

# Magic Quadrant for Midrange Enterprise Disk Arrays

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Emerging companies continued to drive innovation, while established companies refreshed their offerings and revamped distribution channels to reduce cost and gain share. Changes in market shares highlight the importance of nonproduct selection criteria when choosing storage vendors.

## WHAT YOU NEED TO KNOW

In 2008, the midrange disk storage market continues to grow faster than the high-end disk array market in terms of revenue, units and terabytes shipped. Two emerging midrange disk storage system vendors went public in 2007, one was acquired, and others continued to grow their revenue. The increasing credibility of midrange disk storage system vendors in the marketplace is a direct consequence of their installed bases and revenue growth, the innovation they bring to the market and the positive customer references they can deliver in competitive bid situations.

Some established midrange disk storage system vendors are catching up in innovation, while others continue to focus on creating solutions with tighter integration with applications. Thus, vendors focused on heterogeneous protocol support, disk-based backup/restore solutions and tight integration with strategically important independent software vendors (ISVs), such as Microsoft (Exchange, SQL and SharePoint), Oracle, SAP and VMware.

Budget constraints and the growing importance of “green IT infrastructures” have made disk-storage-system-based thin provisioning, quality of service (QOS) and data deduplication (particularly in archiving solutions) “must have” features in next-generation midrange disk storage systems. The expectation that new features such as these will dramatically improve the total cost of ownership (TCO) of next-generation disk storage makes it more imperative than ever that users plan on disk storage system service lives of no more than three to four years.

## MAGIC QUADRANT

This Magic Quadrant represents the current and probable relative strengths of vendors in the midrange disk array market at a moment in time by using a combination of product and nonproduct criteria. It is not a direct measure of product attractiveness or a vendor’s support capabilities. It is reasonable to use a Magic Quadrant to ease concerns about a company’s long-term viability or evaluate a vendor’s ability to implement its product development, marketing, service/support capabilities and sales strategies. However, using it to justify vendor or product selection is not an appropriate use of a Magic Quadrant. This said, Magic

Quadrants are good for highlighting key vendors in a market and helping IT personnel to select a shortlist of vendors to evaluate. It is fine to buy from vendors that are not in the Leaders quadrant. In fact, depending on the situation, Gartner will recommend including one or more of the storage vendors that fall outside the Leaders quadrant to be included on an end user's evaluation shortlist to gain access to innovative features or to address a particular storage infrastructure requirement. Moreover, Gartner readers should not compare the placement of vendors from previous midrange disk array Magic Quadrants to this update. The market is changing, and vendors continue to evolve their product offerings.

The criteria used to evaluate a vendor and position it on the Magic Quadrant are identified and weighted in the Evaluation Criteria section. Gartner's assessments take into account the vendor's current product offering and overall strategies as well as their future initiatives and product road maps. We also factor in how well vendors are driving market changes or at least adapting to changing market requirements.

### Market Overview

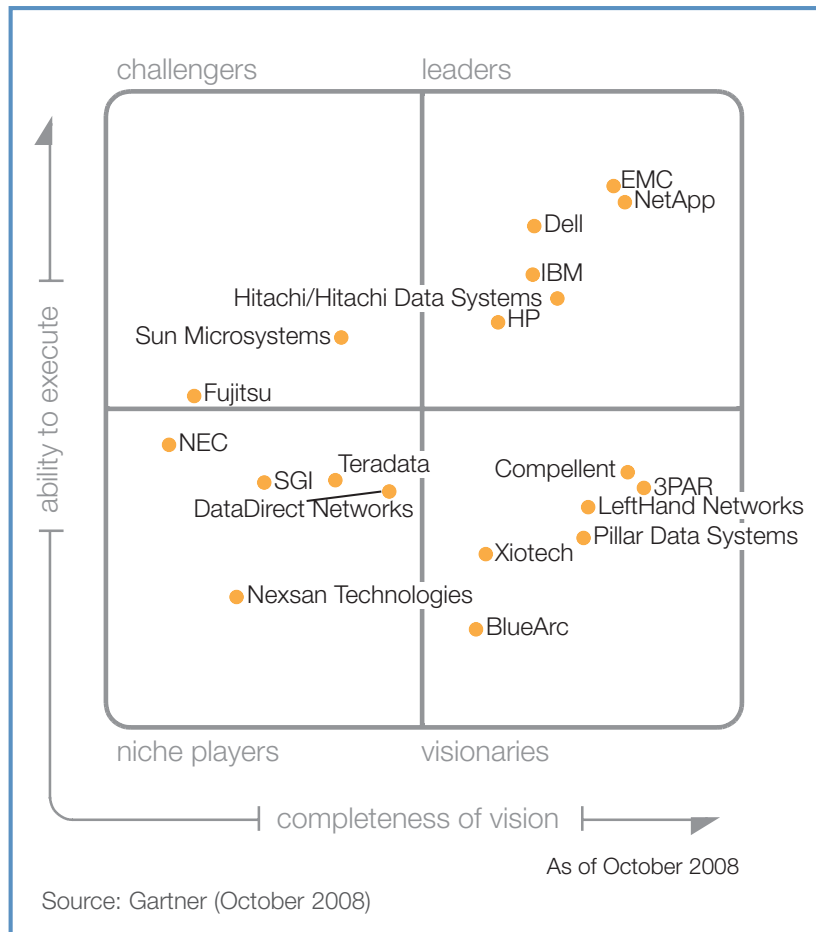
Users without a need for mainframe connectivity can choose from a variety of vendors' midrange disk array offerings. Many of the midrange disk array vendors support multiple block-access protocols, including Fibre Channel (FC) and Internet Small Computer System Interface (iSCSI) on the same platform. Some vendors also offer integrated Common Internet File System and Network File System file-access protocol options.

