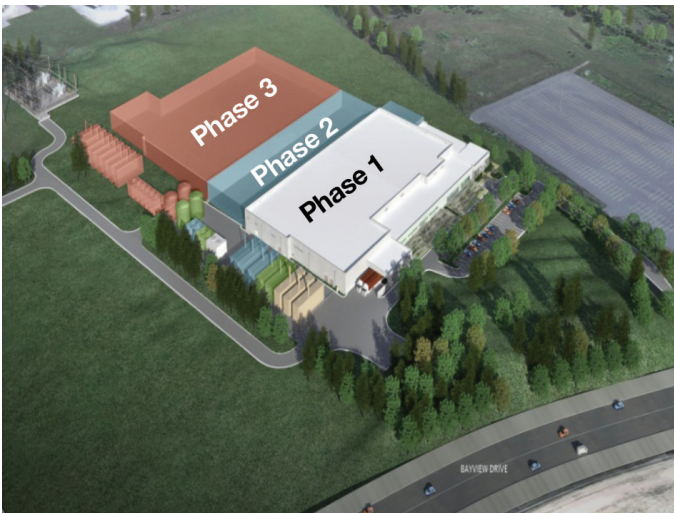
*Figure 1.* The IBM Canada Leadership Data Centre location supports synchronous data replication for mission critical applications within a 100-kilometer network radius of its location in Barrie, Ontario. The location also meets guidelines for the minimum geographic distance between primary and secondary data centre locations, while improving availability via synchronous disk replication.

What's more, the Barrie site will serve as a secondary/recovery centre for enterprises in the greater Toronto area, where there are two additional IBM data centres—located in northern Toronto and in Markham. It's a solution that can reduce complexity for companies, by allowing them to work with a single provider across multiple data centre facilities.

### Staying in sync with client needs

As information continues to become a powerful world currency, protecting and accessing information assets is more critical than ever. For companies located within a 100-kilometer network distance from Barrie, IBM is currently the only outsourcing provider offering an outside-of-Toronto facility within a short enough distance to allow for synchronous application replication. This high level of performance is especially important to government, financial and retail organizations, where transactional accuracy is a critical issue at all times. These enterprises need the resiliency to ensure that valuable data and systems are available continuously. By taking advantage of synchronous data replication to the data centre, companies can protect revenue by avoiding downtime, reducing capital requirements and improving the availability of mission critical systems.

There's also the added advantage of reduced recovery time—from hours to minutes—that's the result of eliminating tape transport and loading time. In doing so, it's possible to lower tape and media costs by as much as 50 percent and reduce capital expenditures through subscription-based services that permit companies to “rent” recovery centre capabilities instead of “building” them.



*Figure 2.* Opened in September 2012, the IBM Canada Leadership Data Centre offers 25,000 square feet of raised floor space today, with the capability to scale to 100,000 square feet. Currently capable of providing 1.5 megawatts of power to the IT load, it's engineered to grow to 15 megawatts without interruption to the IT operation. In addition, its power usage effectiveness (PUE) is calculated at 1.29 at full load and it's designed to achieve the LEED Gold Certification Objective.

### Highly available backups

Meeting audit and regulatory guidelines for creation and retention of backups is key to any organization's overall data recovery strategy, because no company can recover from a disaster without being able to recover its data.

The Barrie facility takes full advantage of IBM's decades of experience in managed backup services. In fact, each month we currently manage the backup of some 43,000 terabytes of data worldwide, via 2.5 million backup operations.

Our backup solutions help companies mitigate risk by offering remote access to a cloud-based data vault for data storage and recovery. And with "pay-only-for-what-you-use" utility pricing, clients avoid the capital expenditure that would come with investing in their own backup and recovery systems, making those resources available for more immediate business needs.

### Perspective: How we decided to proceed

We face the same concerns our clients face: How much capacity do we need now and how much will we need in the future? We couldn't justify building a 100,000-square-foot data centre now, so we could "grow into it" later. That would be a huge waste of capital and operating resources. So we decided on an approach that reflects growth rates for data centre capacity in Canada and then added in the increase in demand that we were seeing for our outsourcing and business continuity services. In addition, we took into consideration the recently completed strategic data centre in close-by Markham, with another 24,000 square feet of space. That led us to build out 25,000 square feet of raised floor white space —5,000 of which is dedicated to hosting our business continuity and resiliency services. When we reach 60 percent capacity in the space we have now—or when we see significant new demand on the horizon—we'll be able to build out additional raised floor space without disrupting the current operations. IBM's years of in-house experience and deep expertise made it possible to project what our needs would be and plan proactively. It's the same kind of insight and advice we offer clients in a similar situation.

