

Magic Quadrant for General-Purpose Disk Arrays

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[VIEW SUMMARY](#)

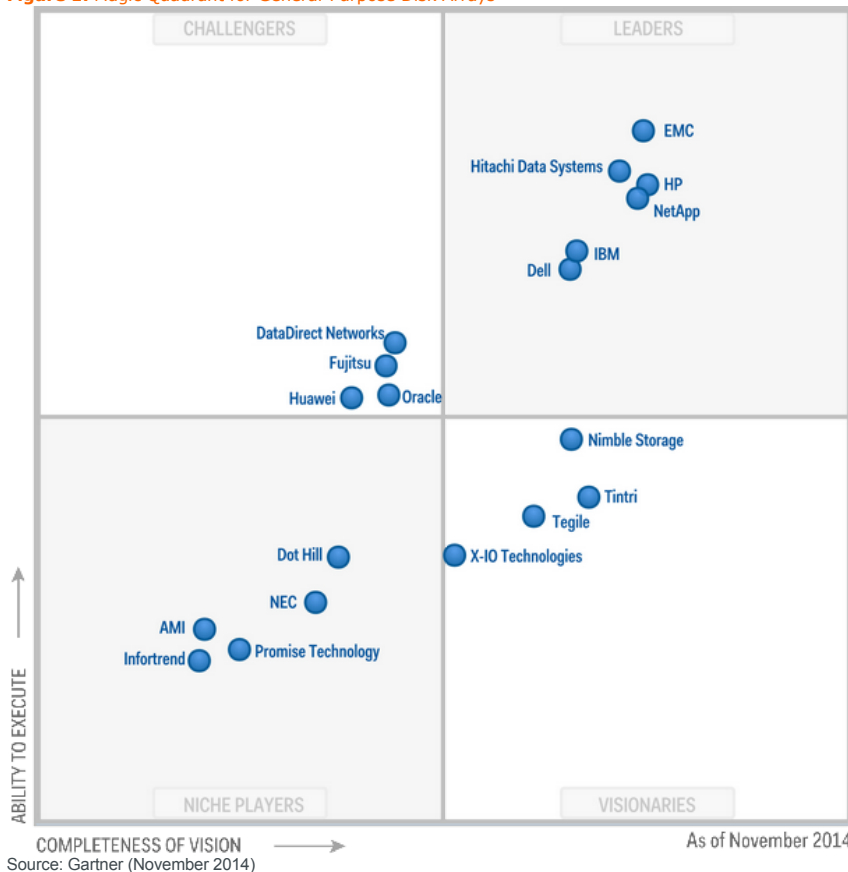
As new technologies gather momentum, I&O leaders must ensure that their infrastructure visions align with their current and potential suppliers' product strategies, and quantify suppliers' abilities to deliver on their promises. Here, we outline vendor strengths and weaknesses in this market.

Market Definition/Description

General-purpose disk storage systems are designed to address shared storage requirements within a single system that can support multiple virtual or physical servers, hosted virtual desktop (HVD) infrastructures, multiple databases and files. This market segment includes midrange, high-end and network-attached storage (NAS) systems, and hybrid arrays. Solid-state arrays (SSAs) are not included in this Magic Quadrant because Gartner has created an SSA Magic Quadrant that can provide better insights into this rapidly changing market.

Magic Quadrant

Figure 1. Magic Quadrant for General-Purpose Disk Arrays



Vendor Strengths and Cautions

AMI

American Megatrends Inc. (AMI) is a self-funded, privately held company with a 27-year history of bringing IT products to market. AMI is a leading provider of basic input/output system (BIOS) firmware, and remains well-known for its broadly distributed MegaRAID PC interface (PCI) host-based redundant array of independent disks (RAID) controllers. Building off its StorTrends 3400i success in 2013 and 2014, AMI released the more powerful StorTrends 3500i model, enabling it to expand its market reach to small or midsize business (SMB) and entry enterprise organizations. Featuring the 64-bit StorTrends iTX OS, the 3500i is a primary storage platform that can be deployed as a hybrid or all-flash storage

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EVALUATION CRITERIA DEFINITIONS

Ability to Execute

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

Overall Viability: 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/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 website, 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.

array suitable for supporting midtier mission-critical applications or as part of a tiered storage infrastructure. AMI's worldwide market traction is focused exclusively on a channel-centric, go-to-market model. While AMI will not release revenue performance associated with the StorTrends storage portfolio, it reports that it is profitable and cash-flow positive.

Strengths

AMI's value pricing model includes an all-inclusive hardware/software pricing structure, free installation services and free product training.

Featuring dual-controller active/active architecture and nondisruptive firmware upgrades, the StorTrends 3500i IP-SAN storage appliance supports auto failover/failback, a solid set of integrated data management service and storage efficiency software including deduplication, and compression data-reduction functions.

The StorTrends iDATA tool enables users to proactively analyze read/write data patterns to precisely determine the amount of solid-state drive (SSD) capacity needed to support active or hot data to optimize capital expenditure (capex) and performance: to improve disk utilization; and to decide whether or not to pin data to the SSD or HDD tier prior to committing to a specific SSD capacity acquisition.

Cautions

The StorTrends 3500i/3400i installed base is relatively small, particularly outside the U.S., which can potentially encumber responsive sales and service support for customers in remote and/or non-U.S. locations.