### Market Definition/Description

Gartner defines midrange disk array products as external controller-based redundant array of independent disks (RAID) that meet the following criteria:

- Use a dual-controller or cluster architecture
- Support Unix, Linux, Windows and NetWare server operating environments

**Figure 1. Magic Quadrant for Midrange Disk Arrays, 2008**



- Offer no mainframe support
- Have an average selling price of more than \$24,999

### Inclusion and Exclusion Criteria

To be included in this Magic Quadrant, a vendor must meet the following criteria:

- The vendor must have midrange disk array storage systems commercially available and have active references that are using them in production scenarios.

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- The vendor must generate at least \$25 million in annual midrange disk array hardware revenue.
- The vendor must actively market its branded midrange disk array products in at least two major regions (for example, North America and Europe, the Middle East and Africa [EMEA], or Japan and Asia/Pacific).
- The vendor must sell its branded midrange disk array products to user organizations via its direct sales force or through a reseller partnership sales channel.

Vendors offering midrange disk arrays that meet Gartner's requirements for this Magic Quadrant are listed in alphabetical order:

- 3PAR – InServ Storage Servers
- BlueArc – Titan
- Compellent – Storage Center
- DataDirect Networks – Silicon Storage Appliance (S2A)
- Dell – Dell/EMC CLARiiON CX series and Dell/EqualLogic PS5000 series
- EMC – CLARiiON CX series and Celerra
- Fujitsu – Eternus 4000
- Hitachi/Hitachi Data Systems – Adaptable Modular Storage (AMS) and Workgroup Modular Storage (WMS)
- HP – StorageWorks Enterprise Virtual Array (EVA) series and larger Modular Smart Array (MSA) series
- IBM – SystemStorage DS4000 series, DS5000 series, N series and XIV
- LeftHand Networks – NSM series
- NEC – D3 and D8 series
- NetApp – FAS series
- Nexsan Technologies – SATABeast, SATABeast Xi, DataBeast
- Pillar Data Systems – Axiom
- SGI – InfiniteStorage
- Sun Microsystems – Sun StorageTek 6000 series
- Teradata – 6000 series
- Xiotech – Magnitude 3D series and Emprise series

LSI Logic is not included in the Magic Quadrant because it does not have a direct sales channel or brand equity in the midrange disk array market. However, its OEM relationships with IBM, SGI, Sun and Teradata explain the commonality of features and functions of these companies' midrange offerings and highlight the importance of nonproduct criteria when positioning vendors in the Magic Quadrant.

#### Added

NEC was added.

#### Dropped

Dot Hill's go-to-market strategy has evolved to selling enabling storage system technology to other companies that add value to

**Table 1. Ability to Execute Evaluation Criteria**

Evaluation Criteria	Weighting
Product/Service	high
Overall Viability (Business Unit, Financial, Strategy, Organization)	high
Sales Execution/Pricing	high
Market Responsiveness and Track Record	high
Marketing Execution	high
Customer Experience	high
Operations	standard
Source: Gartner	

the base product and take the enhanced product to market under a non-Dot Hill brand. For example, the underlying technology for HP's new MSA2000 series is provided by Dot Hill.

EqualLogic was acquired by Dell and is now reflected in this Magic Quadrant under the Dell brand.

Intransa does not meet the minimum annual revenue requirement.

## Evaluation Criteria

### Ability to Execute

The ability to execute axis highlights the change in vendor positioning directly attributable to vendor actions. While important,

**Table 2. Completeness of Vision Evaluation Criteria**

Evaluation Criteria	Weighting
Market Understanding	standard
Marketing Strategy	high
Sales Strategy	high
Offering (Product) Strategy	high
Business Model	high
Vertical/Industry Strategy	standard
Innovation	high
Geographic Strategy	standard
Source: Gartner	

the product attribute is just one of the seven attributes evaluated by Gartner to determine a vendor's placement with respect to execution on the y-axis of the Magic Quadrant. The criteria weights used for this analysis are unchanged from the 2H07 version of this Magic Quadrant.

### Completeness of Vision

Completeness of vision focuses on potential. A vendor with average vision will anticipate and respond to change by accurately perceiving market trends and exploiting technology. However, a vendor with superior vision can anticipate, direct and initiate market trends. The weightings for these criteria are unchanged from Gartner's 2H07 Magic Quadrant.

