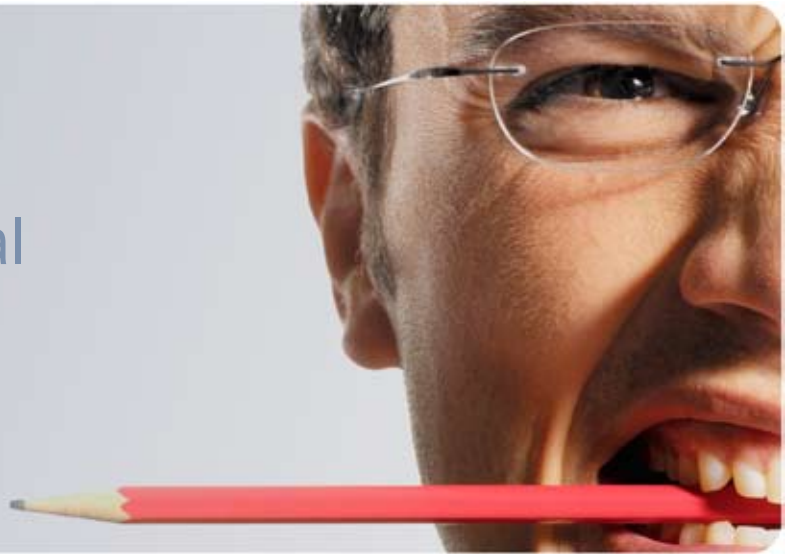


# UPTIME @ CRUNCH TIME™

Valuing the Need for  
Data Speed at Critical  
Business Inflections



**BPM**  
Forum

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## Introduction

There is no question about it. To be successful in today's digital world—indeed, merely to survive—enterprises must be able to accommodate and digest soaring volumes of data in real time. Time has always been about money in the corporate world. Never before, however, has this adage been so dependent upon the absorption and application of punctual data. Neither has this information been updated so continuously and rapidly, then disseminated so widely throughout enterprises.

Small wonder, then, that this mushrooming explosion of data is headed toward industries and enterprises, a global and unstoppable force poised to overwhelm the complacent or unprepared. IDC predicts that the information added annually to the digital universe will increase to 988 exabytes by 2010—that's nearly 100 million times the volume of printed data in the Library of Congress. Data holds the potential to either empower or overpower, depending upon how effectively a company can store, access, process and protect it. Companies that master the challenge gain an important competitive advantage. Those that fail to do so are mired in increasing complexity, rising costs, productivity lapses and performance breakdowns and bottlenecks.

The impact of massive data isn't distributed equally among industries. Some businesses still have breathing room to respond with state-of-the-art solutions. But others—especially those with products and business processes built on digital information—already are deeply embedded in the “impact zone.” And it is these companies—inside industries such as entertainment production, energy exploration, pharmaceuticals development and Internet services deployment—that have an insatiable need to make data a vital competitive advantage. The top achievers in these industries are leading a migration to very high-performance, highly scalable unified network storage. Ultimately, this will become a requirement for many other companies in an increasingly content-centric and data-driven economy.

For these companies, peak business performance is inextricably tied to seamlessly handling sudden spikes in user demand, accommodating lightning-fast data throughput, rapidly assimilating high bandwidth applications and quickly analyzing vast amounts of information. For them, “uptime at crunch time” is already a business imperative. They have no time for long waits for expensive fixes or delayed opportunities. In their eyes, “time to data” is equivalent to “time to money.”

Most important, these companies represent the tip of an iceberg. Top-level findings of the Uptime @ Crunch Time survey, sponsored by the BPM Forum and BlueArc Corporation, a leading provider of high performance unified network storage, underscore that fast storage networking has become critical to a vast majority of big businesses. Surges in computing performance peaks and other requirements outpace their ability to keep up, the survey shows, but companies now know this and worry about it. Similarly, the

## Introduction

survey also notes that most businesses today recognize that improvements in storage performance will lead to dramatic revenue growth.

Among the imperatives of the 21st century business environment is the maintenance of Storage Area Network uptime. The cost of SAN downtime can add up to more than \$100,000 per minute, according to recent reports by RBC Capital. Similarly, studies show that most U.S. businesses cannot function without computer support, and that those that suffer catastrophic data loss or an extended IT outage tend to go out of business. IT industry analyst firms estimate that enterprises, on average, lose \$84,000 to \$108,000 for every hour of IT system downtime.

Consider what is at stake in just one industry. High bandwidth digital production techniques have become essential to the creation of Hollywood's hit movies. When an animated feature film is scheduled to roll out across hundreds of theaters for a few precious weeks during the summer or the holiday season, it must be ready on time and deliver stunning visual effects. If production artists are unable to collaborate and finalize a digital print by distribution time, everyone involved begins to hemorrhage hundreds of thousands of dollars daily. If the deadline is completely missed, studios can be sued or go out of business.

The upshot: Computer capacity and performance are vitally linked, and large data files don't just sit idle. They must move at lighting speed—from workstation to workstation, continent to continent, deep into the ocean and back out again. This sort of performance is equally vital in other arenas, such as the judicial system. The lash of regulatory legislation, such as Sarbanes-Oxley, has been applied liberally to corporate officers, who face the risky responsibility for enterprise-wide compliance. Their lawyers must successfully navigate mountains of data in quest of specific records to defend their clients.

If there is any lingering skepticism about the crucial importance of speedy access to diversified and ever-changing data, gauge the results of the top findings of the Uptime @ Crunch Time Survey, based on responses from IT and diversified management executives. Their answers erase any doubt about the crucial nature of IT storage performance today.

The Uptime @ Crunch Time—Valuing the Need for Data Speed at Critical Business Inflections study included an online survey capturing responses from more than 125 IT professionals along with in-depth executive dialogs with select IT management completed in the first quarter of 2008. The survey represents a deep dive into the issues, drivers, challenges, imperatives and best practices in maintaining system uptime in the midst of exploding demand for increased data performance and storage.



## Introduction

The findings, summarized in the next section and detailed throughout the report, point to a keen recognition of the importance of data access and performance to the success of business and revenue growth. Respondents see the direct correlation between performance and their ability to speed time-to-market and time-to-revenue and avoid disastrous downtime scenarios. Yet, most are ill-prepared for periods of intense data flow that they know will come over the next year. Fifty-one percent have experienced productivity losses as a result of data overload at a critical business juncture, and a quarter of respondents relayed specific stories of how poor data performance has hurt their business.

Participants identified new forces that are driving the data deluge, including web services, rich media files, e-mail and messaging, and compliance. These factors, combined with the increasing potential for periodic spikes in traffic, are causing the need for more capacity and performance going forward. Nearly two-thirds are planning to add to their network storage in the coming year, and half of these companies expect to need 50 percent or more additional storage in the next two years.

It's onward and upward for these organizations as bigger and faster become the norm. As the world becomes more and more dependent upon information, the technology to handle the onslaught must keep pace. As IT organizations increasingly tie real business benefits to the technology and realize that highly powerful, affordable and scalable solutions exist, more companies will bridge the gap between their current state and full preparedness.

## Key Survey Findings

### **The ability to access and use data optimally is critical to a vast majority of businesses today.**

- Eighty-four percent or more said storage performance and data access by employees, partners and customers are important or very important to their business

### **Storage performance peaks and requirements are increasing rapidly, but companies are not keeping up.**

- More than a third of respondents surveyed said chances are good that they will experience a significant spike in data volumes and user demand over the next year, but woefully few are prepared to handle the onslaught
- Thirty-five percent said odds are 50–100 percent that they will see peak flows. Only six percent said there is little chance of this occurring
- Nonetheless, only 28 percent are “highly prepared” to handle the spike, and 56 percent said they are not prepared “at all” or only somewhat prepared
- Seventy-eight percent are not fully prepared to address any single spike of data at least 10 times greater than what passes through their networks in a typical day

### **Business and productivity are directly impacted by data performance.**

- More than 25 percent of respondents relayed stories about how insufficient data performance has already negatively impacted their business
- Fifty-five percent have experienced productivity losses as a result of data overload at a critical business juncture
- Even short-term performance glitches of one day can be catastrophic, say 55 percent of respondents
- Horror stories include:
  - “We’ve lost weeks worth of data when the database got corrupted, and we found out that the backup was corrupted too”
  - “Delayed reconciliations lead to delayed claims processing, which leads to loss of revenue”
  - “Engineering left data offline to overcome data storage performance limits, circumventing backup and revision control and putting product design data at risk”