AMI has yet to certify vSphere 5.5 or implement vStorage APIs for Storage Awareness (VASA).

The StorTrends Quality of Service (QoS) function does not guarantee applications a specific level of input/output operations per second (IOPS) performance or support nondisruptive removal of capacity from autotiered pools.

DataDirect Networks

Building off its strong positions in the high-performance computing, genomics, manufacturing, entertainment and surveillance markets, DataDirect Networks (DDN) is now investing heavily in big data analytics and targeting large, high-profile enterprises, universities and research organizations with individual acquisitions and spend rates large enough to support DDN's investment in a technically competent direct sales force. With the announcements of the SFA12KX and the midrange SFA7700, DDN has extended its Storage Fusion Architecture (SFA) series performance upward and downward. These new models make it easier for users to take advantage of DDN's "in-storage processing" capability to analyze data where it's collected and to disperse SFA system deployments.

Storage Fusion Xcelerator (SFX) flash caching improves performance by caching hot data and enables users to tailor performance needs against budget constraints. DDN's GRIDScaler, EXAScaler and Web Object Scaler (WOS) offerings are tightly integrated with SFA block storage arrays to create synergies for DDN customers, while reducing DDN development costs and time to market. The SFA's dense packaging and cloud tiering further enhance DDN's appeal in large environments.

Strengths

DDN is a 16-year old, financially successful, privately held storage company that grew revenue in a difficult year, even as it attempts to penetrate new market segments.

DDN is highly differentiated, with its focus on high-performance, distributed workloads through an evolving portfolio that spans block, file and object storage products.

DDN build and microcode quality are competitive when compared with larger established vendors.

Cautions

DDN is now attracting the attention of large, established storage vendors and has experienced relatively recent changes in senior management that, when taken together, may threaten its ability to continue innovating.

DDN lacks tight integration with VMware and Hyper-V.

Some organizations remain reluctant to do business with privately held vendors that lack the financial transparency of publicly traded companies.

Dell

Dell is using the flexibility it now enjoys as a privately held company to reshape its storage go-to-market strategy and product portfolio. While the implications of Dell's privatization will not become fully visible for at least the next few years, early observations are mostly promising. Dell has kept its storage systems competitive with hardware redesigns that share Dell components between servers and Compellent and EqualLogic storage systems to gain economies of scale. Dell has also launched Fluid Cache for SAN, a server-side cache product that integrates with Compellent's Data Progression feature. Concerns about management turmoil and R&D investment cuts have so far proved unfounded, with R&D remaining essentially flat year over year. Whether this is enough to keep pace with other portfolio companies across all storage market segments remains to be seen. Dell's revised go-to-market strategy is placing heavy emphasis on indirect channels, storage economies and ease of use — end-user concerns that are growing in importance. Compellent sales are up on a revenue basis; EqualLogic sales are down on a revenue basis (despite an uptick in unit shipments); and while Fluid File System (FluidFS) revenue is growing, it is not yet growing fast enough to make Dell a major player in the midrange and enterprise NAS markets.

Strengths

Dell is an established portfolio company with a worldwide presence that has managed the transition from being a public to a privately held firm without damaging its image and with minimal disruption to its revenue, management ranks or development activities.

Tight integration between Fluid Cache for SAN and Compellent's Data Progression feature improves the performance and usable scalability of Compellent arrays.

Across the whole product line, Dell storage is competitive in "feeds and speeds" and competitively priced in the market, with customers having a positive disposition regarding its perpetual software licensing, which makes upgrades more cost-effective.

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.

Cautions

Dell lacks a high-end storage system and an all-flash array that supports in-line compression and deduplication; and while Compellent with the release of Storage Center 6.5 does offer post-ingest compression that is performance-neutral, the lack of deduplication limits Compellent's appeal in virtual desktop infrastructure (VDI) environments.

The inability to scale a Compellent storage array beyond two controllers, coupled with the lack of dynamic load balancing, limits its usable availability and performance relative to midrange arrays with four or more controllers.

Dell must still rationalize its storage and converged infrastructure offerings to simplify Dell storage deployments and management, and to improve R&D effectiveness.

Dot Hill

Dot Hill Systems is a publicly traded storage company that has grown its revenue by double digits from July 2013 through June 2014, despite a relative lack of brand awareness, revenue declines from long-term OEM customers and difficult economic conditions. This growth has been driven by the addition of new OEMs, development of Dot Hill's branded storage systems and the introduction of new products. The new AssuredSAN 4004 delivers more performance and throughput, and more functionality than its predecessor; and, with thin provisioning, autotiering, reservationless snapshots and asynchronous remote replication, is competitive by most measures. The new AssuredSAN Ultra48, a 2U high-density, dual-controller 48-SDD/HDD storage system is appealing to users that are outgrowing their data centers, and organizations that are building big data applications. Dot Hill Network Equipment Building System (NEBS) certified storage systems also make it an appealing supplier to telcos. The success of Dot Hill's branded business will depend upon building marketing and sales organizations that can effectively support, manage and motivate Dot Hill's indirect channels, and scaling the support organization to support end-user inquiries.

Strengths

Dot Hill's R&D is keeping its products competitive, and its OEM business ensures the cooperation of many independent software vendors (ISVs).