## Aligning data centre capacity to demand reduces the cost of ownership

Because demands for IT capacity are unrelenting and often difficult to predict, we needed to take a new approach to designing a data centre that would effectively meet future needs. It no longer makes sense to design a large, capital-intensive data centre to last 20 to 30 years when the technology it supports changes every two or three years.

The Canadian leadership data centre uses the same innovative modular design approach that became standard within IBM after the 2010 opening of IBM's leadership data centre in Raleigh, North Carolina. It's built in smaller increments—or modules—allowing it to fuel business growth while adapting to IT changes in a way that permits upgrades without disrupting operations. At the same time, it provides the flexibility to match short-term capacity requirements with long-term growth in a cost-effective manner.

Closely matching capital and operating costs to changing business needs helps provide an unusually high level of fiscal precision in data centre planning. Instead of building a 100,000-square-foot facility at the outset, we used our scalable enterprise modular data centre design approach, which allows us to provision the space and infrastructure equipment only as it's needed.

Designing to optimize around the total space in the data centre is no longer appropriate when the cost of the physical “shell” only makes up 10 percent of the total capital costs. By contrast, up to 60 percent of the capital costs to build a new data centre and 50 percent of the operational costs are energy related. In building the full shell and adding raised floor capacity only as we need it, we can reduce both our capital and operating expenses by as much as 40 to 50 percent. (See figure 3.)

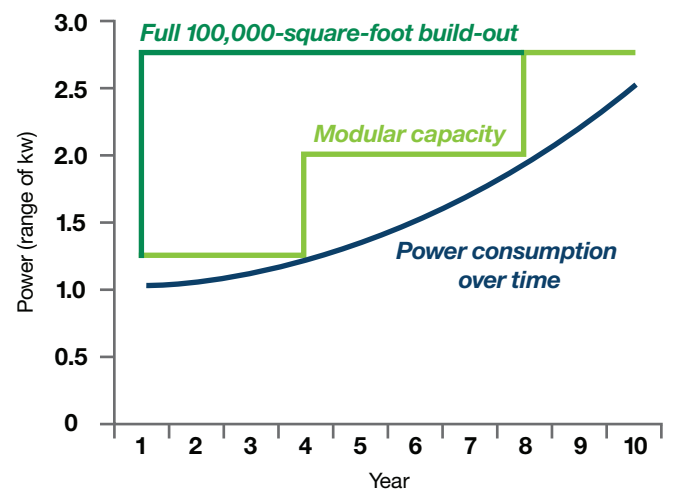


Figure 3. By taking a modular approach to building the IBM Canada Leadership Data Centre we can better align the costs to capacity needs.

### Meeting business objectives—for flexibility and availability

As the demand for IT continues to grow, it puts increasing pressure on the data centre to supply the power and cooling necessary to run business applications and provide high levels of availability. Because we've seen the power density of x86 servers increase by a factor of 20,<sup>4</sup> the data centre needed to be flexible to support higher density servers and virtualized environments.

IBM anticipated the need for flexibility—as it has in prior leadership data centres—by:

- Offering **up to 32 kilowatts of power per rack—which is more than six times the industry average**—to meet the growing density needed to support virtualized environments and implement cloud technologies (even higher densities could be supported on a contained number of racks)
- Designing and building the main infrastructure to accept **up to 15 megawatts of power**, eliminating the need to shut down for upgrades to increase capacity, thus maintaining true 24x7 operation.

We're able to accomplish this by sizing our mechanical and electrical capacities for future needs, without being forced to install or turn it all on until we need it. Investing the extra 5 to 10 percent necessary now to make that possible is “insurance” designed to protect us from needing to disrupt our operations

and upgrade those systems later—at a cost of up to 60 percent more. It allows us to reduce our exposure to operational disruptions when we need to add more capacity, making the growth process easier and more cost-effective in the long term.

Similarly, we provisioned for floor-based water cooling to support the high-density servers likely to become even more prevalent in the future. Taken together, horizontal and vertical scalability help provide a flexible and cost-effective way to support new technology adoption.