## Key Survey Findings

### **Significant improvements in storage performance will lead to dramatic business benefits and revenue growth.**

- Eighty-two percent of respondents predicted that a doubling of storage performance would lead to an increase in revenues
- More than a quarter of respondents said that a doubling of storage performance would lead to a 34-100 percent increase in revenues
- Top business benefits cited from improved data storage performance were reduced application wait times (noted by 54 percent of respondents), more user access (noted by 41 percent of respondents) and faster access to rich media (noted by 34 percent of respondents)

### **Nearly two-thirds of respondents plan to implement or expand network storage in the next year. More than a third say their storage needs will grow by at least 50 percent over the next two years.**

- Expansion is being driven by:
  - Interest in enhanced reliability (67 percent)
  - Interest in enhanced performance (47 percent)
  - Interest in enhanced scalability (42 percent)

### **Individuals and companies at all levels are feeling the storage crunch.**

- A broad cross section participated in the poll, representing senior-level professionals at companies of all sizes in more than 20 industries
  - More than 50 percent were vice presidents or higher
  - Two-thirds represented mid-size or large businesses
  - The highest concentration of respondents came from financial services, professional services and IT companies

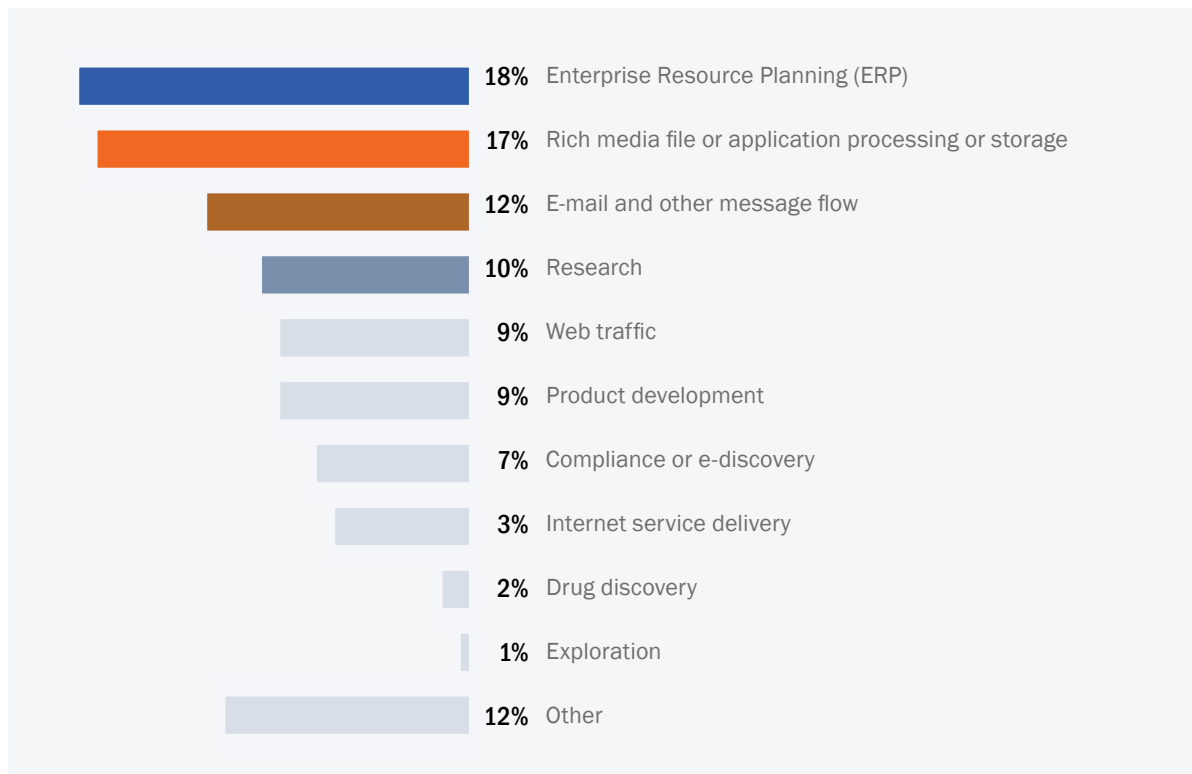
## Key Survey Findings

**A wide variety of strategic applications is driving the need for better data storage performance in the organization.**

- More than 10 application types were cited, but the top choices were:
  - Rich media files and applications
  - ERP applications
  - E-mail and messaging
  - Research
  - Product development
  - Web traffic

## Detailed Survey Findings

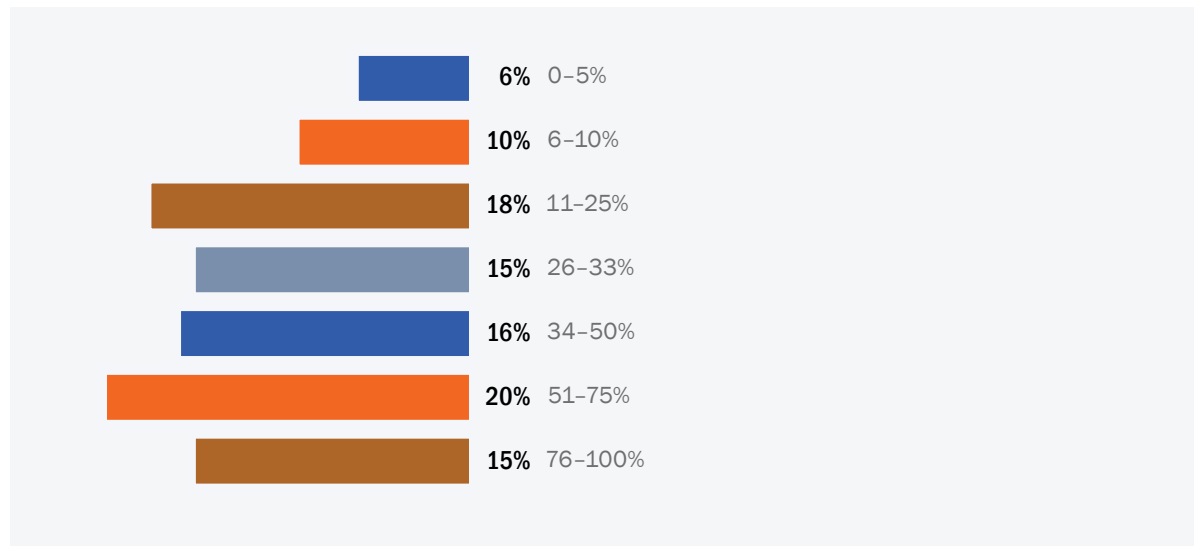
**What is the strategic application that most drives the need for data storage performance in your organization?**



The top applications cited by respondents include ERP applications, rich media files and applications, e-mail and messaging, research, product development, and web traffic. All of these enterprise applications, particularly for large organizations, are critical to business operations and success. They require peak data performance and are highly subject to crunch time spikes as well, driving the need for better uptime in these key application areas.

## Detailed Survey Findings

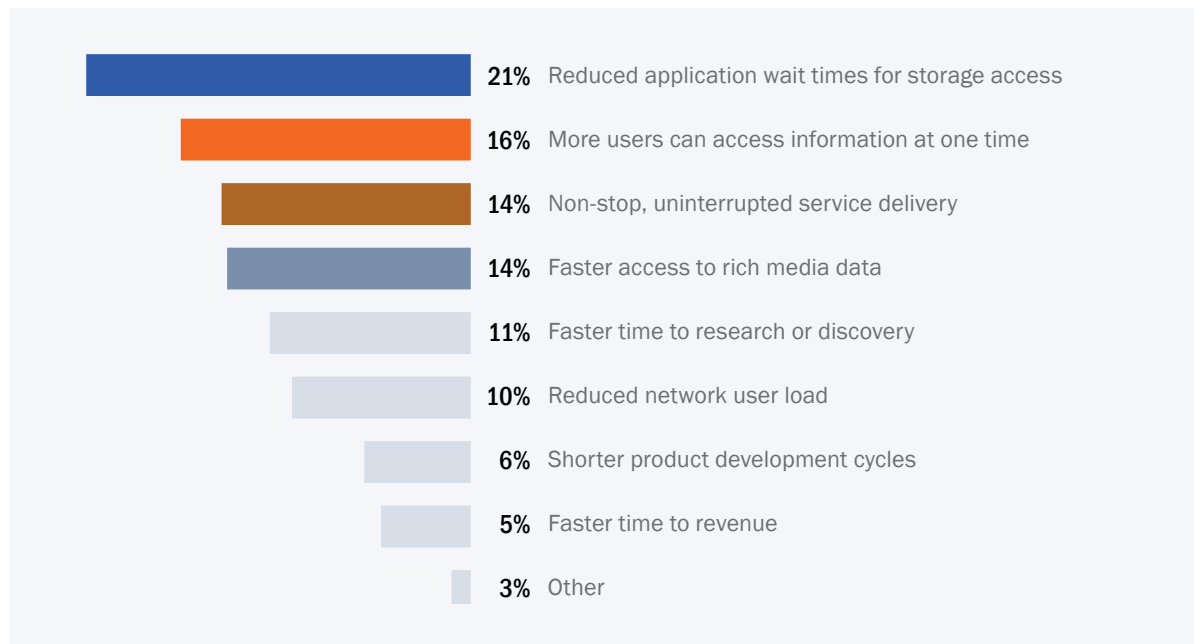
**What is the chance that your company will experience a significant spike in data volumes or user demand at any point over the next year?**



Respondents are aware of the impending massive data crunch and what that could mean for their business. At least 94 percent believe there is a chance that their companies will experience a spike in data volumes or user demand over the next year. More than a third believe their companies will probably experience a highly challenging spike in peak flows. Only six percent deem it highly unlikely this will occur at any point in the coming year. This data points to an extremely high likelihood that the next crunch time is near—and companies better be ready for it.