Dot Hill's focus on price, availability, performance/throughput, functionality and ease of use aligns well with SMB storage priorities.

Dot Hill products are available through numerous indirect channels with vertical industry expertise, with a particular focus on telcos, media and entertainment, and government organizations.

Cautions

AssuredSAN arrays' lack of snapshot integration with backup/restore solutions, such as Symantec's NetBackup and CommVault's Simpana, complicates backup management and disaster recovery (DR) failover and failback in high-availability environments.

Dot Hill's reliance on indirect channels and limited marketing presence outside of the U.S. may reduce its appeal as a supplier with large multinational corporations.

Dot Hill is still working on building its private brand support capabilities.

EMC

EMC remains a leader in the disk storage market because its management team invests heavily in its vision; is quick to correct mistakes; and is aggressive. Messaging, product announcements and acquisitions are tightly aligned and designed to reinforce EMC's position as the thought leader for storage. EMC's recent restructuring of its business units and accompanying management changes are designed to improve agility, and to better-align R&D with evolving user needs and buying behaviors. EMC uses its size to effectively sell a broad portfolio of dissimilar general-purpose storage array products, such as Isilon, VNX and VMAX. EMC has embraced market interest in cloud, flash, scale-out and converged infrastructure and big data. It has done this with functional enhancements and technical refreshes of storage arrays, and by building and/or acquiring a series of point solutions that will potentially be tied together by its software-defined storage (SDS) product ViPR. It has also, to the extent possible, insulated itself from technological surprises by acquiring potentially disruptive technologies, such as ScaleIO and DSSD, and by investing in many emerging storage-related companies still in stealth mode. EMC's acquisitions of iWave, DSSD and TwinStrata also highlight EMC's willingness to acquire technologies to improve its time to market with products that fulfill its publicly stated vision of future storage infrastructures. For example, ViPR uses iWave technology; DSSD provides global second-level cache; and TwinStrata Cloud Array gives EMC two distinct approaches to building hybrid cloud infrastructures — as a gateway to public cloud storage or to private cloud infrastructures built with Atmos or Elastic Cloud Storage, VNX, and/or and VMAX arrays.

Strengths

EMC has competitive products in every market it participates in.

A steady cadence of VMAX, VNX and Isilon product enhancements, new model announcements, software improvements and strategy white papers keep market attention focused on these products.

EMC is effective at building ecosystems and partnerships that increase its storage system attractiveness by improving ease of deployment.

Cautions

Should the reports of EMC's current exploration of restructuring opportunities prove accurate and result in an acquisition, merger or spin-offs of major business units, the impacts on EMC's storage businesses will be unpredictable.

EMC block, NAS and unified systems are no longer the undisputed leaders in availability, ease of use or price/performance.

EMC's complex portfolio and evolving suite of management tools increase the complexity and cost of deploying and managing EMC infrastructures.

Fujitsu

Fujitsu remains very much a technology-driven (rather than market-driven) company. Fujitsu has

extensive, deep and historical investments in IT in general and storage systems in particular. It builds reliable, high-quality, high-performance storage systems; has a mature, professional and effective support organization; and has a simple storage array value proposition focused on a single, compatible DX family of storage arrays that scale from small midrange to multipetabyte. Fujitsu also resells NetApp in the EMEA and Asia/Pacific regions in those instances where NetApp's comprehensive management and scale-out capabilities align better with customer needs than Eternus DX arrays. Fujitsu maintains DX storage array competitiveness with periodic technical refreshes, and newer faster controllers, cache and internal interconnects. To improve storage economics within its products, in October 2014 Fujitsu announced its CD10000 hyperscale storage array, and it is developing primary data reduction for its DX100 through DX600 series, which is scheduled to become generally available in January 2015. The CD10000, based on open-source Ceph, has the ability to provide a cloud gateway or interface with cloud APIs. Fujitsu has a reputation for being open with its customers because it provides transparent pricing and performance benchmark data, which is reviewed by independent organizations for factual accuracy. Despite having a comprehensive product portfolio of competitive products, Fujitsu's visibility in the U.S. is low because of its relative underinvestment in marketing and sales, and it is rarely thought of as a technology or market leader.

Strengths

Fujitsu storage systems are competitively priced and customers have higher-than-average satisfaction concerning reliability and performance.

Customers need to learn only one administrative graphical user interface (GUI) for the entire family of storage arrays, and backups are integrated with Commvault via the Eternus Snapshot Manager.

The smaller models offer unified, block and file storage.

Cautions

Fujitsu's product portfolio (consisting of internally developed and partner-provided storage arrays) makes infrastructure-level optimization a resource-intensive process.

Fujitsu must create a scale-out version of the DX series to extend its usable scalability into the high-end of the storage market.

A limited installed base in North America restricts the pool of DX-experienced storage administrators.