### Leaders

Vendors in the Leaders quadrant have the highest scores for their ability to execute and completeness of vision. A midrange disk array storage vendor in the Leaders quadrant has the market share, credibility, and marketing and sales capabilities needed to drive the acceptance of new technologies. They demonstrate a clear understanding of market needs; they are innovators and thought leaders; and, they have well-articulated plans that customers and prospects can use when designing their storage infrastructures and strategies. In addition, they have a presence in the five major geographical regions, consistent financial performance, and broad platform support.

### Challengers

A vendor in the Challengers quadrant participates in the broad general-purpose midrange disk array market, has a competitive product portfolio, and a substantial number of installations, but has not yet demonstrated the ability to drive technical innovation while maintaining backward compatibility with its installed base or the ability to influence the market in the same way as vendors in the Leaders quadrant.

### Visionaries

A midrange disk array storage vendor in the Visionaries quadrant delivers innovative products that address operationally or financially important end-user problems at a broad scale, but has not demonstrated the ability to capture market share or sustainable profitability. Visionary vendors are frequently privately held companies and acquisition targets for larger, established companies. The likelihood of acquisition often reduces the risks associated with installing their systems. Two of the companies in the Visionaries quadrant – 3PAR and Compellent – are now publicly held companies. On 1 October 2008, HP acquired LeftHand Networks.

### Niche Players

Vendors in the Niche Players quadrant are often narrowly focused on specific market or vertical segments such as data warehousing, high-performance computing (HPC), low-cost disk-based data retention and other areas that are generally underpenetrated by the larger midrange disk array vendors. This quadrant may also include vendors that are still ramping up their overall midrange disk array go-to-market efforts and have yet to develop the vision or the execution to break out of the Niche Players quadrant.

## Vendor Strengths and Cautions

### 3PAR

#### Strengths

- 3PAR has built strong sales momentum and a loyal customer base. Sales revenue is growing at multiple times the overall midrange disk array market, driven in part by sales transactions that are significantly larger than the average midrange transaction and a healthy distribution between new and repeat business.
- Nimbleness in 3PAR's marketing, sales and development has enabled it to respond rapidly to emerging market needs; for example, early adoption of green messaging, support of VMware Site Recovery Manager, logical partitioning and fat-to-thin logical volume conversion.
- InServ Storage Server scalability differentiates it from dual-controller midrange storage systems and enables it to compete against high-end storage arrays in many situations using its lower acquisition costs, simplified management, back-end storage virtualization, thin provisioning, QOS and modular packaging as competitive advantages.

#### Cautions

- Midrange and high-end storage vendors are narrowing InServ Storage Server scalability and feature advantages. A number of emerging midrange storage vendors have achieved functional parity with 3PAR, and a number of high-end storage vendors have narrowed the functional gap with 3PAR by introducing thin-provisioning and QOS features that move pages or logical volumes between high-performance and high-capacity disks into their systems.
- Continued improvements in traditional dual-controller midrange storage systems and the growing credibility of emerging storage companies are making the overall midrange marketplace a much more competitive environment.
- InServ Storage Server does not have native network-attached storage (NAS) support; hence its NAS solutions are not as tightly integrated as unified storage systems offering block and NAS functionality.

### BlueArc

#### Strengths

- BlueArc offers a high-performance unified storage product with concurrent NAS and iSCSI connectivity, targeting applications that require high bandwidth and/or random input/outputs (I/Os). It has achieved some success in a few vertical industries, such as Web-based services and government, with about 300 customers and 800 system deployments, based on Gartner estimates.
- Its Titan products have an optimized hardware architecture, a scalable file system, as well as well-rounded, robust enterprise features.
- Hitachi/Hitachi Data Systems offers BlueArc products as high-performance network-attached storage (H-NAS) via its OEM relationship.

### Cautions

- After filing Securities and Exchange Commission (SEC S-1) pre-initial public offering (IPO) form in 2007, BlueArc has been quiet about its revenue growth, casting some uncertainty regarding the company's financials. Meanwhile, Hitachi/Hitachi Data Systems' sales of H-NAS has been flat in 1H08 compared with the same period in 2007, according to Gartner estimates.
- Most of BlueArc business is generated from the NAS side, not the iSCSI side.
- BlueArc has not improved its brand awareness in 2008.

### Compellent

#### Strengths

- Compellent added new features to optimize performance, such as Thin Import for higher storage utilization after migration and Fast Track for dynamic disk optimization, and variable block sizes for application optimization. Its Enterprise Manager provides simplified storage area network (SAN) management, automated chargeback and savings report.
- Reporting 88% revenue growth in 1H08 and a milestone of over 1,000 customers with about 70% of its customers using Storage Center to support virtual server environments, Compellent continues its successful market penetration.
- Compellent has developed an efficient partner portal and strong channel support. The company won the 2008 Microsoft Partner of the Year award.

#### Cautions

- Being a small storage company relatively new to the market, Compellent still lacks a long-enough track record and a wide range of ISV partners that can add value onto its platform.
- Although Compellent claims that it has unified storage for both block and file access, its file access is through a NAS gateway based on Windows Storage Server.
- Compellent is still mainly a U.S. company with limited penetration and brand awareness in international markets.

