



Competitive Snapshot

Painting the Big Picture:
Data Storage and the Benefits of
End-to-End IT Solutions

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INTRODUCTION

The past decade has been a tumultuous period in IT history. In the years leading up to the dotcom mania, enterprise demand for IT solutions led to an explosion of products from both established and untested IT vendors. Coupled with later enterprise consolidation trends, these offerings helped drive businesses toward deploying increasingly heterogeneous devices and systems, resulting in highly complex enterprise computing environments. As a result, many companies worldwide entered the new millennium over-provisioned with often underutilized and difficult to manage IT resources. Since enterprises continue to expand the business processes they support with technology solutions, they have sought guidance from established systems vendors to more efficiently utilize existing IT infrastructures.

However, the reliance of enterprises on IT and IT vendors has been complicated by economic malaise and political uncertainty, causing serious quandaries over which technology solutions enterprises should focus on. In particular, businesses have continued or increased their dependence on data storage solutions. At the same time, the storage industry itself has been changing, with many vendors reacting to customer desires and shifting towards secure, pervasive access to business information across a range of infrastructure technologies and delivery devices.

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Enterprise Storage: Driving Issues

As part of this change, a few simple yet critical issues are driving storage trends and the elemental conviction that effective storage solutions are crucial to businesses' efficiency. First is the irony that while companies have been severely impacted by global economic and political events, the data holdings of IT-enabled enterprises continue to grow. This is in large part due to the increased understanding that information is a critical business asset.

Additionally, while much of the data any business gathers is purely practical in nature (internal documents, R&D findings, purchase orders, customer and partner contracts, sales and marketing statistics, etc.), other material is more difficult to qualify. For example, email and other employee-generated correspondence have, for good and occasionally ill, replaced the "paper trail" of traditional business dealings. Given both simple necessity and increasing regulatory demands within specific industry sectors, enterprises need effective data storage solutions to help organize and maintain these steadily accumulating masses of information.

Finally, as the nature of enterprise data is evolving, so logically is data access. After all, if digitized information is business-critical, restricting data availability can have practical or even potentially deleterious consequences. Interestingly enough, new generations of storage, networking, and wireless technologies can, in theory, deliver corporate information to virtually any location and device, providing businesses with a variety of solutions to their specific needs.

Exploring Pain Points

While data and data storage are growing in importance to business processes of every stripe, what does this mean for enterprise decision makers? The truth is that every IT solution's benefits must be balanced against its potential pain. Marketing hype aside, everything costs something. The test of a business solution's effectiveness is whether its overall benefits outweigh its overall human, corporate, and financial tolls. This being the case, what do we see as some of the more significant driving factors and potential pain points for enterprise storage solutions?

Enterprise IT complexity continues to expand

The IT boom helped populate enterprise networks with products from a range of both well known and long-forgotten vendors, and the trend has continued even as fortunes in the IT sector declined. The initial drivers for this are obvious enough. The concept of inexpensive network-attached devices including storage solutions was not fully embraced by some vendors until market demand developed. While some saw this trend as a simple point product opportunity, it actually portended a greater shift toward what might be called "have it your way" IT solutions. The notion of buying the most appropriate and/or cheapest device for any given situation is attractive enough, but the challenges of integrating and managing equipment from numerous vendors often erase the savings customers initially enjoy. Despite these challenges, enterprises continue to work with multiple vendors, hoping that their IT departments and/or business consultants can sort out the mess.

Business continuance is increasing in importance

The enormous human toll of the September 11, 2001 terrorist attacks understandably overshadowed the severe data losses suffered by companies located in and near the World Trade Centers. While the business impact of 9/11 did not result in the immediate spate of new data protection and disaster tolerance installations that many predicted, we believe this acted as a wake-up call for many companies that had largely ignored this issue. The reason for this is

entirely practical. Over the past decade, increasing numbers of enterprises have migrated growing numbers of business processes to IT solutions and the Internet. As they moved online, enterprises enjoyed notable efficiency and financial benefits, but most also became sensitized to the dramatic costs of IT downtime. The events of 9/11 also resulted in numerous tangible examples that allowed enterprises to understand and quantify these solutions in entirely new ways.

End-to-end systems health is business-critical

Although we have focused on a few selected storage issues, we believe it is important to note and crucial to remember that business continuance also must take entire systems and business processes into account. While data storage solutions permeate enterprise networks and business solutions, vendors and customers are courting serious problems if they consider business continuity pain points as being in some way only storage-specific.

As enterprise systems grow in complexity, IT purchasers should weigh the effects that new hardware and software will have on end-to-end system health. In these circumstances, where businesses go for advice can potentially affect business continuance and system performance for years to come.

Business Continuance Measurements

How can enterprise storage customers determine the right approach to support their business continuance needs? First, it is critical for enterprises to establish practical measurements for four objectives they want these solutions to meet.