Hitachi Data Systems

Hitachi Data Systems (HDS), a wholly owned subsidiary of Hitachi, was, until recently, treated like an important channel partner rather than an integral part of the company. That relationship has evolved into Hitachi Data Systems becoming an essential part of the larger company's Information and Telecommunications Systems group. Visible signs of Hitachi Data Systems' elevated status within Hitachi include an increase in R&D outside of Japan, and an evolving sales strategy that places a greater emphasis on indirect channels and messaging centered on "IT economics," which includes making cost a design objective, rather than an artifact of new storage offerings. Hitachi Data Systems' embrace of flash technology — as well as its focus on increasing sales of Hitachi NAS Platform (HNAS) and Hitachi Content Platform (HCP), expanding Hitachi Data Systems' ecosystem, and improving ease of use — also reflects its efforts to improve its appeal as a unified storage vendor. Whether these new strategies will succeed remain to be seen. The announcement of the Virtual Storage Platform (VSP) G1000 earlier this year highlights Hitachi Data Systems' continued focus on high availability, scalability, performance and cost, and the important role that storage virtualization plays in Hitachi Data Systems' software-defined storage strategy.

Strengths

Hitachi Data Systems has a worldwide presence and brand awareness, a competitive portfolio of storage offerings, a reputation for building reliable storage systems, and a mature support organization.

Hitachi Data Systems' new flagship storage system, the VSP G1000, is better than its predecessor by almost every measure — product attractiveness, performance/throughput, availability, environmental footprint and price performance.

HNAS is a scale-out storage system that separates metadata from user data and uses silicon to accelerate performance when storing millions of small files.

Cautions

Despite Hitachi Data Systems' increased investments in its marketing and sales organizations, its price competitiveness remains unpredictable.

Hitachi Data Systems' ability to create and support a heterogeneous SDS infrastructure remains to be seen.

Hitachi Data Systems' Hitachi Unified Storage (HUS) platform is increasingly in need of a refresh, as it continues to fall behind competitors' newer, midrange offerings.

HP

HP is focusing its general-purpose R&D and go-to-market resources principally on 3PAR StoreServ, and secondly on the StoreVirtual 4000 series. HP's emphasis on 3PAR StoreServ has been a winning strategy in that it has helped HP regain market share and credibility with its resellers and user base as a provider of primary general-purpose storage. While HP will continue to provide hardware and software support and replacement components for the Enterprise Virtual Array (EVA) series installed base until at least 2017, Gartner does not expect HP to make further software or hardware enhancements to this platform. Gartner believes HP will continue its XP series OEM relationship with Hitachi because it is mutually beneficial to both companies; however, HP most likely will devote minimal marketing efforts to support this offering.

HP has released, at a steady cadence, incremental enhancements to the 3PAR StoreServ and StoreVirtual 4000 series platforms, improving performance, resiliency, capacity and functionality. While relying heavily on its reseller channel partners to produce the bulk of its storage revenue, HP's go-to-market strategy for its general-purpose external storage systems is a mix of direct sales for assigned global accounts and indirect channels for all other opportunities. Because of the diversity of HP's general-purpose storage portfolio, prospective customers must ensure that they understand that HP

and its reseller partners have taken special care to bid the appropriate solution for the right use case.

Strengths

Featuring common provisioning, management and data services software, the HP 3PAR StoreServ scale-up and scale-out architecture scales performance, capacity and cost from the lower regions of the midsize external storage market to the high-end segment, simplifying storage administration in organizations that deploy storage platforms to meet varying service-level objectives (SLOs).

When configured with four nodes or more, persistent cache, persistent ports and priority optimization, the high-end 3PAR StoreServ 10000 model's resiliency, performance and functionality compares favorably to more-expensive, frame-based high-end storage platforms.

HP has made material R&D investments to ensure that its 3PAR StoreServ and StoreVirtual 4000 series support leading hypervisors, including Citrix XenServer, Red Hat KVM, Microsoft Hyper-V and VMware vSphere.

Cautions

Until the impacts of HP's restructuring are fully understood by HP's Enterprise Group (servers, storage, and networking) and the marketplace, it could limit the storage division's ability to hire talent and distract from HP delivering on its road maps.

HP does not offer a stand-alone network-attached storage (NAS) platform that satisfies the functional, performance or capacity scalability requirements of the midrange and above NAS market.

Based on its history, HP is expected to prioritize its general-purpose midrange to high-end R&D and go-to-market resources on the 3PAR StoreServ, with minimal attention to the StoreVirtual 4000 series or the HP XP series.

Huawei

Huawei is continuing to invest heavily in its storage business across a broad variety of technologies, including flash, midrange, high-end, NAS and object storage systems, and software-defined storage. Huawei has complemented its large investment in storage R&D by reorganizing marketing and sales. Marketing is now organized by functionality rather than product line, to better align with Huawei's product integration strategy; and storage sales has been moved from the company to the IT business unit to give IT greater control over its own marketing and sales. This is a near must have if Huawei is to respond quickly in a rapidly evolving market. Huawei marketing initiatives are aligned with major market trends, such as cloud computing, big data and software-defined storage. Huawei has rebranded its storage systems to simplify product positioning and improve brand awareness by creating the OceanStor 18000 for high-end storage, the OceanStor 5000/6000 series midrange storage, and the OceanStor 9000 for high-performance computing (HPC), media and entertainment (M&E), big data and archiving applications. Huawei has recognized the difficulty of penetrating the hypercompetitive U.S. market because of geopolitical considerations, and is instead focusing on Asia/Pacific and EMEA, where Huawei's ability to compete on price is relatively more important.