### DataDirect Networks

#### Strengths

- DataDirect Networks is well-positioned in the entertainment, Internet media, surveillance and HPC vertical markets. These market segments are relatively immune to downturns in the economy.
- DataDirect Networks reports that it is profitable, growing revenue faster than the midrange storage market, and seeing its investments in marketing, channels; and development increasing the ratio of new to repeat business. It has strong channel and OEM relationships with Bull, Cray, Dell, IBM and Sony

- The S2A storage system is tailored to the needs of DataDirect Network's target markets. More specifically, it optimizes throughput (MB/sec), error checking read and write operations, and offers dense packaging.

#### Cautions

- Competition from established storage vendors developing or acquiring their own high-bandwidth storage solutions is growing.
- The worldwide economic slowdown that may be occurring is occurring at the same time that DataDirect Network is attempting to expand its operations in EMEA and Asia/Pacific.
- The S2A lacks many of the controller-based software features needed to compete effectively in the general-purpose storage market; among the more important missing features are snapshots, remote copy and thin provisioning.

### Dell

#### Strengths

- Dell was the third-largest worldwide midrange block disk array vendor in revenue market share for the period of 3Q07 through 2Q08. The newly acquired EqualLogic has provided Dell with innovative storage technology, as well as the leading position in the iSCSI SAN market with a 34% revenue market share in 1H08. The EqualLogic business grew more than 70% in 1H08, representing almost 16% of Dell's total midrange disk storage revenue.
- Dell is reaching out to the distribution channels to broaden its market beyond its server installed base by offering more-aggressive pricing. It has added storage specialists and increased its investment in professional storage services.
- Its EqualLogic series is among the easiest to install in the industry and offers automatic load balancing among multiple nodes. Dell continues the all-inclusive pricing model to drive the affordability of storage for small and midsize businesses (SMBs). New enhancements in 2008 include application-aware data protection support for Microsoft Exchange, SQL, SharePoint and Virtual Servers, as well as VMware Site Recovery Manager.

#### Cautions

- Dell/EMC-branded storage declined almost 7% in 1H08, partly because of customers waiting for the summer launch of CX4 series. It is likely, but not conclusive at this point, that it was also impacted by EqualLogic storage.
- Dell will face increased iSCSI competition, especially from HP, which announced its pending acquisition of LeftHand Networks. Dell offers five iSCSI platforms with some overlapping markets. This could be confusing for potential customers.
- Although Dell was able to keep 50% of the EqualLogic business through the channels, it has lost some previous EqualLogic channel partners and will have to continue its efforts to gain channel's trust and avoid conflicts.

## EMC

### Strengths

- EMC continues to be the largest midrange disk storage vendor in terms of revenue. Annual midrange revenue from 3Q07 through 2Q08 grew 17% annually, or almost 6% faster than the midrange market.
- EMC's marketing and sales have the critical mass, expertise and budget needed to influence the market. EMC's marketing team is effective in positioning products and crafting messages that minimize product shortcomings and resonate with customers and prospects. Indirect channels are well-managed; direct-sales is aggressive; and market coverage is broad.
- Relative to competitors' dual-controller midrange systems, the new CX4 series offers more scalability and a flash memory solid-state disk (SSD) option. CX4 to CX3 model-to-model comparisons show the CX4 models delivering approximately twice the performance of their CX3 predecessors. Additional CX4 to CX3 product differentiation is provided via thin provisioning, green features and more host connectivity options.

### Cautions

- CX4 architectural enhancements have not yet fully addressed the operational advantages of a virtualized back end, eliminated the need to reserve or preprovision capacity for snapshots, increased the maximum number of snapshots per logical volume high enough to make it a nonissue operationally, or provided QOS features that include back-end disks. Furthermore SSD pricing may limit its market appeal, and scalability to 960 back-end disks is unlikely to be a factor in most competitive situations.
- EMC's CLARiiON and Celerra performance and TCO claims lack the transparency and credibility that come with independent verification or participation in widely used standard benchmarks such as the Storage Performance Council (SPC) benchmarks.
- The EMC Celerra NS-series multiprotocol implementation is not seamless. The NS-series uses Celerra provisioning, data services and management software for file and iSCSI protocols, but uses CLARiiON provisioning, data services and management software for the FC protocol.

## Fujitsu

### Strengths

- The Eternus 4000 is a well-designed and stable midrange disk array storage platform. Controller-based data encryption and key management, Level 3 Intelligent Power Management, RAID 6, and multiprotocol iSCSI and FC block-access host connectivity are standard capabilities.

- Efforts by the Fujitsu regional subsidiaries to gain a foothold in the worldwide midrange disk array market are backed by a secure, well-financed parent company with a proven engineering heritage that views the midrange disk array market as a growth opportunity reducing vendor viability risk.
- Fujitsu leverages its established server support escalation procedures and infrastructure to support Eternus 4000 installations. It can package server, infrastructure software, service offerings and financing with Eternus 4000 bids to enhance their financial attractiveness.

