# Magic Quadrant for Midrange Disk Arrays

**Even in a weak economy, midrange disk array revenue outshines other external controller-based disk storage segments. New product offerings incorporating advanced technology that reduce cost and improve utilization are helping some vendors gain share, but nonproduct attributes remain important.**

## WHAT YOU NEED TO KNOW

Sparked by technology innovation and the broad deployment of virtualized server infrastructures, the midrange disk array market produced better results in terms of vendor revenue and terabytes shipped than the other external controller-based disk storage segments. Despite a seriously weak global economy, midrange disk array vendor revenue declined only 3.7% over a 12-month period from July 2008 through June 2009, while high-end enterprise disk array vendor revenue dropped 11.3%.

The midrange disk array market is a fragmented market. Users have many alternative vendors from which to choose. While Gartner's quantitative research shows that the eight largest vendors represent 81% of midrange disk array market revenue, our end-user surveys and client inquiries indicate that IT personnel responsible for the storage infrastructure are increasingly willing to consider alternative vendors with midrange disk array products that might produce a better total cost of ownership (TCO) outcome, or more precisely meet service-level agreements (SLAs) associated with applications requiring extreme bandwidth performance or high-density disk storage. This said, Gartner does not expect a material change in market share between these two vendor segments during the next 12 months.

As users address the need to improve operational efficiencies within their storage infrastructure technologies such as unified storage architectures, thin provisioning, reservationless snap copies, automated quality of service (QoS) and data deduplication become attributes that play an important role in vendor selection. In addition to the above features, midrange disk array systems incorporating intelligent power management capabilities and high-density storage provide economical solutions that address the growing power and space dilemmas faced by many organizations.

The emergence of scale-out and dual-controller midrange disk arrays based on industry standard platforms gained positive market traction over the past 12 months. This developing trend is likely to shift expenditures from hardware to software over the coming months and years.

## MAGIC QUADRANT

This Magic Quadrant (see Figure 1) 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, vendor
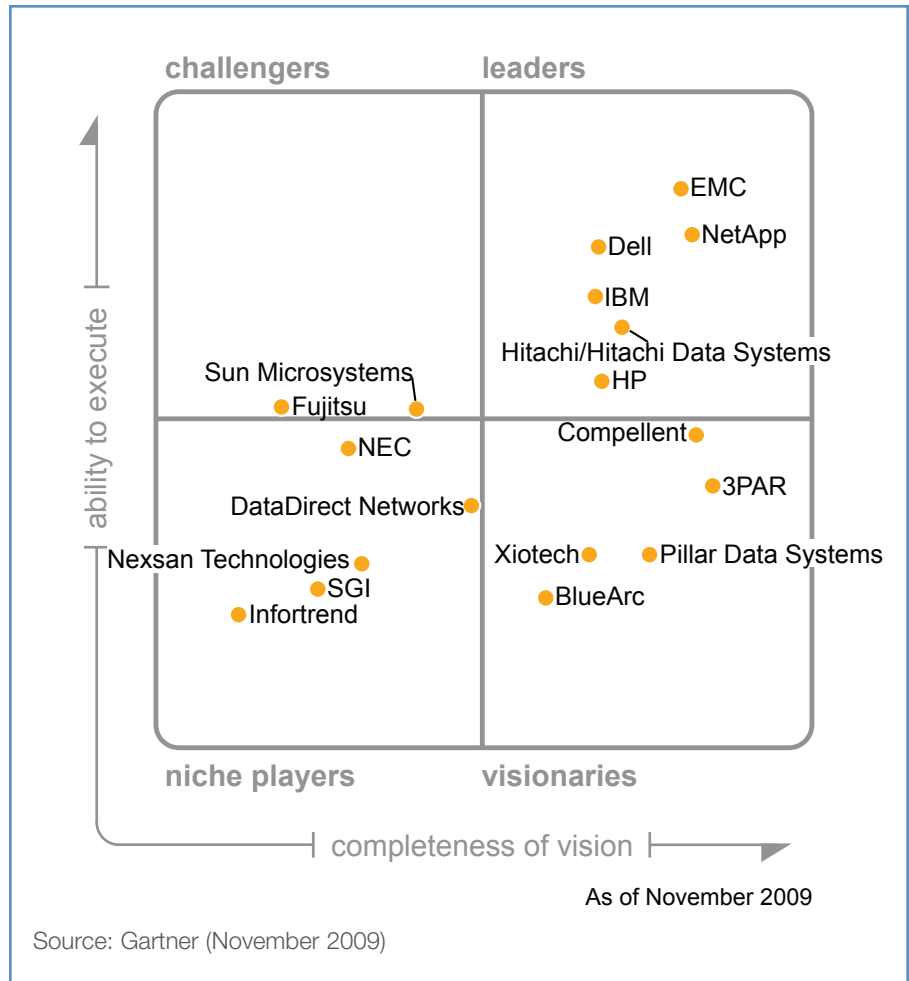
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viability or a vendor's support capabilities. It is reasonable to use a Magic Quadrant to ease concerns about a company's long-term viability or evaluate a vendor's ability to implement its product development, marketing and service/support capabilities 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 select a shortlist of vendors to evaluate. It is fine to buy from vendors that are not in the Leaders quadrant, particularly if your business needs require a specific feature set better provided by vendors in one of the other quadrants. 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 its future initiatives and product road maps. We also factor in how well vendors are driving market change 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 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 (CIFS) and Network File System (NFS) file-access protocol options.