Strengths

Huawei is a large profitable vendor with strong (second position in the Chinese storage market) presence and the resources needed to develop competitive storage systems, marketing and sales channels, and support capabilities.

Huawei publishes industry-standard benchmark results — a comprehensive set of availability, and local and remote replication features; is creating unified storage systems that support both block and file protocols; and is continuously expanding its ecosystem support.

Huawei is prioritizing its development resources on improving storage system scale, performance, efficiency, multitenancy, ease of use and integration with important middleware offerings, such as databases, server virtualization and virtual desktop infrastructure (VDI).

Cautions

Huawei has weak global brand awareness in the storage market and a very limited presence in North America, Japan and Western Europe, which can negatively affect its attractiveness as a storage partner and its ability to quickly detect shifts in market conditions.

Huawei's ability to build a marketing and sales organization capable of selling its concept of "Smart Data" and its value-add data services in the U.S. and EMEA remains to be seen because it will require attracting top talent and bridging cultural issues.

End users implementing Huawei solutions will almost assuredly have to invest in training their storage administrators, because the pool of storage administrators with Huawei experience is small.

IBM

IBM's current storage strategy is to sell storage systems built with its own intellectual property rather than storage systems sourced from OEMs. This has led to the termination of the OEM agreements for DS5000, DS3000 and the N series NAS, with IBM now focusing its attention on the General Parallel File System (GPFS)-based NAS solutions, such as the Storwize V7000 Unified storage system. In IBM's updated storage portfolio, the SAN Volume Controller (SVC) plays a strategic role; it provides virtualization capabilities to the DS8000; and it provides missing functionality, such as compression for the DS8000 and XIV systems. However, buyers should not expect the SVC to improve storage productivity for systems such as the XIV, which is already very intuitive and easy to administer. The V7000, built off the SVC technology, has native compression. The SVC, when bundled with the FlashCopy Manager and Tivoli Storage Productivity Center (TPC), becomes IBM's Virtual Storage Center (VSC), the data plane of IBM's SDS vision. From a customer engagement and storage management perspective, IBM is presenting a higher-level management value proposition by emphasizing productivity gains via its data economics go-to-market approach. As IBM rationalizes its product offerings and increases its use of indirect channels, users should take advantage of the channel with the most vertical industry expertise, implementation services, support and/or lowest pricing.

Strengths

IBM is standardizing on the look and feel of the XIV administration interface, which is a very

modern, intuitive icon-based system that is extremely simple to use.

SVC-based products are used across the portfolio to provide compression and productivity benefits while positioning users to take advantage of the VSC.

IBM's high-level business value sales approach assists users in developing optimized storage infrastructure design visions.

Cautions

The lack of timely responses to competitors' new product announcements, coupled with IBM's termination of its OEM relationship with NetApp and its divestiture of its server business, has created user concerns about IBM's commitment to the disk storage business.

IBM's termination of its OEM agreement with NetApp will force N series users to change vendors if they want to continue using NetApp technology or to convert to a new storage solution.

IBM's reliance on the SVC for missing capabilities and features complicates sales cycles and adds expense and complexity to IBM storage solutions.

Infortrend

Headquartered in Taipei, Taiwan, Infortrend has established a successful technology innovation and financial track record providing storage technology to OEMs, system integrators (SIs), distributors and value-added resellers (VARs). Since October 2013, Infortrend has placed its R&D and marketing weight behind the new EonStor DS3000 family of midrange hybrid storage arrays and away from the aging Enterprise Scalable Virtualized Architecture (ESVA) midrange storage platform. While the EonStor DS3000 is appropriate for deployment as an all-purpose storage array, Infortrend is placing particular marketing emphasis on applications requiring high performance and dense storage capacity. To augment the EonStor DS3000 hybrid storage array offering, Infortrend introduced the EonNAS 3000 series in September 2013. The EonNAS 3000 series is based on open ZFS, enabling Infortrend to address file-based applications as well as unified storage infrastructure opportunities. While Infortrend is principally successful in penetrating the Chinese and Taiwanese markets, it is facing serious competition from China-based Huawei and Sugon. In North America, the Asia/Pacific region and Japan, Infortrend employs a direct and indirect channel go-to-market strategy; while in EMEA, Infortrend reaches end users via indirect channels. Publicly listed on the Taipei stock exchange, Infortrend is reporting year-over-year revenue gains and positive net operating results for its most recent fiscal year.

Strengths

The EonStor DS3000 is a foundational hybrid external storage platform that features dual active/active controllers, with thin provisioning, automatic storage tiering, and basic snapshot and volume/copy mirroring functionality included within the price of the system.

With upgraded ease-of-use features, SANWatch 3.0 is the browser-based cross-platform software-centralized management suite used to discover, configure, administer and monitor all Infortrend block-access storage platforms, enabling users to mix the new EonStor DS3000 with installed ESVA infrastructures.

Infortrend is a small but established provider of external storage platforms with a global presence enabling localized sales, service and support.

Cautions

Noting stagnating sales and declining R&D investments, coupled with the increasing focus on the newer EonStor DS3000, Gartner believes that the ESVA, originally released in 2009, is on a journey to end-of-life status.

Infortrend's EonStor DS3000 pricing model requires the user to pay an additional license fee for the advanced versions of snapshot and volume copy/mirror replication software.