### Cautions

- Product development is controlled by management located in Japan, which may hamper timely introduction of important differentiating features such as thin provisioning, writable snapshots, subvolume QOS, data reduction techniques and iSCSI boot from SAN functionality for the large and highly competitive North American and EMEA markets.
- Outside of Japan, establishing a sustainable trusted storage advisor status continues to be a work in progress. Even though EMEA-based Fujitsu Siemens will sell the Eternus disk arrays directly to and support Fujitsu global customers, the fact that Fujitsu Siemens sources its FibreCat midrange disk array from a competing supplier further impedes Fujitsu's ability to gain a broad foothold in the growing EMEA market.
- Fujitsu's go-to-market strategy focuses on platform technology to the detriment of integrated ISV solutions.

## Hitachi/Hitachi Data Systems

### Strengths

- Hitachi/Hitachi Data Systems grew its midrange revenue about 6% from 3Q07 through 2Q08. This was driven by investments in marketing, sales, and its Certified Solution Provider Program, which helps indirect channels productize the delivery of services. Other factors contributing to this growth are Hitachi's reputation for building reliable systems, and Hitachi/Hitachi Data Systems' increasing willingness to compete on price.
- The new AMS 2000 midrange series implements a symmetric active/active controller design and shares a common management suite and APIs where there is functional overlap with Hitachi's high-end storage systems. This common heritage has also led to high-end availability and cache management features being migrated into Hitachi/Hitachi Data Systems' midrange systems, including things such as error correction code checking and cache partitioning features.
- Hitachi/Hitachi Data Systems is expanding its product and services portfolios to make it a more attractive supplier in complex heterogeneous environments. This includes more-comprehensive support of VMware and Microsoft environments and the repackaging of its management tools.

### Cautions

- The tight correlation between increased investments in marketing and sales and increased midrange sales revenue confirms that Hitachi/Hitachi Data Systems is still underinvested in sales and marketing relative to its investments in midrange development.
- In client surveys, Hitachi/Hitachi Data Systems is not seen as a leader in delivering value, ease of use, innovation or services, but many within the context of customer satisfaction have commented on its reliability.
- While Hitachi/Hitachi Data Systems has promised thin provisioning in 2009 for its AMS 2000 series, it will still take three to six months of use in the marketplace before it can be considered ready for mission-critical deployments, and other important features, such as QOS features that include transparently moving data between high-performance and high-capacity disks, are still missing.

## HP

### Strengths

- With more than 50,000 units installed worldwide, the EVA has successfully stood the test of time since its introduction in October 2001. Its back-end disk virtualization feature and ease-of-use characteristics remain the EVA's strongest value propositions. While yet to close, HP has acquired LeftHand Networks, which strengthens its midrange disk array portfolio in the growing iSCSI market.
- Leveraging its partnerships with large application providers, HP has strengthened its EVA offering by releasing integrated solutions for Microsoft Exchange Server 2007, Microsoft SQL Server, Oracle E-Business Suites, Oracle JD Edwards EnterpriseOne, and SAP ERP under the EVA Solution Blocks go-to-market program.
- The new MSA2000 series addresses the technological shortcomings of its predecessor models, bringing the MSA to parity with most competitive systems in the lower end of the midrange disk array market.

### Cautions

- Lack of capacity scalability hampers the EVA's competitive attractiveness in the higher ranges of the midrange disk array market.
- Dynamic Capacity Management falls short of the flexible functionality provided by thin provisioning.
- The EVA series is overdue for a major refresh. HP needs to address the lack of thin provisioning and scalability to keep pace with competing midrange disk arrays.

## IBM

### Strengths

- IBM is a global company with a large presence in the professional services, outsourcing, and financing markets and vertical-market expertise.
- IBM's OEM relationships and acquisitions are keeping it competitive in the midrange marketplace.
- The new XIV is a scale-out storage system with an innovative architecture and a rich but incomplete feature set that already includes a virtualized back end, thin provisioning, read/write mountable snaps, and the promise of very high availability.

### Cautions

- IBM has a large product portfolio of midrange disk array products offering diverse sets of value-propositions. Designing, deploying and managing a storage infrastructure that leverages this choice into an optimal infrastructure requires mastery of multiple provisioning, data services, management methodologies and diagnostic tools, and highly trained sales channels that can help users precisely map IBM's midrange offerings against user needs.
- With the exception of the XIV, IBM's ability to respond to changing midrange storage market conditions and competitors' announcements is limited by its OEMs' abilities to respond.
- IBM's efforts at creating synergies in messages and marketing programs at the corporate level often result in messages and marketing programs that are suboptimal for individual markets. Similar efforts to leverage the broader portfolio of products in the development process often handicap the disk array products due to a lack of disk storage technology focus.

## LeftHand Networks

### Strengths

- HP on 1 October 2008 announced its intention to acquire LeftHand Networks for \$360 million in cash, thereby removing any questions about company viability.
- LeftHand Networks has a large and growing installed base that in 4Q08 includes more than 3,000 customers and 11,000 installations. The high double-digit percentage of revenue growth attributable to repeat business suggests a high level of customer satisfaction within the LeftHand Networks installed base.
- The SAN/IQ software implements a scale-out iSCSI disk storage infrastructure that can include a mix of physical and virtual servers and includes such high-value-added functionality as thin provisioning, snapshots and asynchronous remote copy.

