



IS YOUR INFRASTRUCTURE HOLDING YOU BACK?

*Get the facts to make the most-informed
investment decisions*

EBOOK



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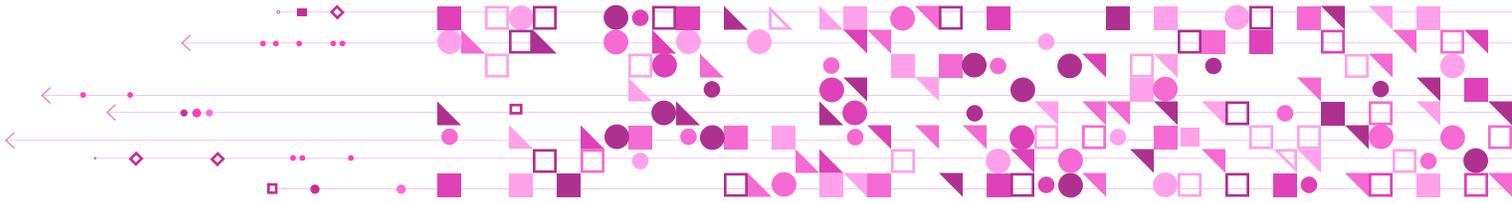
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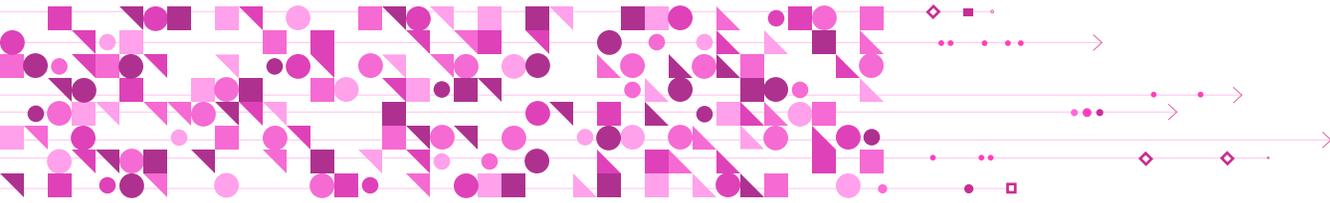
DO YOUR BUSINESS LEADERS KNOW WHAT'S AT STAKE?

Fewer than 10 percent of companies say they are fully prepared for new trends such as cloud, mobile, social, and big data and analytics.¹



Business leaders are looking for ways they can take advantage of what's new and hot in the marketplace to get ahead. Right now that's mobile, social, big data and analytics trends, fueled by cloud technology. But very few organizations are actually prepared to do so—fewer than 10 percent, in fact.² Turns out, not having the right infrastructure in place is a big reason why. But a lot of business leaders may not realize it.