## Detailed Survey Findings

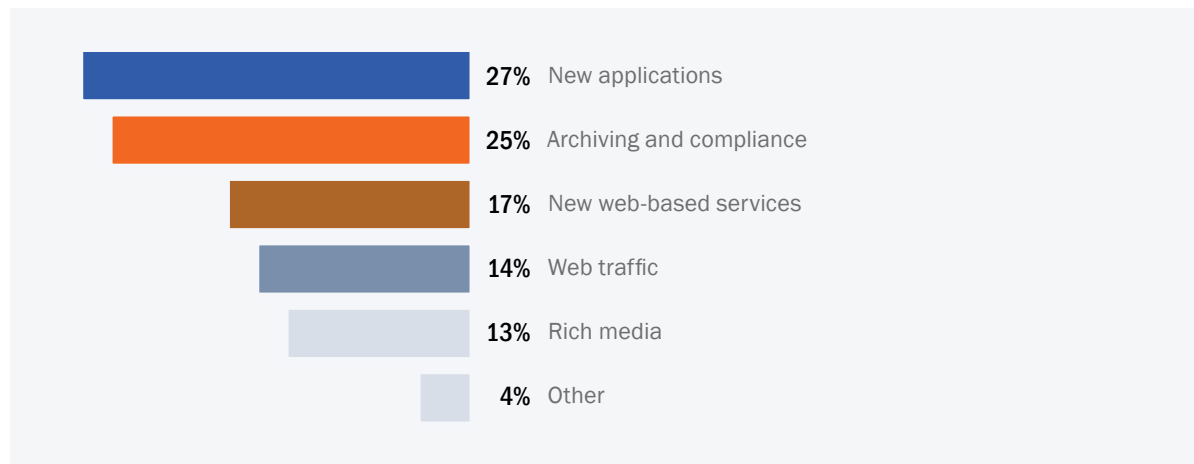
How would a significant improvement in storage performance most benefit your business?



The widespread range of business benefits gained by improved storage performance points to a multitude of success factors that can be achieved. From overall application wait times to service delivery, rich media and information access, and time to discovery, companies are realizing direct business gains across multiple vertical markets by boosting their data performance.

## Detailed Survey Findings

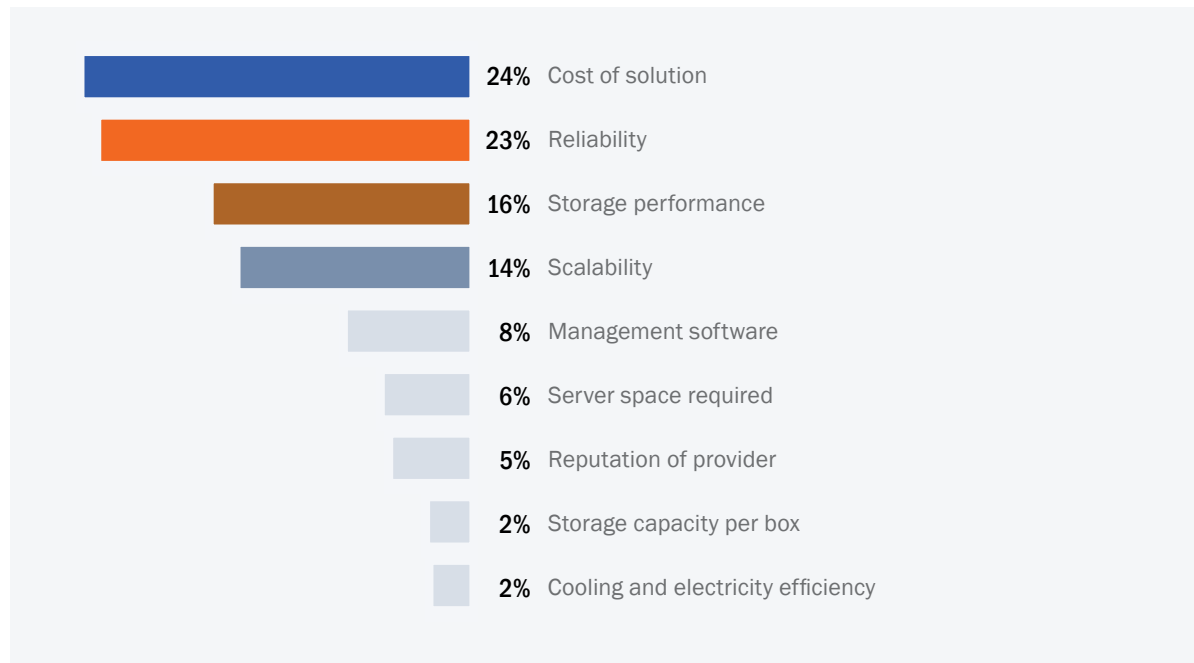
**What forces and factors are driving the need for increased storage and data access performance in your organization?**



When we look at the forces driving greater levels of performance, we see that new and dynamic challenges are at the forefront. New applications, recently imposed compliance considerations, and new web-based services are the biggest driving factors. This suggests that along with more established applications such as ERP and e-mail, a whole new generation of Internet and regulatory concerns are adding pressure to the mix.

## Detailed Survey Findings

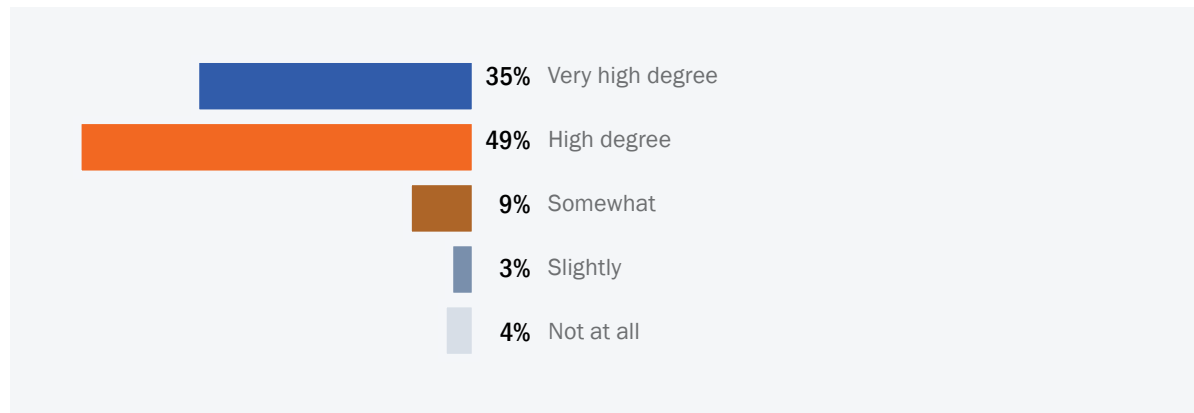
**What are the three most important selection criteria for your company in choosing enterprise storage solutions?**



The most important criteria are cost and reliability, survey respondents said. Twenty-four percent said that cost is the single most important consideration in choosing a storage solution. Reliability is a close second, with 23 percent underscoring the importance of uptime. Performance and scalability are also important selection criteria, ranking 16 percent and 14 percent respectively. Behind cost, the next three most important criteria are all key factors in uptime maintenance. Reliability, performance and scalability are all critical in handling the onslaught of data demands, and those that select based upon these criteria will be well prepared.