### Cautions

- HP's acquisition of LeftHand Networks will create management, development, marketing and sales instabilities that will take time to resolve. During this transition period, maintaining sales momentum could be a challenge.
- Dell's success with EqualLogic will put further pressure on HP as it assimilates LeftHand Networks.
- Retaining LeftHand Networks channel partners that compete against HP in the server, storage or professional services marketplaces could prove difficult.

## NetApp

### Strengths

- NetApp is the world's fourth-largest midrange disk storage vendor in terms of revenue from 3Q07 through 2Q08 with a healthy 11.2% growth rate and continues to lead the IP storage market with a 30% revenue market share in 1H08.
- In 2008, NetApp introduced storage management products for virtual server environments and continues to promote its strong data protection suite and deduplication technology. The value proposition with its truly unified storage architecture with the same storage management software remains unchallenged in the industry among other leading storage vendors.
- To increase its sales, the company officially changed its name from Network Appliance to NetApp in March 2008, launched a worldwide marketing campaign to raise brand awareness, and hired an additional 20% quota-carrying salespeople.

### Cautions

- NetApp's growth continues to derive mainly from key accounts in North America and Western Europe. Its brand awareness, channel penetration and support infrastructure in the fast-growing Brazil, Russia, India and China (BRIC) countries still remain weak compared with top storage vendors.
- NetApp innovation pace slowed down somewhat in 2008 with no major new features added, while its major competitors are catching up and its small competitors deepen their market penetration. The major enhancement of DataONTAP GX is further delayed to 2009. The company has been weak in positioning itself in the long-term archiving market.
- NetApp's pricing of its robust solutions often comes at a premium.

## Nexsan Technologies

### Strengths

- Featuring dense packaging of low-cost, large-capacity Serial Advanced Technology Attachment (SATA) disk drives, Nexsan pioneered the development of midrange disk array storage solutions for long-term secondary storage applications. Augmented by AutoMAID technology, Nexsan midrange disk array products continue to drive watt per terabyte utilization downward, addressing the rising cost of power in the data center.

- To address a broader and more-general-purpose market, Nexsan introduced in July 2008 the DataBeast disk array storage product featuring thin provisioning, space-efficient snapshots and asynchronous/synchronous replication functionality.
- Addressing IT storage infrastructure budget constraints, Nexsan employs an all-in-one value-pricing model that includes controller-based snapshot and remote replication software in the base price of its DataBeast offering.

### Cautions

- Except for AutoMAID and its value-pricing model, there is little to differentiate Nexsan's midrange disk array offerings from that provided by some of the larger, better-positioned disk array vendors.
- Based on data sourced from Nexsan's Form S1 filing, Nexsan continues to show a net loss for its most recent publicly disclosed full fiscal year of operation.
- When configured separately from DataBeast, the SATABeast and SASBoy disk arrays lack snapshot and remote replication functionality limiting their applicability to applications that do not require these capabilities.

## NEC

### Strengths

- The NEC D-Series midrange disk storage systems represent solid, and in some respects, advanced design. Featuring active/active RAID controllers, space-efficient writable snapshots, virtual storage partitioning, dynamic pools, extended data integrity and NEC's patented Phoenix RAID rebuild avoidance technology, the D-Series can scale up to 1,536 disk drives.
- To further enhance the D-Series functionality, NEC is scheduled to deliver support for thin provisioning, 1 Gbps iSCSI host connectivity and iSCSI boot from SAN in November 2008.
- NEC's initiatives to establish a competitive presence in the open-system disk-based storage market outside of Japan are backed by a very large parent company with a storage technology DNA that spans almost 50 years.

### Cautions

- On a global basis, NEC is the 11th-largest external controller-based disk storage vendor. However, outside of its home country, Japan, NEC continues to work toward gaining broader awareness and acceptance as a trusted supplier of disk-based storage solutions.
- NEC's service and support infrastructure and escalation procedures for the D-Series in the North America region are still evolving; however, our reference checks indicate satisfaction with customer service.
- Integration with ISV solutions is rather immature at this stage.

## Pillar Data Systems

### Strengths

- Pillar Data Systems deliver a unified storage NAS/SAN architecture with scalable storage controllers, high-capacity utilization and an easy user interface. Its initial innovation lies in the QOS features from protocol queuing to disk layout.
- In 2008, Pillar focused on performance enhancement for Oracle applications and tighter integration with VMware and launched mission-critical storage systems with five nines availability guarantees and high performance in terms of I/Os per second. It also brought thin provisioning to the SAN side.
- Customers have enjoyed Pillar's aggressive pricing and the knowledge base of Pillar's services and support staff.

### Cautions

- While Pillar has enhanced its application support for Oracle and VMware in 2008, it has made limited progress in supporting Microsoft applications.
- Pillar Data is offering some key technologies such as remote replication and deduplication through their partners. However, customers often prefer native replication and deduplication.
- Some customers expressed concerns about limited training sessions and services options.