### Energy efficiency—the new operational metric

Designing and operating a data centre to be energy-wise is part of a long standing commitment at IBM. While data centres occupy only 6 percent of our facilities' real estate worldwide, they account for 45 percent of our company's total energy consumption. By leveraging the global best practices established in operating over 430 data centres, we were able to double our IT capacity for our strategic outsourcing clients—without increasing energy consumption—over a three year period. Those best practices helped guide the design of this facility, as well.

We've also invested in energy efficient mechanical equipment, including motors, variable frequency pumps and chillers, that will deliver a return on investment in three years or less. And by locating this centre in a favorable climate zone, we'll gain an estimated 209 days of full “free” cooling annually, and 126 days of partial free cooling.

Being energy-wise means balancing upfront capital costs with the 20-year operational costs. For example, when choosing between air side cooling and water side cooling, it might intuitively seem that the former would be less expensive—and therefore more energy efficient. But although water side cooling incurs a higher energy cost, the overall cost for air cooling (including both the cost of energy and the associated operating costs) is actually higher.

In addition, we've been able to reap further savings by changing the way we manage our data centres, successfully raising the temperature at which we cool that water—from 48 degrees in a data centre built just four years ago, to 55 degrees at the IBM Canada Leadership Data Centre.

Taking measures like these has allowed us to reduce this data centre's energy costs by as much as 60 percent, in comparison to those of a traditional data centre.

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#### **The four characteristics of highly efficient data centres**

The 2012 IBM Global Data Centre Study surveyed 308 IT executives in seven countries in an effort to understand the current state of their data centre operational efficiency — processes, tools, and technologies — across eight separate areas: data centre operations, facilities management, servers, storage, network, applications and tools, governance and staffing. An analysis of the responses to the survey's 65 questions uncovered a set of characteristics that differentiated the most efficient companies from the others, based on the ways in which they operate their IT and facilities environments. They all make it a point to:

- **Have a plan that aligns with business goals and keep it current**
- **Design for flexibility to support changing business needs**
- **Optimize the IT and facilities assets to maximize capacity and availability**
- **Use automation tools to improve service levels and availability**

The IBM Canada Leadership Data Centre shares all of these characteristics.

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#### **Reinventing the strategic services relationship**

For decades, cost savings was the dominant driver behind outsourcing. But this traditional model of outsourcing—architected primarily to reduce costs—is too narrow to accommodate the outsized expectations of today's business innovators. More than half of CEOs now partner extensively with external providers to drive innovation. Among outperforming organizations, that percentage is even higher (59 percent).<sup>5</sup> In business today, most products and services are designed, developed and delivered by an integrated—and often global—network of partners. This shift in mindset—from outsourcing non-core functions to sourcing critical capabilities—is changing the fundamental underpinnings of the services industry.



As a global leader in the provisioning of strategic business and IT services, IBM offers an approach that is focused on automating processes, leveraging business analytics and driving optimization to enable smarter enterprises. Our disciplined approach utilizes a combination of tools, technology and innovation. The result: a smarter computing platform fueled by insight, designed for innovation and growth, and proven to deliver measured business outcomes and exceptional value for our clients.

IBM's focus on providing business value is grounded in collaboration—not only as we see it, but as our clients define it. Our service management practices integrate with our clients' existing processes, systems and organizations to improve the efficiency of IT operations while increasing the effectiveness of the business services delivered and managed by IT. Our service delivery system comprises four key elements:

- **Skills**—We offer broad and deep skills-based resource pools, in addition to specialized talent.
- **Processes**—Based upon years of experience around the world, our processes are efficient, effective, mature and driven by continuous improvement.
- **Assets and tools**—Our tools are developed and refined to reflect our own best practices, and automated and applied across the board.
- **Information analytics**—We help you detect and define trends through high levels of visibility, service level agreements, key performance indicators and defect prevention across platforms.

IBM owns and manages over 430 data centres, comprising more than 8.3 million square feet of space around the world. And the people working in those data centres—including the IBM Canada Leadership Data Centre—are trained to meet the needs of our clients and their businesses by delivering the same levels of service excellence in the same way.

### Quality is a continuous process

Clients expect a high level of quality from their strategic services provider. IBM has made significant investments since 2006 in disciplined process methodologies, standardization, and integrated tools and analytics. We not only solve problems and perform changes, but we continuously improve quality through powerful innovations such as our defect prevention process and the sharing of best practices globally from our many clients. And our client-focused management system helps encourage collaboration and teaming with our clients.