## Detailed Survey Findings

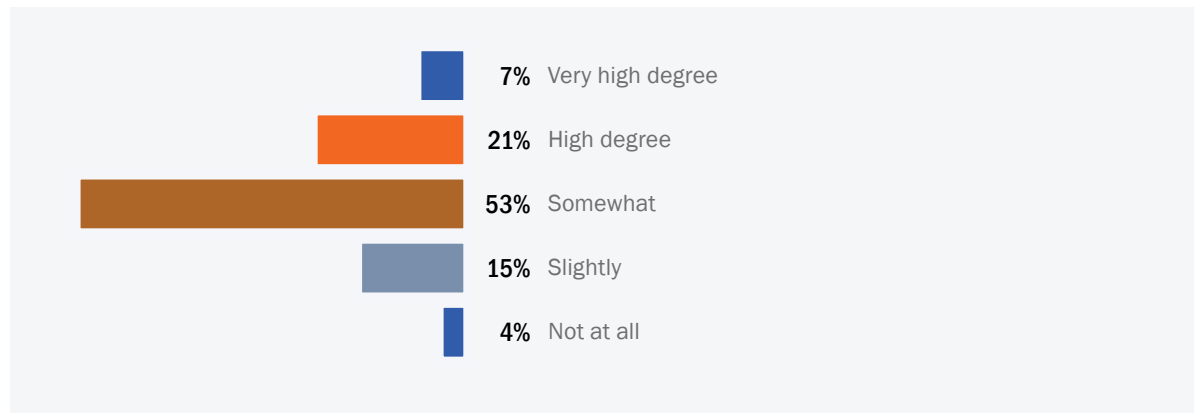
**How important to your business is fast, reliable access to data, content and applications by your employees, partners or customers?**



Eighty-four percent of respondents think that ease of access to data stored on their systems is very important or essential to their businesses. Only four percent do not agree with this. Yet, responses to several other questions show that companies overall are not well prepared to handle peak volumes, critical spike periods and mushrooming demands for data access. This discrepancy between the importance placed on uptime and the initiative towards addressing it should be a wake-up call to IT.

## Detailed Survey Findings

**How prepared is your company to deal with dramatic upsurges in data volume, file size or users?**



More than half of the managers surveyed do not think their IT departments are highly prepared to handle severe spikes in data volumes and user demand. Fifty-three percent said they are only somewhat prepared. Only 28 percent of respondents consider their companies to be well-prepared to handle the spike. This means that nearly three-quarters of managers surveyed need to improve their data systems to deal with an explosive increase in data volumes and user demands anticipated by a vast majority of respondents.

## Detailed Survey Findings

**Can you relate an incident in which insufficient data storage performance negatively impacted your company's business?**

**Lost weeks of data**

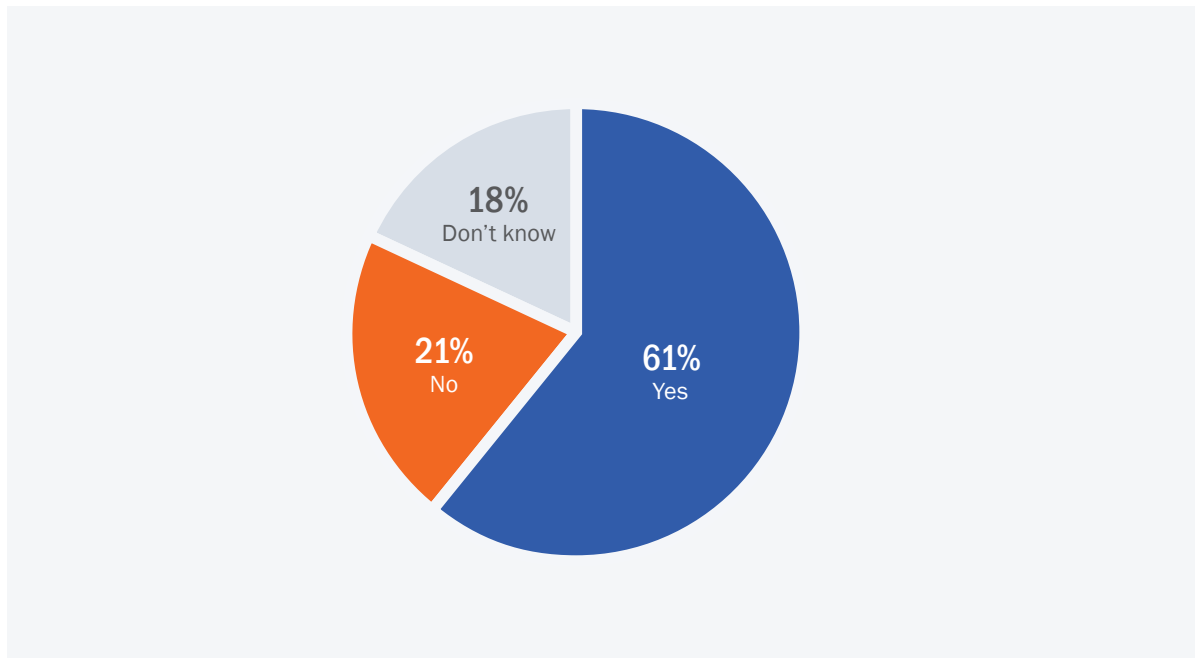
**Lost claims processing revenue**

**Production design data at risk**

Nearly half of all respondents relayed stories about how insufficient data performance hurt their business. “We’ve lost weeks worth of data when the database got corrupted, and we’ve found out that the backup was corrupted too,” said one respondent. “Delayed reconciliations lead to delayed claims processing, which leads to loss of revenue,” said another. Added a third respondent, “Engineering left data offline to overcome data storage performance limits, circumventing backup and revision control, and putting product design data at risk.” These are just a few of the disturbing stories that respondents shared.

## Detailed Survey Findings

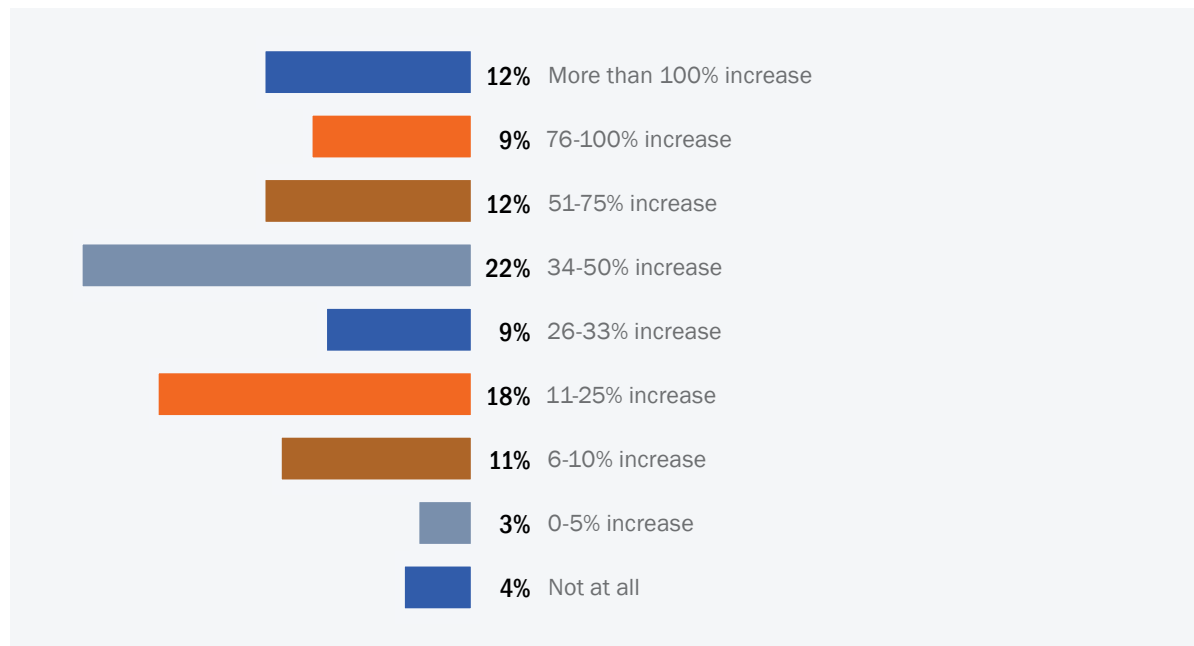
Is your company currently planning to implement or expand network storage in the next year?



Nearly two-thirds of survey participants confirmed that their companies plan to implement or expand network storage in the next year. This is consistent with survey findings that indicate that most consider data system performance important to their success. IT professionals are trying to handle the load by purchasing more computing power in the coming year.