- ◆ **Time:** How quickly does disaster recovery need to occur? In short, it depends on the rate at which data is changed.
- ◆ **Point/Data:** What needs to be backed up?
- ◆ **Networks:** In case of an emergency, how long will it take to switch over networks? In “time is money” circumstances where infrastructure downtime translates directly into financial loss, speed is essential.
- ◆ **Geographic Considerations:** Of the many business repercussions of 9/11, geographic proximity offered some of the clearest and harshest lessons. Enterprises that want, need, and can afford the most robust solutions for protecting business information have engaged vendors including IBM and EMC for geographically dispersed disaster recovery solutions.

Comprehensive Continuance?

Along with these considerations, we believe the true effectiveness of business continuance solutions can be determined by how comprehensively they address overall IT infrastructure health. While some vendors and enterprise customers consider data protection and disaster recovery to be storage-focused, we believe that the migration of business functions and processes to IT solutions has shifted somewhat. While the efficiency of storage-based disaster recovery solutions is critical, it is not the end-all but simply an element of the greater whole of business continuity. In fact, it is arguable that storage solutions that are inadequately integrated with greater business infrastructures can hinder rather than complement business continuity.

What do enterprises need to remember as they consider business continuity issues? First, that no single solution or approach may satisfy all needs. Enterprise IT infrastructures are as varied as the companies they support, and even direct industry competitors who share

similar strategies and goals can and do deploy highly individualized IT solutions. This being the case, it is critical for enterprises to deploy the solutions that are most appropriate for their needs. For this reason, we believe that if properly designed, deployed, and managed, end-to-end solutions can offer the most effective means of integrating, leveraging, and protecting business critical IT resources. Additionally, end-to-end systems vendors are often able to deliver cost/efficiency advantages over storage-centric vendors, especially as infrastructures are upgraded and evolve over time.

Considering their critical role in business processes of every sort, storage solutions must be adequately designed for, integrated with, and deployed across ever larger IT systems. IBM, in particular, is approaching this challenge by offering end-to-end solutions based on integrated servers, storage, software, and service offerings that the company believes offer notable advantages for establishing and maintaining business IT health and efficiency. End-to-end vendors such as IBM suggest that a singular approach that considers enterprise IT environments holistically, centrally weighs deployment and integration decisions, and provides integrated solutions from the desktop to the datacenter is superior. Other vendors, including EMC and Hitachi Data Systems (HDS), follow approaches more specifically directed toward selected storage products and processes. EMC and HDS may argue that focusing on storage provides them with more specialized levels of expertise, and systems decisions can be adequately addressed by IT partners and business integrators.

Comparing IT Strategies: IBM and EMC

In both practical and strategic terms, how do end-to-end and storage-specific approaches to business continuity compare? For the sake of argument, we believe it is useful to consider similarities and differences between the approaches taken by IBM and EMC. While we do not pretend to offer detailed comparisons of the companies' storage product and service offerings, we believe reasonably accurate portraits can be painted in broad strokes.

Generally speaking, how do IBM and EMC compare? First, at a high level, the companies' storage offerings and strategies share obvious similarities. Both provide storage hardware aimed at filling a wide range of enterprise needs and business processes. Both deliver software solutions designed to address and automate complex storage functions and management processes for their own and other vendors' platforms, and both work closely with a variety of storage hardware and software partners. Both support global service organizations to enhance storage and business solutions, and also work closely with third party integrators. Both vocally support Open Standards efforts, but have pursued API swaps with other storage vendors to enhance their products' heterogeneous functionality.

However, while they appear to share many similar intents, IBM and EMC are pursuing their goals in notably different ways. While historically best known as a hardware vendor, IBM has evolved as a capable hardware, software and business services provider. EMC began as and remains a provider of enterprise and midrange disk storage hardware and storage software solutions. IBM's storage hardware and software offerings can stand alone, but are also critical elements of the company's larger end-to-end business solutions. EMC's products and services are storage-centric, though they perform essential roles in many vendors' system solutions. IBM pursues strategic relationships with a wide variety of business software developers. EMC's software partnerships are largely storage-focused. IBM's IGS organization offers heterogeneous storage services and support as one piece of its end-to-end business offerings. EMC's Global Services group focuses specifically on storage-related offerings and business processes.