## SGI

### Strengths

- Focusing on I/O performance and bandwidth throughput, the SGI InfiniteStorage midrange disk array storage systems in association with its shared file system (CFXS) and data life cycle management software are well-suited for HPC, high-performance business applications and infrastructures requiring scalable low-cost disk storage.
- Representing a time-proven architecture, the InfiniteStorage 4000 series features InfiniBand and 4 Gbps FC host interfaces, RAID 6, up to 32GB of cache per controller, and can scale to 448TB of raw capacity with linear input/output operations per second (IOPS) scalability up to 448 FC or SATA disk drives. The InfiniteStorage 6700 midrange disk storage system targets throughput-intensive applications, while the InfiniteStorage 10000 is suitable for applications requiring high-density online storage.
- Sized to appropriately support its business plan, SGI's professional and customer service organizations possess strong competencies in deploying and supporting complex storage infrastructures for the vertical markets SGI targets for penetration.

### Cautions

- SGI continues to work toward establishing financial success, and until it is able to achieve sustainable profitability, it represents a business risk that buyers of midrange disk array storage systems must take into consideration.
- SGI's midrange disk array storage success is closely tied to its server initiatives, and it is unlikely that you will find InfiniteStorage systems deployed in a heterogeneous server infrastructure that is not predominately composed of SGI servers.
- The InfiniteStorage midrange disk storage systems lack certain features and functions, including thin provisioning, 1 Gbps iSCSI support, controller-based data reduction functionality and writable snapshots, which narrows their applicability in the general-purpose midrange disk array market.

## Sun Microsystems

### Strengths

- The Sun StorageTek 6000 series midrange disk array storage systems represent market-tested technology, featuring 4 Gbps end-to-end FC performance, scalability up to 224 disk drives, and the ability to mix FC and SATA disk drives within the same disk tray. Users report satisfaction with these systems' performance, reliability and ease of use.
- Sun has implemented a pricing strategy that favorably positions the Sun StorageTek 6000 series in the competitive landscape. The Sun StorageTek 6000 series is available as a Sun System Pack offering, which combines product and extended support services at a price that is less than purchasing them separately.
- The Sun Customer Loyalty and Investment Protection Program (CLIPP) is designed to protect its midrange disk array user base from competitive encroachment and to provide incentives for users to upgrade to the latest Sun StorageTek 6000 series technology. Claiming an average savings of 35%, CLIPP provides tray-level data-in-place migration and the transfer of premium features to the latest members of the Sun StorageTek 6000 family without having to pay an upgrade premium.

### Cautions

- Continuous changes in its field operations organizational structure and leadership have caused unnecessary concern among the Sun client base about Sun as its preferred provider of IT infrastructure solutions.
- The lack of support for iSCSI, writable snapshots, thin provisioning and intelligent power management functionality restricts the applicability of the Sun StorageTek 6000 series in the midrange disk array market. The absence of collaborative midrange disk array storage marketing programs supporting VMware and Microsoft Hyper-V environments hampers broader Sun StorageTek 6000-series deployments.
- Sun's highly visible promotion of its open-storage software strategy casts a shadow over its longer-term commitment to the Sun StorageTek 6000 series.

## Teradata

### Strengths

- Configured to support high-availability requirements and tuned to provide the best possible performance with the least number of disk drives for the workload generated by the Teradata system, the Teradata midrange disk array storage systems are an integral component of the Teradata Warehouse solution and are not sold as stand-alone storage devices.
- With the Teradata database software managing data placement in the storage system, Teradata solutions require relatively little storage management attention. As a result, customer complaints about pre- and postsales support are most rare.
- Teradata refreshes its midrange disk array storage systems every 12 to 18 months with the latest in CPU, disk drive and host interface technologies.

### Cautions

- Because Teradata bundles the midrange disk array storage system price within quotations for its Teradata Warehousing solution, it is difficult to determine if the client is getting a competitively priced midrange disk array system.
- Gartner research indicates that Teradata charges a 10% to 20% price premium over what an end user would pay for a comparably configured midrange disk array deployed in a general-purpose disk storage infrastructure.
- When configured with the midrange disk array, the Teradata Warehouse solution may conflict with an organization's approved list of disk array storage systems and may even result in a higher price.

## Xiotech

### Strengths

- The Intelligent Storage Element technology incorporated into the new Emprise series virtualizes back-end storage, reduces the impact of disk failures by varying of disk surfaces rather than the entire hard-disk drive, and reduces the number of disk-related frequency of repair activities by automatically repairing most disk failures without the need to remove the failed disk, which underpins the Emprise's five-year hardware warranty.
- The Emprise offers the same ease of installation and management that are responsible for Xiotech customer loyalty. It delivers more performance and throughput than its Magnitude 3D predecessor and is also backward-compatible with its predecessor.
- Xiotech reports revenue growth that is multiple times the midrange storage system market growth, and the new management team is investing in the marketing and sales resources needed to sell advanced technology into the midrange market at more than commodity pricing.

### Cautions

- Xiotech continues to lag behind competitors with respect to thin-provisioning functionality.
- Xiotech brand awareness appears to be lower than that of other emerging storage companies, which is due at least in part to channel limitations and Xiotech's focus on a limited number of vertical markets such as government agencies, education, finance, healthcare and application development.
- Sales revenue outside the U.S. is minimal, making Xiotech more vulnerable to downturns in the U.S. economy than many other competitors.