## Detailed Survey Findings

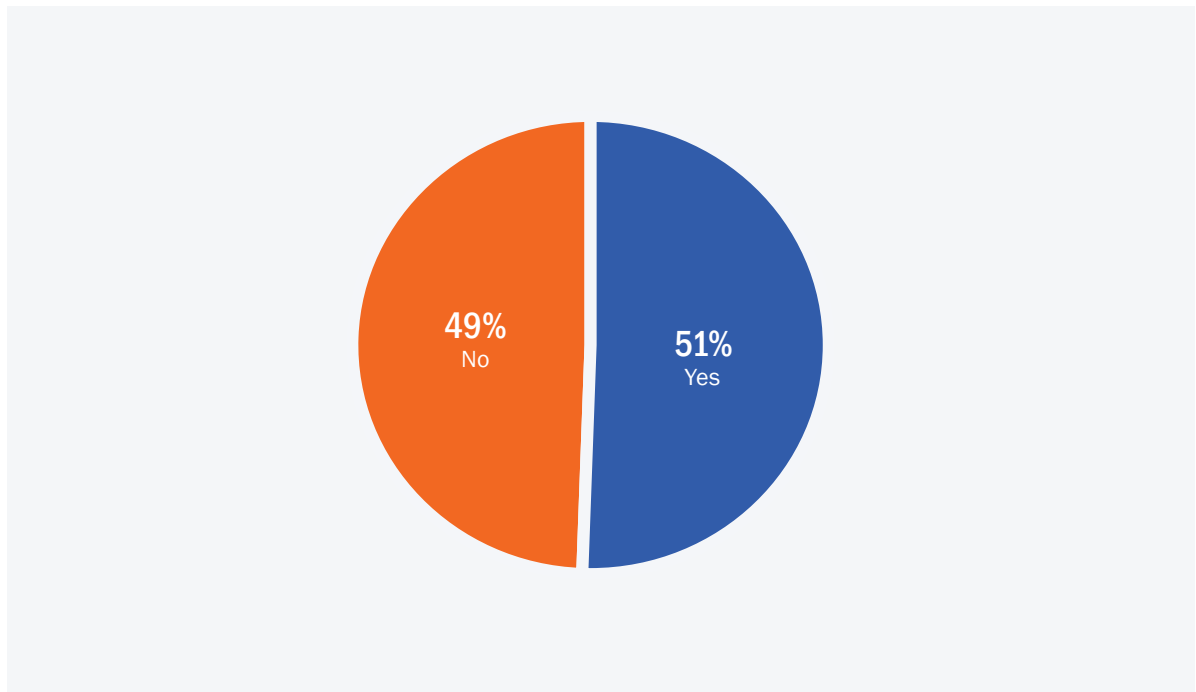
How much do you expect your data storage needs to grow over the next two years?



The vast majority of survey respondents said that storage needs are multiplying rapidly. Some think that enterprise data demands are likely to spring up suddenly. One-third of respondents said their storage needs will grow by at least 50 percent over the next two years. Only seven percent expect requirements to grow or extend by less than five percent. The data deluge predicted by IDC seems to be coming to fruition.

## Detailed Survey Findings

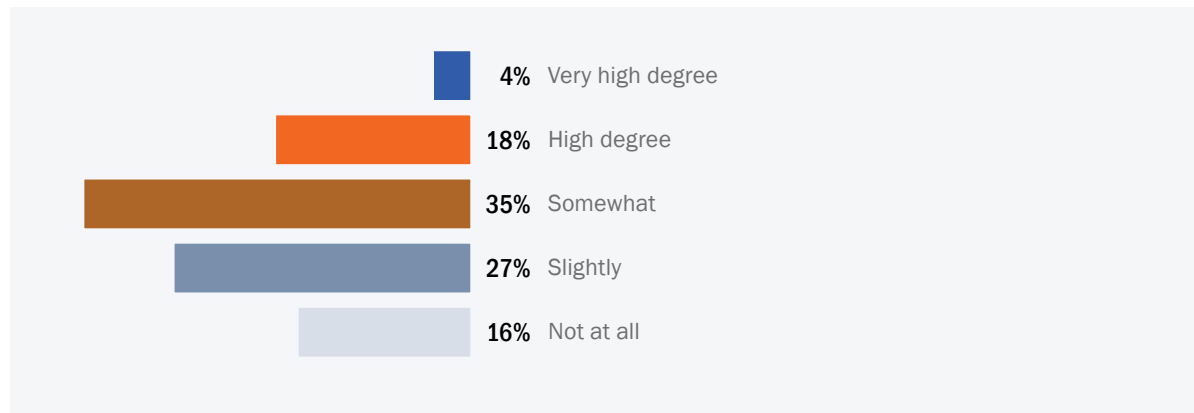
**Has your organization ever experienced a loss in productivity as a result of a data overload at a critical business time?**



Fifty-one percent of survey participants confirmed that they have experienced productivity losses as a direct result of data overload at a critical point. This adds up to tens or hundreds of millions of dollars in productivity loss, as analysts estimate that downtime can cost companies hundreds of thousands of dollars per hour on average. The threat of data overload is rising rapidly as new applications, services and regulatory demands put more pressure on overloaded systems to keep up.

## Detailed Survey Findings

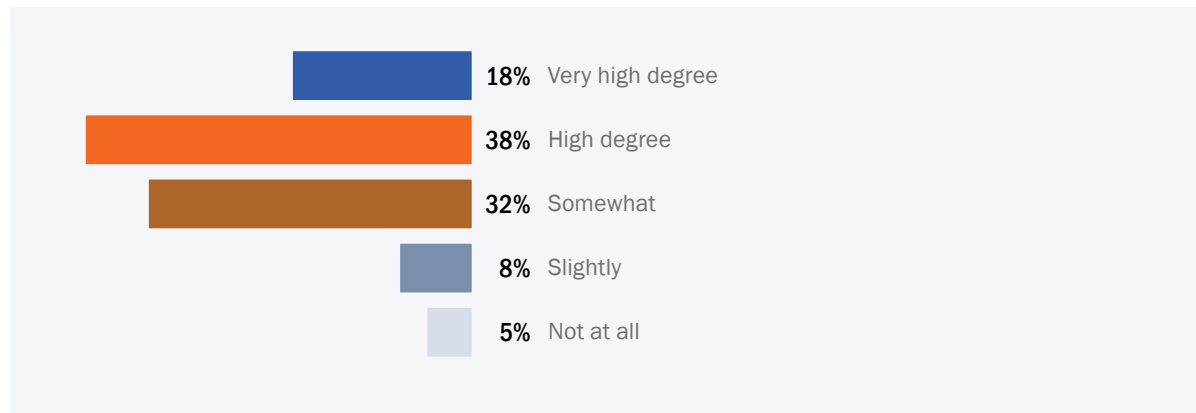
**How prepared are your company's systems to handle a spike of 10 times or more of the data that is normally processed in an average day?**



Seventy-eight percent said their companies are not highly prepared to address any single dramatic data spike. A negligible four percent feel that they are very highly prepared. These findings are troubling. Should a spike occur during a critical time, the implication is that serious productivity losses could result. The nature of many of these new application areas are also making spikes more common. For instance, at certain periods, Internet Service Providers (ISPs) need to handle huge peaks in traffic around a sales promotion or heavy streaming and downloads for popular videos. If 80 percent of ISPs can't handle these peaks, then the industry is due for system improvements.

## Detailed Survey Findings

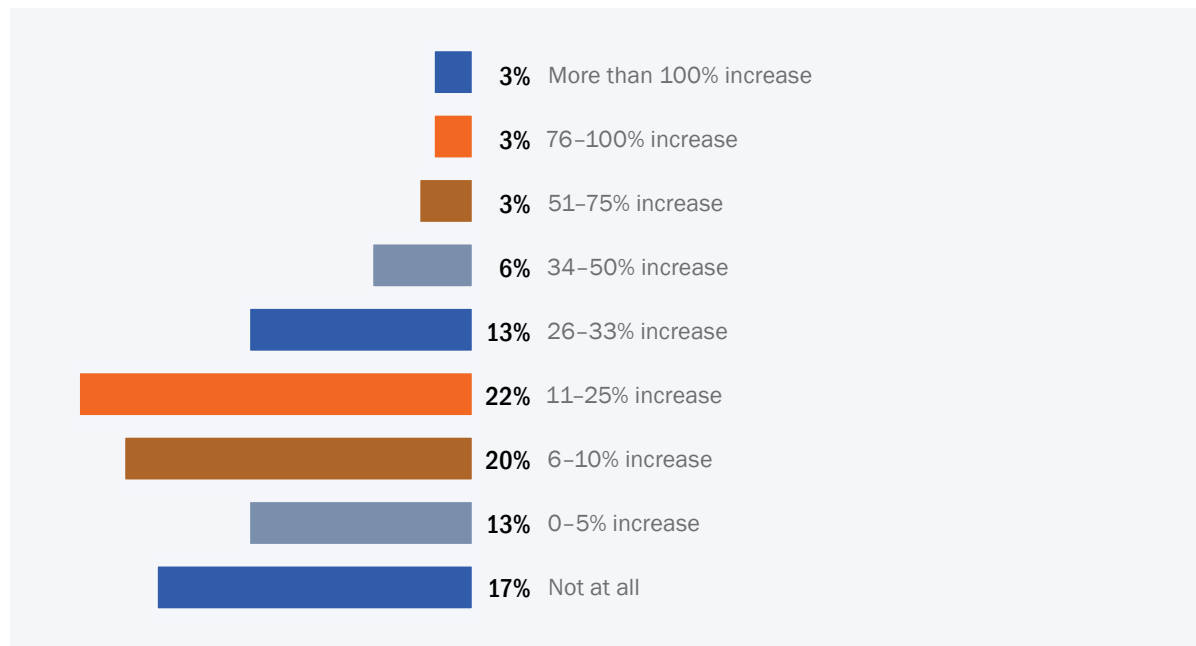
**How catastrophic would an outage or serious slowdown of data processing and storage of a day or more be to your business?**



Ninety-five percent of respondents said these problems would impact their businesses. In fact, 56 percent said that even performance glitches that last less than a day can be catastrophic to their companies. Only four percent said an outage would not be a serious problem. Clearly, most respondents agree that reliable and robust data systems are mission-critical to the survival of their business, and that small fractions of downtime in the scheme of things can be disastrous.