**Figure 1. Magic Quadrant for Midrange Disk Arrays, 2009**



Source: Gartner (November 2009)

## 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

- Offer no mainframe support

- Have an average selling price of more than $24,999

- Support block-access protocol

## 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.

- 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 and Mercury

- Compellent – Storage Center

- DataDirect Networks – S2A9900, S2A9700, S2A6620 and Storage Fusion Architecture (SFA) 10000

- Dell – Dell/EMC CLARiiON CX series and Dell/EqualLogic series

- EMC – CLARiiON CX series and Celerra

- Fujitsu – ETERNUS DX400 (formerly branded as ETERNUS4000)

- Hitachi/Hitachi Data Systems – Adaptable Modular Storage (AMS) 2000

- HP StorageWorks – Enterprise Virtual Array (EVA) series, HP/LeftHand SAN Solutions and larger Modular Smart Array (MSA) 2000 series

- IBM – System Storage DS5000 series, DS4000 series, N series and XIV

- Infortrend – Enterprise Scalable Virtualized Architecture (ESVA) Storage Array

- NEC – D3 and D8 series

- NetApp – FAS series

- Nexsan Technologies – DATABeast, iSeries, SATABeast, SATABeast Xi

- Pillar Data Systems – Axiom

- SGI – InfiniteStorage

- Sun Microsystems – Sun Storage 6000 series

- Xiotech – Emprise 5000/7000 and Magnitude 3D 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 and Sun 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

Infortrend was added.

### Dropped

LeftHand Networks was acquired by HP and is now reflected in this Magic Quadrant under the HP brand.

Teradata was deleted because it sells midrange disk array storage systems only as a component of its data warehousing solution.

## Evaluation Criteria

### Ability to Execute

The Ability to Execute axis highlights the change in vendor positioning directly attributable to vendor actions. While important, 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 2008 version of this Magic Quadrant.

Table 1. Ability to Execute Evaluation Criteria

| Evaluation Criteria | Weighting |
|---|---|
| Product/Service | high |
| Overall Viability (Business Unit, Financial, Strategy, Organization) | standard |
| Sales Execution/Pricing | standard |
| Market Responsiveness and Track Record | high |
| Marketing Execution | no rating |
| Customer Experience | standard |
| Operations | no rating |
| Source: Gartner (November 2009) | |

Table 2. Completeness of Vision Evaluation Criteria

| Evaluation Criteria | Weighting |
|---|---|
| Market Understanding | high |
| Marketing Strategy | no rating |
| Sales Strategy | no rating |
| Offering (Product) Strategy | high |
| Business Model | no rating |
| Vertical/Industry Strategy | standard |
| Innovation | high |
| Geographic Strategy | low |
| Source: Gartner (November 2009) | |

## 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. While important, the product attribute is just one of the eight attributes evaluated by Gartner to determine a vendor's placement with respect to vision on the x-axis of the Magic Quadrant. The weightings for these criteria are unchanged from Gartner's 2008 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 it does not currently demonstrate 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 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 publicly held companies.

## 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 a loyal customer base, has presence and visibility in the cloud hosting market, and is expanding its direct and indirect sales channels. In a down economy, 3PAR reported that it grew revenue 35.8% over a 12-month period from July 2008 through June 2009. Programs to increase the new sales to repeat-business sales revenue ratio have the potential to accelerate revenue as the economy improves and to drive down overall sales expense.

- Development is delivering innovation, and 3PAR messaging is effective in highlighting that innovation's impact on operations and TCO. For example 3PAR's messaging on getting thin and staying thin and its obtaining Symantec API support of this new functionality increases its value, while building on earlier marketing programs that focused on green messaging and VMware support.