But quality service delivery in a data centre setting also means increasing availability—by reducing outages and errors across the board. So we take steps to ensure that a culture of improving quality is built into every service we offer.

### Industry and technology expertise provides value built over decades

Our industry and technology expertise allows us to take advantage of the insights we've garnered from thousands of clients to help solve problems on behalf of thousands more, while bringing innovation to our delivery model. We start virtually every client relationship with an end-to-end analysis of their business. And we use the results to develop a solution that's shaped around their specific needs, applying industry best practices to their business requirements.

### **Adaptability and flexibility help us meet changing business needs**

All businesses will change over time. That's why our delivery model is built to respond by sourcing the right skill at the right time from around the globe. In addition, our processes are designed to adapt when circumstances change. For example, we can move resources to where they're needed most because our pooling capability includes "swing" rules that make it possible. Likewise, we offer a range of consumption, delivery, and pricing models designed to adapt to our clients' specific needs.

### **Risk management helps ensure stability, security and compliance**

Our clients trust us to protect some of their most valuable assets. So our "secure by design" philosophy ensures that security is baked into our IBM business processes, our product development and daily operations. Our elite X-FORCE™ research and development team maintains one of the world's most comprehensive security databases. And our rigorous security and compliance offerings, along with our business continuity plans, are designed to help maintain service continuity should a disruption occur.

### **Financial value delivers benefits across skills, architecture and performance**

Clients choose sourcing initiatives for a variety of reasons that address both operational pressures and longer-term strategic objectives. The potential annual cost savings of business and IT services sourcing can be significant and provides an

opportunity for our clients to create a self-funding model for the development of new IT initiatives. IBM can help companies create a smarter IT infrastructure that drives more innovation back into their businesses, contributing to top-line growth and bottom-line savings.

### **Taking the next step together**

The IBM Canada Leadership Data Centre showcases the ways in which we take advantage of our global experience to help solve local problems. It's the product of a detailed strategy to manage risk, optimize the total cost of ownership and provide service excellence.

You can leverage the IBM Canada Leadership Data Centre to help your organization:

- Eliminate the capital and operating costs associated with building a data centre of your own, by teaming with IBM for service delivery
- Share infrastructure and IT costs by taking advantage of a multi-user facility
- Simplify IT operations
- Accelerate the deployment of revenue-generating applications
- Reduce risk on mission critical business functions.

And if your strategy calls for building your own data centre, the IBM Canada Leadership Data Centre can serve as a model for a scalable, energy-efficient design, based on global best practices.

## Why IBM?

Today's leading CEOs are embracing change. They see that change brings opportunity: the opportunity to differentiate their business to meet the demands of informed and socially aware customers; and the opportunity to adapt their business models to take advantage of stronger collaboration, partnering and global integration. Moreover, change offers them an opportunity to try new ways to rapidly and cost-effectively grow their business.

By changing our approach to data centre design, construction and operations, we've developed new ways to manage capacity growth to better match business growth, and to adopt new technology. Building information technology and owning or managing more than 8 million square feet globally provides us with extraordinary insight across the data centre—from manufacturing and operation to designing and creating data centres that support existing and new information technologies to come.

When you collaborate with IBM, you position yourself to take advantage of our expertise, insight and innovation to help drive transformative value for your organization.

## For more information

To learn more about the Canada Leadership Data Centre, please contact your IBM representative or visit the following website:

[www.ibm.com/smarterdatacentre/ca](http://www.ibm.com/smarterdatacentre/ca)



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Route 100  
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U.S.A.

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September 2012  
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<sup>1</sup> “Leading through connections: Insights from the Global Chief Executive Officer Study,” IBM Institute for Business Value, May 2012. This research is based on in-depth interviews of more than 1,700 CEOs from around the world.

<sup>2</sup> IDC Canadian Data Centre Overview for IBM, July 2012, Mark Schrutt, Director, Services & Enterprise Applications, and David Senf, Vice-President, Infrastructure Solutions Group, IDC Canada

<sup>3</sup> “Leading through connections: Insights from the Global Chief Executive Officer Study,” IBM Institute for Business Value, May 2012.

<sup>4</sup> Best Practices for Datacom Facility Energy Efficiency Second Ed. (c) 2009, Page 4, Figure 1.3.

<sup>5</sup> “Leading through connections: Insights from the Global Chief Executive Officer Study,” IBM Institute for Business Value, May 2012.



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