## Detailed Survey Findings

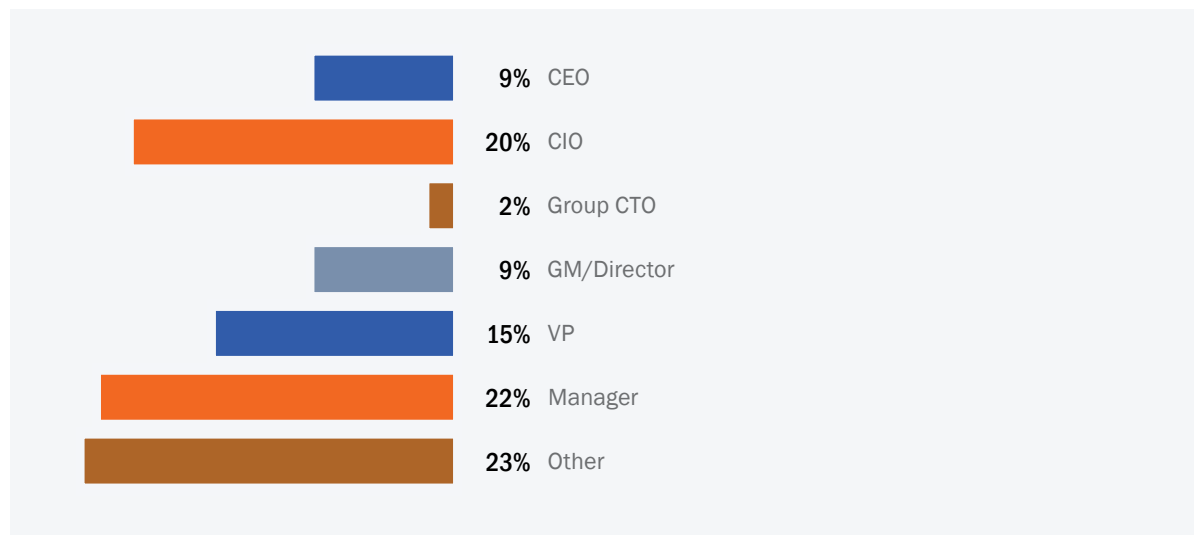
**If you had storage systems that could reduce processing time of your critical business applications in half, what effect might that have on your revenue potential?**



Eighty-three percent said that a doubling of storage performance would lead to an increase in revenues. Slightly more than a sixth of those surveyed did not think a strong boost in storage performance would lead to increased revenues. These professionals are not only linking data performance to the success and survival of business, but directly to top-line growth as well. A full 50 percent could grow their business by 10 percent or much more by halving their processing time. This can translate into hundreds of millions of dollars or more for larger companies.

## Detailed Survey Findings

### What is your title?



More than 50 percent of survey participants hold the title of vice-president or higher. Senior level professionals at companies of all sizes in more than 20 industries were represented in the responses. These results show that individuals at the highest levels are understanding the impact of data performance on business and are feeling the crunch of ill-prepared systems. They are also in the best position to enact the necessary changes and improvements to address the situation.

## Detailed Survey Findings

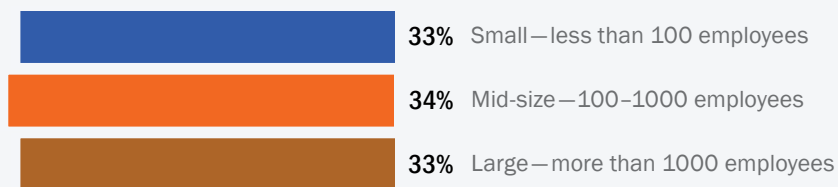
**Which industry sector best describes your company's focus?**

17%	Information Technology
16%	Professional Services
12%	Financial Services
10%	Automotive
8%	Manufacturing
7%	Government
4%	Wholesale/distribution
3%	Telecommunications
3%	Pharmaceuticals
3%	Insurance
3%	Education
2%	Transportation
2%	Aerospace and Defense
2%	Packaged Goods
2%	Energy
2%	Media and Publishing
1%	Retail
1%	Electronics and miscellaneous technology
1%	Life Sciences
1%	Construction
1%	Entertainment

Overall, a broad spectrum of industries participated with the highest concentration of respondents in IT, professional services, financial services and automotive.

## Detailed Survey Findings

### What is the size of your business?



Survey participants work for an even mix of small, mid-sized and large companies as defined by employee size. For the large companies, archiving and compliance was the number one factor driving the need for increased storage and data access, and nearly two-thirds of them plan to expand network storage in the next year.

## Executive Dialogs

The following section is a summary of dialogs the BPM Forum conducted with executives from IT departments on uptime issues and imperatives.

**Noel O.**

IT Training Section Head

Financial Institution with Over 1,200 ATM Locations

Financial institutions understand the importance of maintaining server performance because these organizations rely heavily on computer systems to maintain financial records and time-sensitive transactions. The challenge of this company is keeping over 1,200 ATM terminals running at five nines throughout the Philippines. According to Noel, “In the financial services market, our customers are overly critical of the variety of services we offer, where our ATMs or branches are located, and response time of our systems. Over the years, the need for system uptime/availability has sharply increased, and will continue to increase in the future. Businesses that offer the best services will get the market share.”

Noel states that there are several factors driving the need for increased storage and data access performance. A challenge after two financial institutions merge is to effectively consolidate office branches to ensure that servers, software, and equipment are standard and consistent across the vast distribution network.

“Over the years, the need for system uptime and data availability has sharply increased, and will continue to increase in the future. Businesses that offer the best services will get the market share.”

## Executive Dialogs

During critical business operations, data corruption and hardware/network failure are the most common occurrences affecting server uptime. Noel states that this situation results in lost productivity for their employees and lost business opportunities for their clients and customers.

As is common with most financial institutions, it is critical to have fast and easy access to appropriate data. Stiff competition, local and regional market climate, and increasing customer demands compound the issue. As she explains, “our business is all about service, availability, variety and flexibility.”

**I would grade the industry on handling uptime at 70–80 percent as a whole, but this is not only dependent on the banks’ systems, it also has a huge dependence on telecommunication lines. Network timeouts have a significant effect on uptime performance.**

## Executive Dialogs

### **Yusuf Lanewala**

IT Advisor

Saraswat Bank

The need for data system uptime is critical to a vast majority of businesses today, and Saraswat Bank is no exception to this rule. As information and knowledge have become more and more important to maintaining a competitive edge in today's business climate, the need to ensure data availability has become invaluable. According to Yusuf Lanewala, this need has changed dramatically over the last year. Now, all major systems are expected to be online and running 24 hours a day, seven days a week. In addition to meeting these expectations, data volume has increased substantially. In some cases, the volume of data has doubled.

Many factors are currently driving the need to optimize data system performance. According to Lanewala, technology and the banking industry have both changed quite significantly over the last several years. In the past, customers expected banking services to be available during "banker's hours." One of the challenges that IT professionals in this industry must face is providing customers with full banking services all day and every day, across all channels. This means that all of the organization's data systems have to be available on a 24 hour basis 365 days a year. To complicate this business problem, regulators continually increase requirements for banks to maintain greater volumes of data for longer periods of time. Thus, the need for increased storage is rising exponentially. Other concerns also serve to drive the need for more powerful storage solutions. These concerns include providing and maintaining internet banking services, online stock trading capabilities, and archives of data and e-mails.