- InServ Storage Server functional, performance/throughput and management enhancements are keeping it competitive. The introduction of the entry-level F-Class expands 3PAR's target market in the midrange market, and its high-end T-Class keeps it competitive against high-end storage systems in which there is no requirement for mainframe support. The introduction of three-site remote copy replication and persistent cache support further expands 3PAR's high-end target market by making the T-Class more attractive in mission-critical environments.

**Cautions**

- Midrange technology refreshes from more-established storage vendors that improve scalability and performance and architectural enhancements, such as thin provisioning and active/active controller designs that automatically load balance between controllers and scale-out architectures, are putting competitive pressure on 3PAR from the bottom, while aggressively priced smaller high-end storage systems are applying pressure from the top. Add the growing credibility of emerging storage companies and the midrange marketplace is becoming even more competitive and unforgiving.

- Established storage vendors, through acquisitions and internal development efforts, are beginning to aggressively sell their scale-out solutions. This competition can elongate 3PAR's sales cycle and lower average sales prices.

- 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/output, especially in vertical industries such as oil/gas exploration, media/entertainment, Internet services and life sciences. In 2009, it launched the high-performance midrange product Mercury at more affordable price points to broaden its market appeal.

- Both its Titan and Mercury products have an optimized hardware architecture and a scalable file system, as well as well-rounded, reliable enterprise features, such as scalable snapshots, thin provisioning and in-system policy-based storage tiering. In 2009, BlueArc added external cross-volume links to bring third-party storage systems under the management of BlueArc file system for lower-tier, deduplicated storage with its partner Ocarina Networks, providing customers with the ability to define their deduplication policies and offering transparency to users.

- BlueArc has recruited additional channel partners and added SGI as an OEM partner, in addition to Hitachi.

**Cautions**

- Hitachi's OEM relationship has not been as successful as it could be, relative to Hitachi's brand recognition and large installed base. Therefore, Hitachi has not contributed to BlueArc's financial health in a major way.

- BlueArc's penetration in the iSCSI market is low, with no customers using its systems as pure iSCSI storage area network (SAN) arrays. Due to budget constraints as a small vendor, its products lack tight integration with applications from Microsoft, Oracle and VMware.

- Like other small vendors, BlueArc suffers from the lack of brand awareness, weak channel penetration and robust technical support for some geographies.

## Compellent
**Strengths**

- Compellent continues to grow its market penetration, reporting 55.7% revenue growth over the 12-month period from July 2008 through June 2009. It has developed an increasing number of loyal customers and channel partners who are enthusiastic about Compellent's storage systems.

- The Compellent Storage Center is known for its innovative automated data migration at the sub-logical unit number (LUN)/volume level among different tiers of storage (with different RAID levels) within its system, as well as other advanced features, including thin provisioning, scalable snapshots and near-continuous data protection. In 2009, it added solid-state drives (SSDs) as another tier with automatic data migration, as well as Serial Attached SCSI (SAS) drive support. The company also introduced Virtual Ports technology, which reduces SAN infrastructure cost and offers automatic path load balancing, and Portable Volume, which is a low-cost, convenient approach to jump-start remote replication. Integrated with Microsoft PowerShell, Compellent reduces administrators' time to provision a large number of volumes to servers.

- Compellent's systems are sold 100% through indirect channels, with no concerns for channel conflicts. The company has developed an efficient partner portal and strong channel support with effective marketing programs. It has also focused much effort on deepening its relationships with some key application partners, such as Microsoft, Oracle and VMware, offering timely support for the virtualized environment.

**Cautions**

- The release of Live Volume (a business continuity solution), one of the key new features presented in its May 2009 customer and channel conference, has been delayed and will not ship until late 2009.

- Compellent customers expressed the need for a truly unified storage system with a native file system, beyond what it offers today via a NAS gateway based on Windows Storage Server. Its storage arrays lacks RAID 6 for dual disk failure protection, but this feature will ship in late 2009.

- Although Compellent has many certifications with major technology providers, such as Symantec, Oracle and SAP, being a small storage company, Compellent still lacks the clout to develop deeper partnerships with these large software companies. The company has limited penetration and brand awareness in international markets.

## DataDirect Networks

### Strengths

- DataDirect Networks is a well-known brand in the entertainment, Internet media, surveillance and HPC vertical markets. Its storage systems are known for their high-capacity scalability and density for unstructured data storage and high sequential bandwidth to support various scalable file systems. In 2009, the company introduced its Storage Fusion Architecture (SFA) with SSDs for high input/output operations per second in addition to high bandwidth, broadening its storage appeal to data-intensive environments. Its new Web Object Scaler is one of the few storage products designed for cloud-computing infrastructure.