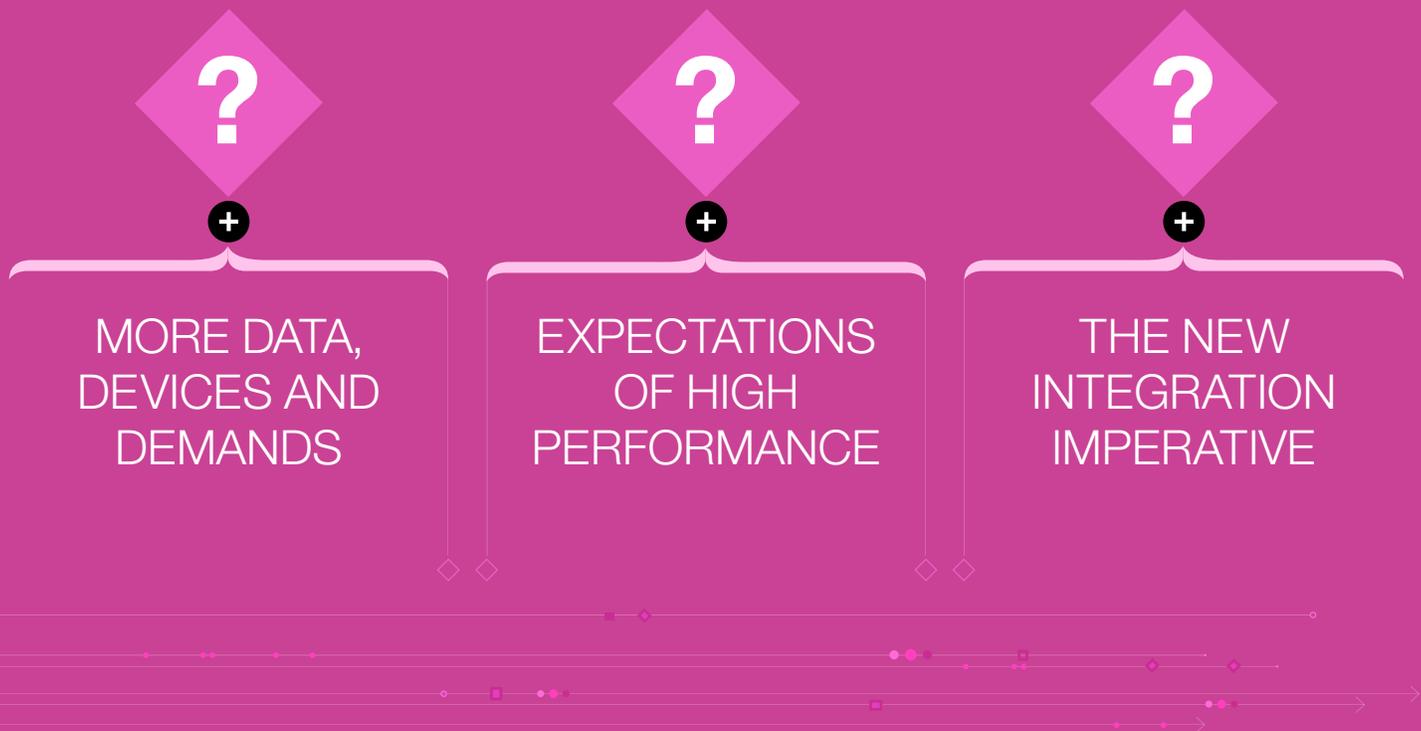
As a cloud expert, it's up to you to help leaders in your organization understand how key infrastructure investments can improve your company's ability to address critical business issues.

This ebook will help you connect the dots between today's biggest business opportunities and the specific technology required to seize them. You'll get the facts you need to identify where current components may be falling short—and how the right investments in infrastructure can lead to better business outcomes while strengthening your role as a strategic consultant within your organization.



WHAT'S PUTTING AN END TO BUSINESS AS USUAL?

Connecting these new business realities to new business and technology demands:



In the last few years, mobile, social, big data and analytics have fueled tremendous shifts in how companies work, what customers expect and how systems should be connecting. **Explore these sections** to understand how these new realities are changing business as usual for your organization and creating new opportunities and challenges that affect your infrastructure needs.



MORE DATA, DEVICES AND DEMANDS

Right now, the digital universe is expanding by 40 percent every year.³ This is fueled by the countless posts, emails, blogs, tweets and other online actions of people and organizations worldwide as well as the vast amounts of data being created by a growing array of connected devices such as smartphones, smart cars, household appliances and equipment on the factory floor. This year alone, the number of active wireless connected devices will exceed 16 billion, which represents a 20 percent increase over 2013.⁴ What's the effect of all those devices — and the data they create — on your business?

NEW CHALLENGES AND OPPORTUNITIES



You need the right cloud infrastructure in place to not only keep pace with all this growth but also capitalize on it. Think about what it will take, and how it will affect your budget, to efficiently and securely support all those new connections inside and outside your organization.

How is business as usual changing?

MORE DATA, DEVICES AND DEMANDS **+**

EXPECTATIONS OF HIGH PERFORMANCE **+**

THE NEW INTEGRATION IMPERATIVE **+**

MORE DATA, DEVICES AND DEMANDS

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NEW CHALLENGES AND OPPORTUNITIES

CLOSE X



How would you scale to support 40 percent more connections a year?

How can you use those connections to improve interactions with customers and support more collaboration among employees and business units in your organization?

What about storage? What will it take to handle all that additional data?

And how can you manage data in a way that makes sure the right people have access to the right information when and where they need it?

How is business as usual changing?

MORE DATA, DEVICES AND DEMANDS +

EXPECTATIONS OF HIGH PERFORMANCE +

THE NEW INTEGRATION IMPERATIVE +

EXPECTATIONS OF HIGH PERFORMANCE

You know that your internal and external customers have high expectations when it comes to getting the information and insights they want — whenever, wherever and on whatever device they prefer. Slow response times, network timeouts, pages not revealing, transactions being lost — these are issues that can cause you to lose customers and business nowadays. As an IT leader, how will you make sure your systems can consistently deliver the performance, availability and reliability needed to satisfy your customers and meet service level agreements (SLAs)?