The EonStor DS3000 currently lacks support for multitenancy, dynamic load balancing between controllers, and quality-of-service functionality.

NEC

NEC is a relatively new entrant into the worldwide enterprise storage market. It has little customer or brand awareness and a small market share outside of Japan. Since 2012, however, it has been expanding outside Japan, but market traction remains muted. Over the past 18 months, NEC has completed the introduction of its more powerful and better-featured midrange M-Series hybrid external storage arrays, placing the older D-Series on end-of-life status. Composed of four models, the new M-Series platforms incorporate the technical and engineering features associated with optimizing power/cooling consumption (power consumption monitoring and massive array of idle disks [MAID]), and product-life-cycle ownership issues (simple migration between arrays). To enhance its traction in the Americas, NEC has launched a new go-to-market program to attract value-added resellers that buy into the NEC value proposition of high performance, superior product quality, ease of use and managed distribution overlap between VARs. NEC America has also streamlined its software pricing structure by creating bundles to support specific functionality requirements. However, despite these initiatives, market traction outside of Japan belies the competitive strength of the M-Series.

Strengths

Software licenses are perpetual, with pricing tied to the M-Series controller with no upside charges as capacity increases over time.

Reliability is high, and the storage is competitively priced for customers that require a well-featured storage array with key mainstream storage data services, such as autotiering, thin provisioning, snapshots, replication, self-encrypting drives and virtual cache partitioning.

NEC is making the necessary R&D investments to ensure that the M-Series is compatible with the latest developments from VMware and Microsoft. VMware support includes vSphere Web Client plug-in, vCenter plug-in, vStorage APIs for Array Integration (VAAI), VASA and vCenter Site Recovery Manager (SRM).

Cautions

The NEC M-Series of hybrid external storage arrays does not support deduplication and compression data reduction functionality, curtailing its competitiveness in deployments such as hosted virtual desktop, backup and databases that can benefit from these utilization efficiency

features.

Positioned as NEC's high-end offering, the dual controller Storage M700 model does not have sufficient resiliency, performance scalability or capacity scalability relative to competing high-end external storage arrays.

Outside of Japan, NEC has a limited number of customer references available to validate vendor claims about performance, reliability and ease of use.

NetApp

NetApp has become a storage portfolio company. With the repositioning of its E-Series as a general-purpose storage system, and with the 17 September 2014 launch of FlashRay, NetApp is now selling three architecturally different storage systems across very divergent vertical markets. Customers will have to learn how to administer and integrate these three different systems because Flash Array Storage (FAS), E-Series and FlashRay do not share a common management tool or different management tools with the same look and feel. The E-Series, now positioned as a high-performance general-purpose storage solution, can be configured with a mix of HDDs and SSDs. The degree of product overlap between NetApp storage systems will vary based primarily on protocol, capacity, performance and data protection requirements. Clustered Data Ontap shows vision and technical ingenuity in solving 7-Mode operational limitations that include increasing the usable scalability of FAS arrays, nondisruptive transparent data migrations between FAS arrays, load-balancing between high-availability controller pairs and improving the robustness of MetroCluster deployments. NetApp publishes transparent and independently verified performance benchmarks for its latest FAS8000 series to improve performance and cost transparency, and to make customer purchase decisions simpler.

Strengths

NetApp has a very large installed base of small systems that provides it with deep insights into user needs and the resources needed to develop solutions that satisfy those needs.

Ontap software can be deployed on FAS arrays built with industry-standard components or in the cloud.

Simple management for the FAS and extensive SDS reporting and features are available within the OnCommand suite.

Cautions

Difficult conversions from 7-Mode to Cluster-Mode are causing many users to delay the conversion, and/or leading users to evaluate other storage solutions.

The variability in service/support quality that users experienced between the FAS and E-Series when the E-Series was launched suggests that users should reference check FlashRay support as part of their due diligence.

NetApp's noninclusive FAS software pricing model and relatively high maintenance costs often make FAS arrays expensive relative to storage arrays provided by emerging storage companies.

Nimble Storage

Nimble Storage has emerged as the model for new up-and-coming enterprise storage vendors that embraced the transition from HDD-focused architectures to SSD-focused architectures. In December 2013, Nimble had a successful IPO, and with revenue increasing 98% annually in the first six months of its current fiscal year, Nimble continues to implement its strategy of rapidly growing its top line while incrementally improving operational results. At the same time Nimble is sustaining dedication to its channel go-to-market fulfillment model, it is also devoting a larger percentage of its sales organization to penetrating Global 5000 enterprises and cloud service providers in an effort to further accelerate revenue growth. Over the past 18 months, Nimble has released a parade of new products and enhancements including the more powerful CS700 platform, All-Flash Shelf, the four-node cluster configuration, triple parity RAID, a storage-on-demand pricing model, and material enhancements to its core Cache Accelerated Sequential Layout (CASL) file system and InfoSight customer support system. Nimble is making considerable R&D investments to deepen integration with leading technology partners including Cisco, Citrix, CommVault, Microsoft, Oracle, Veeam and VMware. To further enhance its competitive position, Nimble has partnered with Cisco to create a series of SmartStack converged infrastructure solutions based on Cisco's UCS and Nimble's CS-Series storage platforms. Nimble's success has attracted the attention of the larger incumbent external storage vendors that are developing countercompetitive strategies to blunt Nimble's encroachment into their installed bases.