- The company has been focusing on its core business in the most-relevant vertical industries. It has strong channel partners with application focus and OEM relationships with IBM, Dell, Cray, Bull, SGI and Sony.

- The company has trained its sales engineers to understand third-party scalable file systems and tape backup technologies to present solution sales.

### Cautions

- DataDirect Networks' storage systems continue to lack many features for the general-purpose storage market, including snapshots, remote copy, thin provisioning and iSCSI target. Therefore, despite its innovative designs, the company does not compete against general-purpose midrange storage systems in the broad market, and it lacks relevance in the fast-growing virtual server environment.

- The company is facing increased competition from large storage vendors, which are either developing or acquiring their own high-bandwidth storage solutions.

- Being a private company, DataDirect Networks lacks financial transparency.

## Dell

### Strengths

- As the second-largest midrange disk array storage provider in the world, Dell sources and resells the market-leading midrange CLARiiON CX series from EMC. Dell's CX sales constituted about 25% of EMC's CLARiiON revenue in the third quarter of 2009. The OEM relationship has been extended through 2013.

- Against the unfavorable economic backdrop, Dell continues its success with its EqualLogic iSCSI SAN arrays, which almost doubled in revenue in the first half of 2009 compared with the same period in 2008. EqualLogic accounted for 35% of Dell's midrange disk storage revenue and 48% of midrange iSCSI SAN market share in 1H09. Dell has successfully positioned its EqualLogic storage for the virtual server environment with all-inclusive pricing and more than doubled its channel partners in the past year.

- The EqualLogic series' major appeal includes simplicity, good performance for the majority of workloads, and reduced storage management tasks (due to a good level of automation). New enhancements in 2009 include SSD support, a higher-capacity array for lower-tier storage or backup, RAID 6 support across all arrays, centralized monitoring and reporting, and snapshot integration with Microsoft Hyper-V and VMware vSphere for fast restore of virtual servers.

### Cautions

- According to Gartner research, the co-branded Dell/EMC CX series declined by more than 25% in revenue over the 12-month period from July 2008 through June 2009. This was much faster than EMC's decline in its CLARiiON revenue. The faster decline by Dell was mainly caused by the deliberate shift in the midrange storage product mix toward the EqualLogic line and Dell-branded CX business that meets gross margin objectives.

- Dell offers five iSCSI platforms with some overlapping markets. This could be confusing for potential customers.

- Although Dell has customers who have deployed over a petabyte of EqualLogic's storage using multiple groups, EqualLogic's scale-out design supports a maximum of 16 nodes (or "members" in Dell's language) per group. Each group has an iSCSI connection limit of 2,048. For those who want to manage more than a thousand virtual servers with one large storage group, they will need to carefully plan the server and storage architecture, including iSCSI connections.

## EMC

### Strengths

- EMC is the largest midrange disk storage vendor in terms of revenue. Indirect channels are well-managed; direct sales are appropriately aggressive; and market coverage is broad. Teamed with effective service and support, this translates into a strong image in the marketplace.

- EMC keeps its CLARiiON CX-based systems competitive with ongoing functional enhancements and periodic system refreshes. Marketing and sales have the critical mass, expertise and budget needed to understand and influence the market. Consequently, EMC has been able to develop good partnerships with infrastructure and software vendors.

- The CX4 provides the CLARiiON installed base with a smooth upgrade path, supports SSDs, is now offering a thin provisioning option, and is virtualization-aware at the storage layer. When packaged with the Celerra data movers, it becomes an NS series that can support FC, iSCSI, CIFS, NFS and file-level data deduplication (aka single-instance store) and data compression.

**Cautions**

- CX4 scalability advantages are offset by the risk of a controller failure reducing system performance and throughput by something less than 50% and the lack of an active/active controller design that automatically load balances between controllers. Other operational concerns include less-sophisticated management tools than those offered by emerging storage companies, the need to reserve or preprovision capacity for snapshots, and a limited number of snapshots per logical volume.

- The EMC Celerra NS series multiprotocol implementation uses different management tools and interfaces depending on the protocol. The NS series uses Celerra provisioning, data services and management software for file and iSCSI protocols and CLARiiON management software to support the FC protocol.

- With Dell accounting for approximately 25% of EMC's total CX series revenue, Dell's shift in emphasis from the CX series onto its EqualLogic PS series is a significant revenue threat that has seen Dell/EMC-branded CLARiiON CX series revenue decline 26% during the 12-month time period from July 2008 through June 2009.