Table 1: Comparative Strategies		
	IBM	EMC
Market Strategy	<ul style="list-style-type: none"> ◆End-to-end strategy leverages server, storage, and software assets to create service-based business offerings. ◆Recently consolidated its server and storage organizations to sharpen focus on integrated end-to-end solutions. 	<ul style="list-style-type: none"> ◆Focuses on a range of enterprise, mid-market and specialized storage products and services. ◆Recognized as a storage-centric vendor which partners to offer more complete enterprise solutions.
Storage Hardware	<ul style="list-style-type: none"> ◆Offers a variety of DAS, SAN & NAS products. ◆Focus on disk, tape, and optical technologies. ◆Leverages technologies from its server products for high end storage solutions. 	<ul style="list-style-type: none"> ◆Offers a variety of DAS, SAN & NAS products. ◆Focuses exclusively on disk-based technologies. ◆Purchases processor technologies from third parties.
Storage Software	<ul style="list-style-type: none"> ◆Offers a range of s/w solutions covering storage functionality and processes. ◆Other s/w efforts play a crucial role in business continuity applications, including host-based solutions. ◆Systems s/w bolsters the ability to deliver integrated end-to-end infrastructure solutions. 	<ul style="list-style-type: none"> ◆Offers a range of s/w solutions covering storage functionality and processes. ◆Provides centralized management console for multiple processes. ◆S/w integrated to support multi-vendor environments.
Partnerships	<ul style="list-style-type: none"> ◆Maintains partner relationships with major h/w vendors, and works closely with many storage ISVs. ◆Strategically stepped away from the business application field to focus on supporting relationships with ISVs globally. ◆Supports a worldwide network of 160+ Business Partner owned Total Storage Solution Centers. 	<ul style="list-style-type: none"> ◆Maintains partner relationships with major h/w vendors, and works closely with many storage ISVs. ◆Close partnership with Dell for mid-market offerings. ◆Supports independent and partner storage solution/training centers in the U.S., Europe, and Asia.
Service and Business Integration	<ul style="list-style-type: none"> ◆IBM Global Services delivers an array of consulting, integration and business services for heterogeneous storage environments. ◆Recently acquired PriceWaterhouseCooper, to enhance end-to-end business and technology solutions. 	<ul style="list-style-type: none"> ◆EMC Global Services delivers an array of consulting, business, and integration offerings for heterogeneous storage environments. ◆Partners with key systems vendors and business integrators to deliver end-to-end solutions.
Open Standards	<ul style="list-style-type: none"> ◆Supports Open Standards efforts including CIM model and Storage Management Initiative (AKA BlueFin) proposed by SNIA. ◆IBM Data Content Manager is hardware independent. ◆Has made storage API trades with other vendors . ◆IBM has licensed its PPRC and XRC Remote Copy to other vendors. ◆IBM belongs to the Storage Performance Council. 	<ul style="list-style-type: none"> ◆Supports Open Standards efforts including CIM model and Storage Management Initiative (AKA BlueFin) proposed by SNIA. ◆EMC's Centera content management S/W works only on EMC hardware. ◆EMC has traded APIs with other vendors, but the WideSky initiative promotes the company's proprietary APIs. ◆EMC's SRDF is not currently available for licensing by other vendors. ◆EMC does not belong to the Storage Performance Council.

What Does It All Mean?

Expertise aside, from both practical and logical standpoints data storage does not stand alone, and cannot be separated from the network and systems management issues that underlie effective business continuance. IT specialization of most any kind can deliver tangible, measurable business benefits, but specialists by their nature tend to take a micro-cosmic view of the world. Successful infrastructure management often requires a more integrated, macrocosmic, end-to-end approach such as that taken by IBM. Such an approach can provide customers economic as well as practical benefits. Along with following a more holistic approach to designing, deploying, and managing enterprise IT infrastructures, IBM pursues joint product development projects that leverage corporate technology assets across multiple product divisions, and have the potential to enhance highly integrated customer solutions. Additionally, end-to-end systems vendors like IBM can offer clients “one-stop shopping” package pricing options that are difficult for specialists to match or beat.

While storage is simply one element of overall business continuity, we believe some solutions in IBM’s future roadmap are likely to enhance overall system management, performance, and stability. Products such as the highly dense “Intelligent Bricks” recently announced by IBM R&D are likely to continue the company’s (and the greater industry’s) efforts to squeeze increasing amounts of data into radically smaller spaces. IBM also continues to pursue its anticipated Storage Tank and Virtualization Engine solutions, which are designed to simplify and enhance data management, and are anticipated to be delivered sometime in 2003. Most interesting is the place storage occupies in IBM’s Autonomic and On Demand computing models. While automating and delivering data storage as part of a “utility” service model may seem obvious to many, we believe it could profoundly impact the concept and practice of business continuity.

It is our belief that while business continuity requires enterprise class data storage solutions, its effectiveness is dependent upon expertise across multiple areas including systems hardware, infrastructure software, IT services, and business integration. If solutions are well engineered, manufactured, and integrated, end-to-end systems vendors can deliver solutions with advantages that exceed storage-centric offerings. Overall, we believe that IBM’s experience and expertise, the scope of its end-to-end offerings, and its future product roadmap makes the company a natural candidate for customers seeking robust, dependable whole system solutions.