Strengths

The CS-Series CASL file system enables Nimble to simultaneously optimize performance, capacity utilization, form factor, environmental sustainability and total cost of ownership (TCO) compared to traditional storage area network (SAN) offerings.

The Nimble cloud-based InfoSight customer support system facilitates rapid problem identification/resolution (Nimble reports that greater than 90% of cases are opened automatically and greater than 80% of cases are closed automatically), and provides users with online proactive trending and forecasting advice regarding capacity and performance headroom, increasing the likelihood that Nimble will be able to provide quality postsales support as it scales its business.

Reflecting its dedication to customer satisfaction and transparency, Nimble has implemented NimbleConnect, an online customer community that fosters the establishment of peer relationships and shared learning among its user base.

Cautions

The CS-Series arrays are block-only storage systems that, as of November 2014, support iSCSI and FC protocols; however, market validation of FC protocol support will probably require at least three to six months.

The Nimble CS-Series does not support deduplication functionality, restricting performance and capacity utilization efficiency in HVD deployments.

Support for robust quality of service, multitenancy, synchronous remote replication and controller-based encryption remain missing functionalities that are important to Global 5000 enterprises and cloud service providers.

Oracle

Oracle's general-purpose stand-alone disk storage portfolio consists of the Sun ZFS Storage Appliances and the new Oracle FS1-2 Flash Storage System, which became generally available in November 2014. Both the ZFS and FS1-2 are hybrid multiprotocol systems supporting block and NAS protocols. Oracle has positioned the ZFS appliance as primarily a NAS array and the FS1-2 hybrid storage system as primarily a block protocol storage array. The FS1-2 series replaces Pillar Axiom products, which are no longer actively being marketed. Even though these storage arrays are highly capable general-purpose disk arrays suitable for many workloads, Oracle marketing, innovation and R&D are concentrated on making these arrays the best choice when supporting Oracle servers and Oracle applications. More new proprietary Oracle features, such as Oracle Intelligent Storage Protocol (OISP) and Automatic Data Optimization (ADO) are being added to the storage arrays, and the Oracle software, server and storage stack. Customers should not expect that Oracle will be the first to support non-Oracle servers, hypervisors or operating systems. Oracle storage is primarily designed and sold to Oracle customers running Oracle hardware and software. Non-Oracle hardware and software support does become available, but it is not the top priority when a new Oracle storage array is launched.

Strengths

Oracle provides transparency in cost and performance by publishing and taking part in independently reviewed and publicly available benchmarks, such as SPC-2.

Hybrid Columnar Compression (HCC) improves upon already competitive performance, purchase costs and feature licensing.

The company offers very detailed performance and usage instrumentation and reporting within the ZFS ZS3-2 and ZS3-4 arrays.

Cautions

The FS1-2 Flash Storage System is a new hardware platform with significant microcode changes, and with performance improvement assertions that will not be market-validated for at least three to nine months.

Certain Oracle features, such as columnar compression, work only when Oracle Databases are connected to Oracle storage hardware.

When using ZFS Appliance as a general-purpose backup, target ingest and data reduction ratios may be lower than when backing up Oracle engineered systems.

Promise Technology

Promise Technology caters to customers that have high-performance data requirements, but are price-sensitive. Its solution is largely deployed in applications such as HPC, streaming video for surveillance, video editing, content creation and image enhancement, as well as for backup and archiving. Because of this, Promise augmented its established VTrak Ex30 storage platform offering with the VTrak A3800 shared SAN appliance. Targeted at shared digital media production applications, the VTrak A3800 features the VTrakFS file system that supports a scale-out SAN architecture. Promise's go-to-market strategy is to customize disk storage solutions to fit a particular partner use case and to leverage the larger market presence of its partner to gain branded market traction. The most visible example of this strategy is the successful relationship with Apple, where Promise VTrak Ex30 is positioned as a storage platform of choice to support the Apple MacPro with OS X Server and OS X Mavericks. Promise has also strengthened its general VAR marketing programs in order to further expand market reach. Publicly listed on the Taipei stock exchange, Promise Technology is reporting 12.7% year-over-year revenue gains and positive net operating results for its most recent fiscal year.

Strengths

Promise provides timely certification with Apple's latest software, including OS X Mavericks, as well as support for asymmetric logical unit access (ALUA) to enhance availability and load balancing in a SAN infrastructure.

The VTrak A3800 shared SAN appliance with the 64-bit VTrakFS file system enables users to nondisruptively scale performance and capacity under a single global namespace and a single management GUI by adding up to a maximum of nine VTrak x30 storage nodes, all of which can run concurrently.

Promise VTrak Ex30 disk storage system fully meets Apple's performance, reliability and quality specifications, as indicated by its placement on Apple's website.

Cautions

Promise has not developed VMware's vStorage APIs for SRM, VAAI and VASA for the VTrak A3800 and VTrak Ex30, which could improve storage and operational efficiency.

The VTrak A3800 and VTrak Ex30 do not support data reduction (deduplication and/or compression) functionality, thereby increasing the amount of raw capacity required in backup and archiving deployments.