## Fujitsu

**Strengths**

- Featuring advanced capabilities, such as thin provisioning, LUN migration, SSD, drive spin down, Eco-mode, storage-based data encryption and support for multiprotocol block access, the ETERNUS DX400 (formerly branded as ETERNUS4000) is a suitable midrange disk array for a wide range of applications requiring premium performance and availability.

- Firmly established in Japan and in EMEA, and growing steadily in the Americas and Asia/Pacific regions, Fujitsu is able to provide quality presale, postsale, and maintenance service and support for clients requiring midrange disk array storage.

- Consolidating worldwide product management, product marketing and product offerings under the ETERNUS brand has the potential to heighten awareness of Fujitsu as a supplier of midrange disk array storage systems.

**Cautions**

- Fujitsu's marketing programs historically tend to focus on Japan and EMEA to the detriment of creating more awareness and demand in the large Americas and the broader Asia/Pacific regions.

- The independent Fujitsu sales organization and Fujitsu storage product management goals are not in complete alignment, resulting in conflict with the desired focus on the ETERNUS brand. The Fujitsu EMEA region sales organization may sell non-ETERNUS storage to satisfy a client's midrange disk array requirement.

- Outside of Japan and EMEA, Fujitsu's awareness as a trusted provider of midrange disk array storage solutions does not measure up to its awareness in the server market.

## Hitachi/Hitachi Data Systems

**Strengths**

- Despite a down economy, Gartner's research shows that Hitachi/Hitachi Data Systems grew its midrange disk array storage revenue by 5.4% over a 12-month period from July 2008 through June 2009 for a market share increase of 0.6 percentage points. Factors contributing to this growth include the market embracing the AMS 2000 symmetric active/active controller design that automatically load balances workload between controllers; Hitachi Data Systems' greater willingness to compete on price; and a focus on growing midrange revenue supported by ongoing investments in marketing and sales.

- The combination of thin provisioning (aka dynamic provisioning), SAS disks, high-density 48-disk expansion trays, and symmetric active/active controller design makes the AMS 2000 series a competitive offering. AMS 2000 usability is further enhanced by its sharing of a common management suite and APIs with Universal Storage Platform (USP) Vs, where there is functional overlap. This makes the AMS 2000 series more attractive in accounts that have USP Vs installed, expands its software ecosystem, and lowers training and support costs.

- Hitachi/Hitachi Data Systems is investing development, marketing/sales and support resources to penetrate targeted markets. Examples include building Network Equipment Building Systems (NEBS)-compliant versions of its AMS 2000 series and its investments in supporting server virtualization, Microsoft, Oracle and Sun software offerings. Hitachi/Hitachi Data Systems is also investing in its support infrastructure to improve customer self-service capabilities and overall customer satisfaction at all support levels.

- Hitachi/Hitachi Data Systems is expanding its product and services portfolios to make it a more attractive supplier in complex heterogeneous environments. It is also expanding its use of third-party hardware maintenance providers to increase its geographical coverage. This includes more-comprehensive support of VMware and Microsoft environments and the repackaging and enhancement 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.

- Even with a rich feature set that includes thin provisioning, a symmetric active/active controller design that improves staff productivity and a reputation for building reliable systems, Hitachi/Hitachi Data Systems is not perceived of as a leader in delivering value, ease of use, innovation or services. Improving this image will require significant improvements in marketing and management tools.

- Hitachi/Hitachi Data Systems needs to improve its competitiveness in the unified storage market segment by investing more sales and marketing resources in this area and making the integration of its AMS 2000 and NAS technology seamless.

## HP

### Strengths

- The acquisition of LeftHand Networks enhances HP's midrange disk array portfolio from both a vision perspective and an execution perspective.

- HP continues to strengthen the EVA as a midrange disk array offering by developing integrated application aware solutions for Oracle, SAP, Microsoft Exchange, Microsoft SQL and VMware.

- The HP Converged Infrastructure strategy enables the StorageWorks division to leverage other elements of the HP portfolio, including software, servers, networking, financing and professional services to assist selling its midrange disk arrays.

### Cautions

- Capacity scalability, limited snapshots per volume, the lack of thin provisioning, automated QoS and intelligent power management hinder EVA's competitiveness in the midrange disk array market.

- Positioning of the HP EVA and the HP LeftHand P4000 SAN for the smaller-enterprise market results in considerable overlap, which may lead to confusion about which product represents the best fit for a customer's needs.

- HP's global integrated Enterprise Storage and Servers end-to-end external marketing campaigns are not positioning HP as a technology thought or market leader in the midrange disk array market.