**“As information and knowledge have become increasingly important requirements to maintain competitive edge, the need to ensure data availability has become key.”**

## Executive Dialogs

Like every organization of its kind, Saraswat Bank must actively work to prevent data overloads. This is especially true during critical business times. Any such overload can result in a loss in productivity that can significantly impact a business. Lanewala must carefully balance the need for rapid data access with the need for reliability. For example, online banking customers who use services such as cash withdrawals, loans and deposits need to be able to access multiple channels across a variety of locations. Customers and other stakeholders expect a “reasonable” response time. This response time becomes shorter and shorter every single day. If they cannot provide easy and speedy access to data, they lose customers.

When asked to give a grade to the financial industry, as a whole, with respect to industry-wide effectiveness for maintaining uptime during the most demanding times, Lanewala said: “During heavy loads and during peak online transaction times, as well as during end-of-day or end-of-period batch jobs, the requirement for high-availability is critical. The reality, in general, is that most organizations do face a crunch during these times.”

**“Regulators require banks to maintain a greater quantum of data for a longer period of time. This also drives the need for increased storage. In addition, internet banking, online share trading, the need for archival of all data and e-mails, and other business requirements have also driven the need for higher storage up.”**

## Executive Dialogs

### **Kelly Ison**

Director of Business Process Management  
OSI Restaurant Partners

The restaurant industry is keenly aware of the need for operational process improvement projects that are both cross-functional and worldwide. According to Kelly Ison, such projects can be accomplished by aligning process improvement initiatives with business performance management. Ison uses cutting-edge transformation approaches to ensure uptime at critical times. Ison employs Lean Six Sigma techniques that focus on speed and quality in order to deliver data performance systems that produce better data quality results at a faster rate than traditional solutions. She also values stream mapping, a technique used to analyze the flow of materials and information, to align various processes across multiple departments.

Ison advises that IT organizations focus on starting initiatives for cost savings and effective communication within the IT department. To do this, Ison suggests analyzing how information and money flow through an organization, then identifying major conduits through which the bulk of these resources flow. Once these conduits are identified, the quality of data can be verified more effectively. These initiatives are critical with respect to departments which get audited frequently. According to Ison, organizations should strive to create end-to-end solutions that incorporate all processes from all departments. In order to accomplish this goal, it is critical to understand what processes the organization already has in place that can be leveraged to maintain an uptime system.

**“We are truly trying to create best practices within our company from the corporate office throughout our restaurants. We’ve always had high standards in the restaurants, but I see that we are actually stepping that up.”**

## Executive Dialogs

Ison asserts that several factors are compelling companies to expand network storage and speed up data access performance. She states that across the industry, senior level executives are placing a greater importance on data quality. A year ago, speedy resolution of system failures was considered proactive. Today, IT professionals are responsible for preventing data quality problems before issues arise. This change has happened because the cost associated with reconciling data quality issues has risen considerably, and these costs continue to grow. Another significant factor that is driving the need for better storage and data access performance is the need for best practices regarding increased productivity. Consistency and simplicity are also critical to ensuring optimal data performance. This is especially true with respect to service and project management processes because they require increasingly large volumes of data. All of these conditions are driving the need to increase data storage.

Ison says that if she were to give the restaurant industry an overall grade, she would give it an A- Even though OSI is not a technology company, C-level management understands the need to improve the company's technology. She believes that the industry needs to model itself after the technology industry, because an incomplete transaction or lost customer data can lead to revenue losses.

**I can tell you that over a year ago, it was considered proactive to fix problems. Now, it's not proactive to fix problems after the fact. It is proactive to solve them prior to something happening.**

# The Challenge of **CRUNCH TIME**

Uptime @ Crunch Time | WHITE PAPER

The rising juggernaut of data overtaking today's enterprise and vertical industries is approaching with the deep rumble of something massive, global and unstoppable, ready to overwhelm the complacent and obsolete the unprepared. Like any huge force, data holds the potential to either empower or overpower, depending on how effectively your company can store, access, process and protect it. Companies that master the challenge gain an important competitive advantage. Those that don't are bogged down in increasing complexity, rising costs, productivity lapses and performance breakdowns.

The impact of mass data is not distributed equally among industries. Some businesses still have breathing room. Others, especially those with product offerings and revenue-producing business processes built on digital information, are already deep inside the impact zone. It's these companies—in industries such as entertainment production, energy exploration, pharmaceuticals development, and Internet services—that are driving major innovations in information storage with their insatiable need to make data a vital asset and competitive advantage. The top achievers in these industries are leading a migration to very high-performance, highly scalable unified network storage, which ultimately will become a requirement for many other companies in an increasingly content-centric and data-driven economy.

For these companies, peak business performance is inextricably tied to seamlessly handling sudden spikes in user demand, carrying out dazzling feats of data throughput, rapidly assimilating high bandwidth applications, and protecting and analyzing vast amounts of information. For them, "uptime at crunch time" is already a well understood business imperative. They have no time for expensive fixes, long waits or delayed opportunities. Time to data is equivalent to time to money.

To understand the critical business importance of uptime at crunch time, consider what's at stake in today's entertainment industry, where high bandwidth digital production techniques have become so essential to the creation of Hollywood's hit movies. When an animated feature film is scheduled to roll out across hundreds of theaters for a few precious weeks during the summer or holiday season—with the expectation it will provide a major share of the parent company's revenues for the year—that movie had better both deliver stunning visual effects, and be ready on time. If production artists are unable to collaborate and finalize a digital print by distribution time, everyone involved begins to hemorrhage revenue—to the tune of hundreds of thousands of dollars per day! Studios can even be sued or go out of business if they miss altogether. Meanwhile, delays in data-intensive pharmaceutical drug discovery processes can be even more expensive. The total cost of discovery for just one new drug can surpass \$100 million.

In these industries, the need for highly scalable, high-performance and highly available storage systems capable moving huge amounts of critical data and performing other content-intensive processes is absolutely essential to maintaining business continuity and driving revenue. Industry pressures are

scaling just as fast as the volume of information, and companies must make the right storage decision to enjoy the benefits of data.

As a business decision, the storage architecture a company chooses is key to that competitive advantage. In a content-rich world, a storage vendor should make life easier for the customer—faster time to revenue, high availability, faster crunching—all at a good ROI. For those reasons, the best approach these days is nearly always a unified file system for its simplified management and lower support and TCO costs.

BlueArc Corporation, for example, with its powerful parallel computing and innovative hardware-accelerated network storage architecture, delivers a highly scalable solution that can parallelize the function of all components, achieving massive data throughput, alongside rich navigation capabilities and scalable management. Memory is ample, expandable and distributed—eliminating the bottleneck in accessing memory-cached data. With such vast storage and file space, the company's Titan 3000 systems serve as a growth path for rapidly expanding data-centric businesses, reaping consolidation and performance gains.

#### **Storage as Strategic Resource and Urgent Imperative**

The fact is that capacity and performance are vitally linked, as information is not static but dynamic. Large data files don't just wallow, they have to move at lightning speed—from workstation to workstation, continent to continent, deep into the ocean and back out again, even to and from outer space. Back on Earth, the lash of regulatory legislation such as Sarbanes-Oxley has been applied liberally to corporate officers, who are at risk of being held personally responsible for enterprise-wide compliance. They need the ability to delve through mountains of data to find granular records—and they had better be the right ones! Non-stop customer service is a no-excuses expectation and a major competitive issue.

Escalating content and data requirements have created a carrot-and-stick situation, in which revenue, productivity and competitive advantage reward those companies that recognize the value of allocating resources to advanced storage technology for high-performance computing. On the other hand, the consequences of trying to “make do” with outgrown legacy systems in order to postpone new capital investment may find that instead they are losing out on lucrative business opportunities due to lack of capacity and scalability. Uptime at crunch time demands that a company think strategically to accommodate spiraling growth and high throughput demands. That's why BlueArc Corporation, who provides the industry's most high-performance and highly scalable unified network storage solution, with the capacity to manage up to 512 terabytes of data in a single storage pool, and up to 10 Gbps of throughput, is so widely used as a key infrastructure component in industries highly challenged with uptime at crunch time.

**Entertainment: The Uptime Crunch is No On-Screen Fantasy**

Audiences who marvel at the sizzling special effects in their summer blockbusters are unaware of the massive files that had to be hoisted around the post-production lab to achieve those visual extravaganzas. But the company that contracted to create and deliver those files to a major studio on deadline probably thought about little else.

Without mass storage, all those jaw-dropping special effects, realistic graphics and complex action sequences start to drag as applications become “data bound.” The information may be there, but it’s moving too slowly to form a coherent flow of images or allow for agile post-production editing. No wonder that the entertainment industry has been a major driver of progress in storage solutions, due to the richness of the product. The profit potential underlies the continual pressure for high-performance computing solutions—and not just for theatrical releases, as high performance computing makes its way toward laptops or even handhelds with its rich content for gaming and other popular applications.