NEW CHALLENGES AND OPPORTUNITIES



+ **QUESTIONS TO ASK**

You need the right cloud infrastructure in place to constantly deliver on these new demands without adding cost. Consider what happens if you can't scale to meet demand spikes.

How is business as usual changing?

MORE DATA, **+**
DEVICES AND
DEMANDS

EXPECTATIONS **+**
OF HIGH
PERFORMANCE

THE NEW **+**
INTEGRATION
IMPERATIVE



EXPECTATIONS OF HIGH PERFORMANCE

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NEW CHALLENGES AND OPPORTUNITIES

CLOSE X



QUESTIONS TO ASK

Can you ensure an optimal user experience in the cloud?

What happens when you have a network, application or hardware failure in the middle of a transaction? How do you recover from that?

Think about the capabilities you'll need in place to deliver better insights faster. What does that mean for your storage choices?

What will it take to handle mass volumes of structured and unstructured data from various sources while making sure the right people have immediate access to the right data?

How is business as usual changing?

MORE DATA, DEVICES AND DEMANDS **+**

EXPECTATIONS OF HIGH PERFORMANCE **+**

THE NEW INTEGRATION IMPERATIVE **+**



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THE NEW INTEGRATION IMPERATIVE

Taking advantage of new opportunities in mobile, social and other technologies means you will have to connect your systems and applications in new ways, including across hybrid cloud environments. Open technologies give you the flexibility to deploy your services across a wider range of platforms, allowing you to more easily connect your existing systems with new systems that expand your reach to customers. How can you position your company to capitalize on new and emerging opportunities while getting the most value from the infrastructure investments you've already made?

NEW CHALLENGES AND OPPORTUNITIES



+ **QUESTIONS TO ASK**

You don't need to rip and replace existing systems to take advantage of new opportunities. Instead, you need the ability to connect your systems to cloud-based services and technologies that will help you expand your business capabilities and opportunities.

How is business as usual changing?

MORE DATA, **+**
DEVICES AND
DEMANDS

EXPECTATIONS **+**
OF HIGH
PERFORMANCE

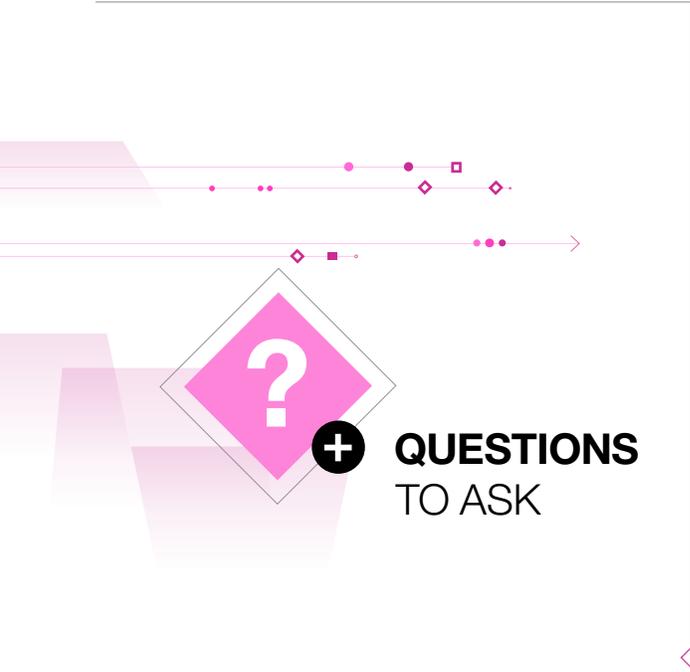
THE NEW **+**
INTEGRATION
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NEW CHALLENGES AND OPPORTUNITIES

CLOSE X



Think about how a more open, virtual infrastructure would expand your customer engagement options. Much of your valuable customer data sits in your data center. Do you have the ability to connect these databases and transaction systems to newer cloud services right now?

How would systems built to integrate with external business intelligence and analytics software improve your ability to support marketing, human resources and other lines of business?

How would a more open and flexible infrastructure affect your future costs and IT staffing needs?

How is business as usual changing?

MORE DATA, DEVICES AND DEMANDS +

EXPECTATIONS OF HIGH PERFORMANCE +

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WHAT'S THE FALLOUT FOR YOUR INFRASTRUCTURE?

Which technology investments should you be focused on, and why?

When you understand the opportunities and challenges of these new business realities, you can more precisely determine the infrastructure technology you'll need to address them.