## IBM

### Strengths

- IBM, independent of market share gains or losses in the midrange storage market, is a global company with a large presence in the professional services, outsourcing and financing markets, with vertical-market expertise and the ability to create bundled business solutions.

- IBM's OEM relationships and acquisitions are keeping it competitive in the midrange disk array storage marketplace and helping it keep account control, which is critical to established vendors with substantial market share.

- The XIV has gained market mind share, attributable in some measure to its very fast (30 minutes or less) rebuild of failed 1TB Serial Advanced Technology Attachment (SATA) disks onto spare system capacity; it is also meeting end-user expectations and is competing successfully against large midrange and small high-end storage systems where mainframe support is not required. IBM has delivered on its promise of nondisruptive microcode updates and has introduced lower-cost smaller six- and nine-node XIV systems to expand its target market.

### Cautions

- IBM's portfolio of midrange disk systems does not share a common heritage or a common look and management feel. Hence, selling this portfolio of products requires highly trained sales channels that can help users map each system's value propositions against user needs. Layering a common look and feel onto four architecturally dissimilar systems, only two of which are IBM-owned, in TotalStorage Productivity Center adds potential complexity, cost and scheduling delays into development efforts.

- IBM has not yet increased the maximum number of nodes in an XIV, nor has it shipped a parity RAID implementation that would make the system more attractive for data mining and archiving needs. The attractiveness of the IBM DS5000/4000 series and the N series is dependent on its OEM suppliers' developing the necessary features and functions in a timely manner to keep these midrange disk array systems competitive.

- 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 and the storage market in particular. 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.

## Infortrend

**Strengths**

- The Infortrend ESVA midrange disk array offers dual active/active controllers, virtualized back-end disk storage, thin provisioning, distributed load balancing, 8 Gbps FC or 1 Gbps iSCSI host interfaces, and multipathing support, making it a viable solution for applications requiring scale in performance and capacity. Data services include snapshots, volume mirroring, synchronous and asynchronous replication, and remote replication.

- Founded in 1993, Infortrend, a company with a worldwide presence, has established a successful technology innovation and financial track record providing external controller-based RAID technology to OEMs, storage integrators, distributors and value-added resellers (VARs).

- Infortrend is listed on the Taiwan stock exchange, enabling interested parties to have access to its financial performance.

**Cautions**

- While the ESVA's specifications are impressive, these systems have yet to be fully field-validated.

- Infortrend has to prove itself to be a dependable supplier of midrange disk array systems and as a provider of enterprise-class client service and support in order for the ESVA to achieve market success.

- Infortrend's marketing programs tend to focus on ESVA's technical features rather than on integration with leading ISV solutions such as VMware, Microsoft Hyper-V, Microsoft SQL, Microsoft Exchange and Oracle which may hinder competitiveness in a solutions oriented market.

## NetApp

**Strengths**

- NetApp's midrange block and unified storage hardware revenue increased by 5.3% in the 12-month period from July 2008 through June 2009. The company grew its revenue market share slightly. Brand awareness has also increased.

- The value proposition with its truly unified FAS storage architecture with the same storage management software remains unmatched in the industry among other leading storage vendors. The company reported that its deduplication technology has been deployed by more than 7,000 customers on more than 37,000 systems.

- NetApp continues to deepen its integration with major application providers, including Symantec, Oracle, SAP and Microsoft, as well as virtualization platform vendors, such as VMware, so that the applications and virtual infrastructures can better use its controller-based deduplication, data protection and space-efficient cloning functions. As a result, it was named Microsoft 2009 Storage Solutions Partner of the Year.

**Cautions**

- According to Gartner market statistics estimates, NetApp has not gained market share in the fast-growing iSCSI SAN market. Its FC SAN revenue market share registered 3.1% for the four quarters ending 30 June 2009.

- The scale-out cluster mode for its FAS series supports only NAS protocols today, and back-end load balancing is not automated.

- The company has been weak in positioning itself in the long-term archiving market, as well as in the cloud-computing arena.

## Nexsan Technologies

**Strengths**

- Beyond the mid-2008 release of DATABeast, which supports block and file host interface protocols, storage pooling, thin provisioning, space-efficient snapshots, and asynchronous/synchronous replication functionality, Nexsan has expanded its midrange disk storage system portfolio to include the Nexsan iSeries. These new offerings enable Nexsan to compete in the broader general-purpose midrange disk array markets, including the fast-growing iSCSI SAN infrastructure and data deduplication segments.

- Nexsan employs an all-in-one hardware/software pricing strategy, simplifying the contractual arrangements with its VARs and end users. This pricing model permits users to scale capacity without scaling associated software costs to support thin provisioning and local/remote replication.