Collaboration and cross-fertilization are at the heart of the entertainment industry’s creative processes. The need for swift sharing of high-definition files among workstations during production has overwhelmed traditional solutions, which distributed data across compute nodes rather than concentrating it in a single, easily accessible virtualized storage pool. As the size of files grew, limited scalability hampered creation, manipulation and file sharing among artists and editors. “Hangs” due to I/O timeouts, data loss and degradation were common miseries of inadequate storage resources.

A whole new approach to storage would be needed to take on the demanding processes and throughput requirements of modern studios. With premium-priced creative talent on board, studios must provide an environment up to their needs—one that’s capable of rapidly serving up huge files of data to multiple workstations in order to allow the artists to rapidly build, revise and improve complex images. Innovative computer-generated imagery (CGI) creations moving on ultra-high-speed networks demand storage that won’t bottleneck, drop frames or impede renders.

In fact, BlueArc systems have become standouts in major Hollywood applications, allowing entertainment companies to create, render, share files and deliver rich, complex content with speed and accuracy. BlueArc’s high performance and throughput let users manipulate data to create special effects and animation with virtually no downtime or degradation. Post-production tasks flow smoothly. The system helps to optimize efficiency of expensive equipment, meet deadlines and bring in revenue.

When it comes to CGI, BlueArc offers lightning-fast performance and huge capacity, giving artists the agility to manipulate their massive files to create an astounding audience experience.



### **Data: The Life Force Driving the Life Sciences**

The quest for a robust storage infrastructure that can scale and adapt to rapidly evolving needs is a major priority in today's life sciences industry, most particularly because of its benefits in the complex, costly process of bringing new drugs to market. When it comes to healthcare and pharmaceuticals, the challenges are truly profound—and the stakes couldn't be higher. The alchemy of turning raw data into high-value medical breakthroughs demands truly robust systems that store, save and handle information with agility and integrity. The cost of developing promising new therapy through years of research, discovery, product development and testing often runs into the hundreds of millions of dollars.

For the life sciences, the uptime crunch is about saving and improving lives—and also ensuring the viability of major corporations that stake huge resource bets and shareholder wealth on new medications, their research and trials. The ability to extract verifiable facts—the true efficacy of a new drug—from all of this information rests to a very large degree with that company's storage capacity, its scalability and performance.

Pharmaceutical research needs robust resources, not only to perform essential bioinformatics and cheminformatics functions, but to control costs associated with these processes. High-performance storage spurs collaboration and sharing among researchers who can quickly and easily access a vast central data pool hundreds of terabytes in size. That, in itself, saves costs by lessening wasteful duplication. High-performance storage accelerates functions such as nucleotide comparisons and analysis of molecular structures for informed evaluation, promising drugs move ahead faster to market, while researchers focus on meeting milestones, rather than waiting for data on results. Most importantly, containing research costs and speeding results helps deliver lifesaving drugs to those who need them—the true goal of the research—and at lower prices.

The proven acceleration ability of BlueArc's Titan 3000 system, with its 256-terabyte file system capacity and cost-effective, modular, architecture translates into quicker, more accurate results, allowing researchers to work more effectively, results can be extracted from larger samples for greater accuracy—and research can become benefits for desperately waiting patients.

### **Crunch Time for Internet Services—Challenge Brings Opportunity**

People take internet services for granted—a commodity as fundamental to our society as the telephone. But the storage needs of its service providers are truly daunting: The ability to provide uninterrupted service is key to survival amid unprecedented and freewheeling global competition. In a relentless competitive climate, a brand becomes precious and hard to sustain as customers are lured to go elsewhere at the click of a mouse. In the digital world, customer satisfaction is vital to retention, outages are deadly—and it all rests on storage and performance—the ability to scale as



high as hundreds of terabytes and handle billions of files without degradation, to keep pace with data demands. Add to this the need to launch popular new bandwidth-intensive services and programs that attract new customers and drive revenue growth. The inability to achieve uptime at crunch time, result in slowdowns, and worse, system failure—leading to significant short-term and long-term financial losses in missed sales and lost customers.

They wouldn't have it any other way—and with the right storage solution, they can easily push new services out to more users, and do it at amazingly low cost. In essence, they can turn the most daunting aspects of crunch time into the very means of driving success. But the storage system has to be formidable and robust enough to handle the traffic, plus flexible enough to manage spikes in demand. Nothing is more embarrassing or financially damaging than to launch a new program that lacks the infrastructure to perform. But with BlueArc's Titan offering, Internet Service Providers now have a centralized architecture that eliminates the need to distribute data across many systems to handle user load. Titan's unified architecture is robust enough to handle huge demand even as it simplifies data management of billions of files.

#### **E-Discovery: Revolutionizing the Law and its Processes**

When Charles Dickens wrote "Bleak House," he was satirizing a legal system so mired in process that the very assets being litigated were dissipated in the course of the litigation. A solidly reliable storage infrastructure capable of maintaining relevant data for years on end is essential to systems of law and justice worldwide. It has taken the arrival of mass digital storage to bring true agility to the precedent and records-intensive legal world. Now, mass storage and high-performance search are placing relevant files in the hands of counsel under time constraints that would have been unheard-of only a few years ago. Rock-solid reliability and capacity of storage resources are key to scaling and performance in order to manage and handle storage-intensive archiving, processing and analyzing functions on the billions of files involved in litigation and compliance cases. Not only is robust storage more reliable and faster, it is far more cost-effective, reducing court costs and fees for document handling and evaluation as automated processes replace assistants toiling away in legal archives. Results are delivered to the legal team in a timely manner to move more cases toward resolution and serve justice. The stakes of such legal activities can be huge—recently, Morgan Stanley lost an award judgment for \$1.4 billion due in part to the inability to keep and retrieve their e-mail assets.

BlueArc's network storage systems address these vast storage requirements, maintaining and making available huge numbers of often very small files. BlueArc's Titan 3000 practically eliminates bottlenecks in file-processing, thanks to its unique approach to file system and I/O management logic in silicon rather than software. Even with dramatic spirals in case loads, BlueArc technology can handle all facets of legal

documentation. The hardware file system, freed from I/O bottlenecks, outpaces competitive offerings by four to ten times. Plus, the accuracy and speed of directory lookups, file access, extraction and processing is smoothly handled—expediting the most complex cases with verifiable information.

### **A Company that Lives High-Volume Storage**

To demolish revenue-gobbling bottlenecks and process high data at blazing speed, every step in the movement of data between network and disk needs to be streamlined. To do that, BlueArc's Titan 3000 uses a bi-directional multi-pipeline taking separate paths for input and output and blends the best of NAS and SAN for economical performance optimization. Robust storage architectures allow multiple nodes to share access to the same SAN storage resources and further heighten performance for business-critical applications.

Titan's robust architecture parallelizes up to 256 terabytes of networked storage in a single unified global namespace. Scaling such a robust system upwards is as easy as adding another storage device on the network. Another key advantage is that it does not need an operating system at all—not Windows, Linux, or UNIX (as do other NAS servers), making it invulnerable to common hackers and ill-intentioned viruses or worms.

In the past, NAS supported mostly file-based applications in light-to-moderate traffic storage environments. No more. NAS has proven itself to be more than ample for the richest, most demanding tasks. More block applications now reside on NAS than on SANs—while sophisticated schemes like that of the BlueArc Titan combine NAS performance with SAN scalability. Management tools and virtualization hide complexity from the user for a win-win implementation.

With its exceptional NAS-based performance, BlueArc is launching products that easily handle applications for which SAN storage is normally recommended, such as database or e-mail systems. Thanks to its highly efficient and popular backup software, backing up the BlueArc Titan is serverless and LAN-free. BlueArc, with its fully scalable architectures and robust management are fully capable of keeping high-volume systems available. With their ability to consolidate and huge throughput capabilities, BlueArc products can handle massive tasks of navigation and management—a radical departure from traditional hierarchies and hands-on IT.

### **Conclusion**

There is no going backward. From now on, bigger and faster will be the norm. But the value of a storage technology does not lie in numbers on a page or on a screen, but rather in the real benefits it delivers to businesses that invest in and rely on it. As the world becomes increasingly dependent on information,

the technology to store and handle that information must keep pace, accommodate future needs—and do it all affordably. For a company such as BlueArc, the determination to keep demolishing performance thresholds has not only benefited the company and its customers, but has broadened the potential of NAS technology itself: innovative hardware-acceleration, dynamic scalability, robust support for millions of files per directory, innovative unification of NAS and SAN technologies for supremely cost-effective performance, as well as many other pioneering capabilities are playing a major role in the advancement of storage technology. Smart storage strategies are giving BlueArc a premium market position and helping to bring sustainable computing practices to the industry.

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