### Vendors Added or Dropped

We review and adjust our inclusion criteria for Magic Quadrants and MarketScopes as markets change. As a result of these adjustments, the mix of vendors in any Magic Quadrant or MarketScope may change over time. A vendor appearing in a Magic Quadrant or MarketScope one year and not the next does not necessarily indicate that we have changed our opinion of that vendor. This may be a reflection of a change in the market and, therefore, changed evaluation criteria, or a change of focus by a vendor.

#### Acronym Key and Glossary Terms

<b>AMS</b>	Adaptable Modular Storage
<b>API</b>	application programming interface
<b>CLIPP</b>	Customer Loyalty and Investment Protection Program
<b>DDN</b>	DataDirect Networks
<b>EMEA</b>	Europe, the Middle East and Africa
<b>EVA</b>	Enterprise Virtual Array
<b>FC</b>	Fibre Channel
<b>HPC</b>	high-performance computing
<b>H-NAS</b>	high-performance network-attached storage
<b>I/O</b>	input/output
<b>IOPS</b>	input/output operations per second
<b>IPO</b>	initial public offering
<b>IP</b>	Internet Protocol
<b>iSCSI</b>	Internet Small Computer System Interface
<b>ISV</b>	independent software vendor
<b>MAID</b>	massive array of idle disks
<b>MSA</b>	Modular Smart Array
<b>NAS</b>	network-attached storage
<b>NSM</b>	Network Storage Module
<b>QOS</b>	quality of service
<b>RAID</b>	redundant array of independent disks
<b>S2A</b>	Silicon Storage Appliance
<b>SAN</b>	storage area network
<b>SATA</b>	Serial Advanced Technology Attachment
<b>SEC</b>	Securities and Exchange Commission
<b>SMB</b>	small and midsize business
<b>SPC</b>	storage performance council
<b>SSD</b>	solid-state disk
<b>TCO</b>	total cost of ownership
<b>WMS</b>	Workgroup Modular Storage
<b>VAR</b>	value-added reseller

## Evaluation Criteria Definitions

### Ability to Execute

**Product/Service:** Core goods and services offered by the vendor that compete in/serve the defined market. This includes current product/service capabilities, quality, feature sets and skills, whether offered natively or through OEM agreements/partnerships as defined in the market definition and detailed in the subcriteria.

**Overall Viability (Business Unit, Financial, Strategy, Organization):** Viability includes an assessment of the overall organization's financial health, the financial and practical success of the business unit, and the likelihood of the individual business unit to continue investing in the product, to continue offering the product and to advance the state of the art within the organization's portfolio of products.

**Sales Execution/Pricing:** The vendor's capabilities in all pre-sales activities and the structure that supports them. This includes deal management, pricing and negotiation, pre-sales support and the overall effectiveness of the sales channel.

**Market Responsiveness and Track Record:** Ability to respond, change direction, be flexible and achieve competitive success as opportunities develop, competitors act, customer needs evolve and market dynamics change. This criterion also considers the vendor's history of responsiveness.

**Marketing Execution:** The clarity, quality, creativity and efficacy of programs designed to deliver the organization's message in order to influence the market, promote the brand and business, increase awareness of the products, and establish a positive identification with the product/brand and organization in the minds of buyers. This "mind share" can be driven by a combination of publicity, promotional, thought leadership, word-of-mouth and sales activities.

**Customer Experience:** Relationships, products and services/programs that enable clients to be successful with the products evaluated. Specifically, this includes the ways customers receive technical support or account support. This can also include ancillary tools, customer support programs (and the quality thereof), availability of user groups and service-level agreements.

**Operations:** The ability of the organization to meet its goals and commitments. Factors include the quality of the organizational structure including skills, experiences, programs, systems and other vehicles that enable the organization to operate effectively and efficiently on an ongoing basis.

### Completeness of Vision

**Market Understanding:** Ability of the vendor to understand buyers' wants and needs and to translate those into products and services. Vendors that show the highest degree of vision listen and understand buyers' wants and needs, and can shape or enhance those with their added vision.

**Marketing Strategy:** A clear, differentiated set of messages consistently communicated throughout the organization and externalized through the Web site, advertising, customer programs and positioning statements.

**Sales Strategy:** The strategy for selling product that uses the appropriate network of direct and indirect sales, marketing, service and communication affiliates that extend the scope and depth of market reach, skills, expertise, technologies, services and the customer base.

**Offering (Product) Strategy:** The vendor's approach to product development and delivery that emphasizes differentiation, functionality, methodology and feature set as they map to current and future requirements.

**Business Model:** The soundness and logic of the vendor's underlying business proposition.

**Vertical/Industry Strategy:** The vendor's strategy to direct resources, skills and offerings to meet the specific needs of individual market segments, including verticals.

**Innovation:** Direct, related, complementary and synergistic layouts of resources, expertise or capital for investment, consolidation, defensive or pre-emptive purposes.

**Geographic Strategy:** The vendor's strategy to direct resources, skills and offerings to meet the specific needs of geographies outside the "home" or native geography, either directly or through partners, channels and subsidiaries as appropriate for that geography and market.