- Providing basic RAID-level data protection, Nexsan's SASBeast and SATABeast products are designed to provide power, space and cost-efficiencies. These platforms are suitable for applications such as digital video surveillance, HPC, media, disk-based backup and general-purpose storage in which local and/or remote replication functionality is not required.

**Cautions**

- Nexsan's system-level product – DATABeast – comes with a standard warranty of only one year. Adding the cost of maintenance support for Years 2 and 3 to match competitive standard warranties reduces its TCO attractiveness.

- Nexsan updated its Form S1 with the U.S. Securities and Exchange Commission in May 2009, which provides audited fiscal-year financial results for 2006 through 2008 inclusive and for the six-month period from July 2008 through December 2008. Financial results beyond the above time periods lack transparency.

- Product marketing programs are inwardly focused and lack integration with leading applications, such as VMware, Microsoft Hyper-V, Microsoft SQL, Microsoft Exchange and Oracle, thereby hindering its broad awareness as a trusted provider of midrange disk array storage solutions.

## NEC

### Strengths

- The NEC D series is a functionally competitive midrange disk storage offering that can scale up and scale out; keeps write operations active following a controller electronics failures; and supports space-efficient writable snapshots, thin provisioning, 1 Gbps iSCSI host connectivity and iSCSI boot from SAN, virtual storage partitioning, dynamic pools, and extended data integrity.

- In a down economy, NEC is competing aggressively on price to gain a presence outside of Japan. It is also offering a satisfaction guarantee that enables prospects to try NEC technology without risk.

- NEC is a very large technology company spending more than $3 billion a year on R&D. It is No. 13 in the worldwide midrange market; it has a reputation for building reliable and innovative storage systems; and it has been in the storage business for more than 50 years.

### Cautions

- NEC's recent reorganization has led to significant changes in the senior management in the Americas IT Platform and Solutions Group, the organization responsible for the marketing and sales of the D series. The new management team is comfortable with the NEC culture, but it will take six to 12 months before the impact of these changes becomes visible in the form of increased revenue, sales momentum and market visibility.

- NEC brand awareness and sales channel bandwidth in the midrange disk storage market are low outside of Japan. Addressing these prerequisites to market success will take time as well as money.

- ISV support remains limited, and service and support capabilities are still maturing even as client feedback indicates good satisfaction with the D series due in large measure to the robustness of that series.

## Pillar Data Systems

### Strengths

- Pillar Data Systems delivers unified NAS/SAN storage systems that can scale from two to eight controllers with large aggregate cache and shared disk pool. The systems can set automated, granular policies against various components for a few major applications, such as Oracle, Microsoft Exchange and VMware, based on workload characteristics. They can also automatically allocate and migrate data to the appropriate storage media (such as SSDs, FC drives and SATA drives) to increase storage efficiency and cost-effectiveness.

- In 2009, Pillar Data Systems made improvement in supporting Microsoft applications, such as Exchange and SQL, as well as adding application-aware profiles for Citrix XenServer.

- Pillar Data Systems has revamped its channel programs and shown some early success when the company reported record channel bookings in 2Q09.

### Cautions

- Pillar Data Systems is a private company, and as such there is a lack of financial transparency. As a result, company viability has been an issue with users.

- Some important features, such as remote replication and deduplication, are offered through third-party technologies, not built in natively on the company's storage platform. Pillar Data Systems' storage does not support RAID 6 or dual-parity data protection.

- Brand awareness continues to be an issue for Pillar Data Systems. The company needs to address it with aggressive and innovative external marketing programs.

## SGI

### Strengths

- The breadth of SGI's InfiniteStorage RAID product portfolio covers the full price range of the midrange disk array market, enabling SGI to satisfy most storage requirements associated with its target customers.

- Emphasizing extreme performance and capacity scalability, the purpose-built InfiniteStorage 15000 and 6120 are appropriately suited for high-bandwidth applications, such as rich media, HPC, video surveillance, seismic imaging for the energy industry and satellite communications.

- The InfiniteStorage 4000 series is a dual active/active modular architecture with a proven track record of performance and reliability. Augmented by its internally developed shared file system (CFXS) and data migration facility software, SGI's InfiniteStorage 4000 series disk arrays are well-suited for multiplatform, high-performance data sharing and tiered storage applications.

### Cautions

- The absence of sustained profitability represents a business risk that users should consider when evaluating an SGI InfiniteStorage RAID solution.

- SGI has yet to make the case that the InfiniteStorage RAID product portfolio represents a strategic asset in which it will invest the necessary marketing, sales, service and support resources required to achieve the status of a trusted provider of midrange disk array storage.