Although every organization's needs are somewhat different, there are five key areas that you might consider:

1	Optimize storage	+
2	Improve scalability and performance	+
3	Enhance availability	+
4	Rethink security	+
5	Enable open integration	+

Take a look at these sections to find out why each is relevant to the challenges and opportunities your business leaders are focused on and the best practices that you should keep in mind.



1

Optimize storage

Dealing with unpredictable qualities of data is one of the biggest challenges you have as an IT leader. With the amount of data significantly increasing every year and becoming more complex in terms of type, origin and speed, you need storage systems that can help you keep pace. Storage that doesn't slow applications down and make it harder for people to get the data they need when and where they need it. Keys to meeting these goals are aligning storage performance with data value and creating an environment that enables consistently high performance without manual tuning.

Here are a few best practices to keep in mind:

- Storage systems with embedded analytics features that will automatically move aging or less critical data into a lower cost storage tier
- Storage solutions that can easily take advantage of flash technology
- Systems that offer enterprise-class features such as:
 - Nondisruptive data migration between pools, tiers, and old or new hardware
 - Thin provisioning for efficient capacity management and easy growth
 - Storage virtualization to eliminate product silos and increase utilization
 - Self-healing, self-tuning with simple, low-touch management
 - "Five nines" availability and multisite replication to deliver extreme resiliency and data protection



SUCCESS STORY

How did City of Hope meet new-era healthcare demands with cloud?



CLOSE X

CLOSE X

City of Hope National Medical Center

(City of Hope), a leading research and treatment center, needed to provide medical staff with anywhere, anytime access to data and information to support research and growing patient needs on a reduced budget. The center implemented a private cloud to speed system performance, which supports rapid medical intervention and ongoing data growth while freeing up costs for research and treatment.



“The data we collect from our patients grows by around 67 percent every year. Going from managing 1 TB of data to 1.67 TB requires preparation and innovation when on a strict budget. Physicians and nurses might need extremely rapid access to specific patients’ data even on the go, and if we fail to enable this, we are potentially putting lives at risk.”

— TAHIR ALI, DIRECTOR OF ENTERPRISE TECHNOLOGIES, CITY OF HOPE



SUCCESS STORY

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Storage

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solutions that can easily take advantage of new storage technology

that offer enterprise-class features such as: non-disruptive data migration between pools, multi-tiered storage, and old or new hardware

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CLOSE X



THE AVERAGE FIRM USES LESS THAN 50 PERCENT OF ITS STORAGE CAPACITY.⁵

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SUCCESS STORY

How do you manage the massive data demands with cloud? Hope no one else has the same era healthcare demands with cloud?



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- "Five nines" availability and multisite replication to deliver extreme resiliency and data protection



2

Improve scalability and performance

As an IT leader, you need the ability to provide your customers with a consistent, high-quality experience. No matter what. So being able to scale in and out instantaneously is critical, especially when it comes to keeping up with unexpected fluctuations in demand—those “spikey” workloads that can catch your business off guard. Scalability with elasticity can mean the difference between responding in seconds versus minutes—a huge factor when it comes to meeting customer expectations. Keep in mind that applications running on a public cloud may at times perform poorly if they require more resources than expected.

Here are a few best practices to keep in mind:

- ◆ Technology that provides near-linear scalability and scalable resource management, enabling dynamic and automatic scaling based on triggers such as schedules, CPU utilization and bandwidth usage, so your cloud environment will run at optimum levels
- ◆ Servers and storage that operate at near-full capacity so you can scale within your existing footprint, whether we're talking about your private cloud, a public cloud or both
- ◆ Cloud infrastructure offering choice across virtualized and dedicated servers
- ◆ Solutions that let you scale or move between virtualized and bare metal servers as your resource needs change, such as an automated system that adapts images on the fly so you can deploy it on practically any platform or system you choose to facilitate simple, seamless migration between physical and virtual environments



SUCCESS STORY

How did Oxford Networks extend its business focus with cloud?



CLOSE X

Availability Elasticity

Oxford Networks recently extended its focus beyond telephone and fiber optic network services to include managed IT services for business customers. By providing infrastructure as a service (IaaS) to its customers, Oxford has been able to grow its managed services business from a startup to a sustainable business.



“We had to develop an overarching plan for launching our managed service provider (MSP) business, and that meant deploying a reliable, scalable and flexible cloud environment in our data center, including hardware, software and services.”