- Lack of integration with leading applications, such as VMware, Microsoft Hyper-V, Oracle, Microsoft SQL, Microsoft Exchange and SAP, narrows market attractiveness of SGI's InfiniteStorage RAID product portfolio.

## Sun Microsystems

### Strengths

• The midrange disk array systems within the Sun Storage 6000 series are dual-controller architecture platforms with an established record of performance and reliability.

• Despite the uncertainty associated with Oracle's acquisition of Sun Microsystems, users report that Sun continues to meet service and support SLAs associated with the Sun Storage 6000 series of midrange disk array systems.

• Sun enhances the affordability of its Sun Storage 6000 series of midrange disk arrays by integrating at no cost the Common Array Manager and key data services, including Sun StorageTek Data Snapshot, Sun StorageTek Data Volume Copy, Sun StorageTek Data Replicator and Sun StorageTek Storage Domains.

### Cautions

• The extended period of time for Oracle's acquisition of Sun Microsystems to be approved by the European Commission, the European Union's executive and regulatory branch, is forestalling Oracle's ability to publicly state its plans for the Sun Storage 6000 series of midrange disk array systems, causing current users and potential customers to bear the risk of the unknown.

• Lacking support for thin provisioning, SSD, writable snapshots, iSCSI and intelligent power management functionality places the Sun Storage 6000 series at a competitive disadvantage relative to midrange disk array systems that have incorporated these features.

• Assuming Oracle's acquisition of Sun Microsystems is approved by the European Commission, users should expect changes to the Sun Microsystems field operations organizational structure that supports the Sun Storage 6000 series of midrange disk arrays as Oracle strives to improve the efficiencies and profitability of this acquisition.

## Xiotech

### Strengths

• The Intelligent Storage Element (ISE) shipping in every Emprise system is now market-validated and delivering excellent robustness, ease of use and efficient capacity utilization. The five-year hardware warranty offered with all Emprise systems is a major advantage in organizations with particularly cumbersome or time-consuming RFP processes. ISE delivers these benefits by virtualizing the disks in its back-end sealed DataPacs and reconditioning disk surfaces that are marked as bad.

• The ICON Manager provides Emprise with ease of use, provisioning wizards and integration with VMware. The Emprise 7000 distributed cluster architecture enables users to survive site failures without using replication technologies by separating controller nodes and ISE modules/drive bays by up to FC distances.

• Despite a difficult economy, Xiotech reported year-over-year revenue growth of 8.7% and a growing pipeline.

### Cautions

• Xiotech is a privately held company, and users need to take into consideration the lack of financial transparency that this creates when evaluating Xiotech and the effectiveness of its new CEO and senior VP of Marketing.

• While Xiotech has recently expanded Intelligent Provisioning platform support to include VMware and various Linux implementations, it still does not support HP-UX, IBM AIX or Sun Solaris.

• Xiotech brand awareness is lower than that of other storage companies, and sales revenue outside the U.S. is minimal, which limits Xiotech's ability to benefit from upticks in economic activities around the world.

## 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

| | |
|---|---|
| **AMS** | Adaptable Modular Storage |
| **CIFS** | Common Internet File System |
| **EMEA** | Europe, the Middle East and Africa |
| **ESVA** | Enterprise Scalable Virtualized Architecture |
| **EVA** | Enterprise Virtual Array |
| **FC** | Fibre Channel |
| **HPC** | high-performance computing |
| **iSCSI** | Internet Small Computer System Interface |
| **ISE** | Intelligent Storage Element |
| **ISV** | independent software vendor |
| **LUN** | logical unit number |
| **MSA** | Modular Smart Array |
| **NAS** | network-attached storage |
| **NFS** | Network File System |
| **QoS** | quality of service |
| **RAID** | redundant array of independent disks |
| **SAN** | storage area network |
| **SAS** | Serial Attached SCSI |
| **SATA** | Serial Advanced Technology Attachment |
| **SFA** | Storage Fusion Architecture |
| **SLA** | service-level agreement |
| **SSD** | solid-state drive |
| **TCO** | total cost of ownership |
| **USP** | Universal Storage Platform |
| **VAR** | 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 that the individual business unit will continue investing in the product, will continue offering the product and will advance the state of the art within the organization's portfolio of products.

**Sales Execution/Pricing:** The vendor's capabilities in all presales activities and the structure that supports them. This includes deal management, pricing and negotiation, presales 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 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 initiatives, 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, service-level agreements and so on.

**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 to 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 products 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 sets 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 vertical markets.

**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.