— ALAN MARBLESTONE, DIRECTOR OF PRODUCT MANAGEMENT, OXFORD NETWORKS

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SUCCESS STORY

How did
Oxford
extend
business
with c



CLOSE X



YOU CAN DRAMATICALLY IMPROVE PERFORMANCE AND SCALABILITY BY IMPROVING SERVER UTILIZATION LEVELS. Choosing servers with higher utilization levels—including nearly 100 percent sustained utilization—will help make sure your environment runs at optimum levels.



3

Enhance availability

No matter what workload you are delivering through the cloud, reliability and availability are critical. Your customers now expect service, information, support—you name it—to be available around the clock. Which means maintaining levels of availability at around 99.999 percent is no longer a nice-to-have. Business demands it. To meet these kinds of expectations, you need to make sure that each layer of your infrastructure has built-in redundancy and recovery.

Here are a few best practices to keep in mind:

- ◆ Solutions that deliver the ability to predict and mitigate failure through the stack as well as on/off capacity on demand
- ◆ Hardware and software components that provide for concurrency and workload redirection in the event of failure or maintenance
- ◆ Storage systems that employ local and global mirroring or redundant array of independent disk (RAID) technologies to help protect against data loss, and exploit technologies to enable point-in-time backup, without the need to shut down applications
- ◆ Networking technologies that deliver functions to provide fault-tolerant network connections
- ◆ Storage solution with grid scale architecture to deliver full redundancy and uninterrupted access to data



SUCCESS STORY

How did the state of New York grow government efficiencies with cloud?



CLOSE X

3

Enhance availability

CLOSE X

In the state of New York, all 1,600 municipalities were running independent applications on individual servers. An inability to share data and resources created government inefficiencies and limited access to services for citizens. To resolve these issues, the state began using a new municipal shared services cloud to dynamically manage thousands of virtual application stacks and provide highly secure, unique, collaborative user environments that provide real-time access to information and speed the development and deployment of new services. All while saving time and money.



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SUCCESS STORY

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PREVIOUS



NEXT

4

Rethink security

The rapid growth of data and devices puts pressure on multiple aspects of the infrastructure but also applies security pressure. As the number of connection points to the corporate infrastructure grows exponentially, so too does the threat those connection points pose. Whether it is mobile devices, sensors, actuators—the Internet of Things—security from the endpoint to the core is key.

Here are a few best practices to keep in mind:

- ◆ Comprehensive security that provides built-in protection and monitoring from the chip all the way through the stack, including:
 - Tamper-proof encryption cards
 - Encryption at rest
 - Partition isolation for multitenancy
 - Elliptic curve cryptography (ECC), a public-key algorithm that rivals—and may even exceed—RSA keys because of its shorter key lengths and lower processing overhead
- ◆ Architecture technologies that deliver the highest levels of security ratings to meet legal requirements and government regulations, including Common Criteria Evaluation Assurance Level 4+ (EAL4+) certification
- ◆ Solutions that protect critical data with high-speed encryption and centralized management
- ◆ Tools that provide early detection of application and network vulnerabilities to reduce operation risk
- ◆ Solutions that provide support for unique networks to segregate public, private and management traffic across distinct physical networks



5

Enable open integration

As you consider all of your infrastructure needs, you want to choose technologies that can help you get the most value from your existing infrastructure investments while still positioning you to take advantage of the opportunities your business leaders care about most. Open technologies are designed to allow you to tie systems together more easily to pursue new opportunities without adding cost or disrupting your core business capabilities. They also make it possible to leverage broad communities and ecosystems that accelerate innovation, so you can devote more time and energy to invention rather than reinvention.

Here are a few best practices to keep in mind:

- ◆ Applications that match your optimal sets of compute, storage and network resources
- ◆ Tools that allow you to manage heterogeneous environments securely and efficiently
- ◆ Open source software that is modular and reusable and allows you to easily combine components from multiple vendors
- ◆ Open source software with a licensing and commit code process that includes shared governance and transparency
- ◆ Technologies that enable interoperability based on standards from recognized entities rather than proprietary, de facto standards, which tend to be under the control of a single player
- ◆ Technologies that allow you to integrate across your choice of hypervisors and operating systems



For more information

For more information on other cloud topics, visit **The Steps to Cloud Expertise Series** at:

ibm.com/cloud/expertise 



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^{1,2} IBM, *The IT infrastructure conversation*, July 2014.

³ EMC Digital Universe Study, with data and analysis by IDC, April 2014.

⁴ ABI Research, “The Internet of Things Will Drive Wireless Connected Devices to 40.9 Billion in 2020,” press release, August 20, 2014.

⁵ IBM storage infrastructure optimization studies, 2014.