The VTrak A3800 and VTrak Ex30 storage systems do not include thin provisioning, autotiering, self-encrypting drives, quality of service, multitenancy or local and remote replication functionality, which diminishes their appropriateness for deployment to support general-purpose applications.

Tegile

Tegile, founded in 2010, has achieved market visibility with its IntelliFlash hybrid storage system by positioning it as a modern flash-centric architecture that differentiates itself with multiprotocol support, a consistently high performance/throughput, an all-inclusive pricing model and aggressive pricing. IntelliFlash delivers low usable \$/GB prices by implementing thin provisioning, compression and deduplication, and autotiering that manages SSDs as second-level cache. Managing SSDs as second-level cache enables IntelliFlash systems to respond quickly to changes in workloads, and it simplifies management but at the cost of giving up some of the control that managing SSDs as a separate tier of storage provides. Marketing and sales staffing and programs are designed to support Tegile's 100% indirect channel strategy, grow EMEA revenue and expand coverage into Asia/Pacific. Vertical markets are prioritized based on their ability to take full advantage of IntelliFlash system performance and storage efficiency features; among the more obvious of these are virtualized servers, VDI and virtualized database use cases.

Strengths

IntelliFlash storage systems support FC, iSCSI, Network File System (NFS), and Server Message Block (SMB; aka Common Internet File System [CIFS]) protocols, and IntelliFlash ecosystem support aligns well with its target markets.

IntelliFlash's architecture has comprehensive instrumentation, utilizes different flash technologies for read/write caching, and enables users to independently scale performance and capacity to meet application needs.

Aggressive pricing, when necessary, coupled with compression and deduplication of primary active data, gives IntelliFlash a strong value proposition.

Cautions

Synchronous replication is not available, only asynchronous replication.

Tighter integration with backup/restore solutions and even better instrumentation are needed to enable larger IntelliFlash deployments.

Scaling Tegile's support organization to keep pace with customer growth will be a challenge, particularly as it expands into Europe and Asia/Pacific.

Tintri

Founded in 2008, Tintri builds storage for virtual machines — not physical servers. Tintri is included in this research because more than 50% of today's workloads run in virtual machines as opposed to on physical servers. In Tintri VMstore, the atomic unit of management is the virtual disk (vDisk), rather than a physical logical unit number (LUN) or file system. This specialization eliminates the complexity that is inherent in provisioning virtual machines with LUNs and file systems. Directly provisioning virtual machines also improves staff productivity, eliminates the need for tuning individual VMs, and makes automation easier. VMstore series highlights include NFS protocol support (and SMB3 support expected by the end of 2014), autotiering, thin provisioning, data compression and deduplication, snapshots, asynchronous replication, a hybrid SSD/HDD architecture, an active/passive controller design that eliminates the impact of controller failure on system performance/throughput (but at the cost of not fully utilizing all of the system's electronics), and Tintri Global Center that can manage up to 32 VMstore systems. Tintri's go-to-market strategy is centered on indirect channels that have the technical expertise to add value by helping users to automate workflows and drive repeat business.

Strengths

Tintri now has the installed base and resources needed to continue growing and enhancing its VMstore series.

The VMstore architecture delivers a consistent performance experience by eliminating many of the configuration and process errors that cause bottlenecks.

Tintri channel partners are providing positive deployment experiences.

Cautions

Nondisruptive dynamic load balancing between VMstore systems is not yet available, which limits its attractiveness in large environments.

Competition from VMware Virtual Volumes (VVols), SSAs, integrated platforms and SDS may neutralize VMstore's advantages.

Tintri is more vulnerable than other storage vendors to hypervisor vendors commoditizing VM storage.

X-IO Technologies

X-IO has put in place a new marketing team and revised its go-to-market messaging to better differentiate its Intelligent Storage Element (ISE) technology from emerging and established competitors' storage offerings by riding market and technology trends that are useful, and fighting those that create sales problems. X-IO has rebranded its ISE and Hyper ISE systems as the ISE 200 and ISE 700 respectively, to rationalize its offerings; and it has invested much of its R&D on improving ecosystem support and ease of use. Comfortable with ISE "feeds and speeds," X-IO has targeted high-performance DBMS and big data applications, server and desktop virtualization, private and public cloud, universities, and government agencies with messaging centered around high availability, high performance and five years of free maintenance. X-IO's Continuous Adaptive Data Placement (CADP) algorithm responds in near real time to changes in workload profiles by moving data between SSD and HDD tiers to deliver a consistent performance experience, even at high utilization rates. Recognizing that the virtualized server and virtualized desktop infrastructure markets have embraced SSAs, X-IO is countering with claims of competitive performance, higher usable availability and lower ownership costs, and tight integration with server hypervisors.

Strengths

X-IO has grown revenue year over year with more aggressive outbound marketing, an increased channel focus and a creative "pay after you go" program that allows storage service providers to generate revenue on installed ISE systems before paying for them.

ISE's self-repair capabilities continue to give it an order-of-magnitude improvement in frequency-of-repair activities over other storage systems that replace HDDs when problems are detected, and makes it possible for X-IO to offer a standard five-year warranty. This self-repair capability also improves ISE's attractiveness for deployments in remote locations with limited access to field engineers (FEs) and spares.

ISE's investments in ecosystem support and white papers has expanded ISE's support for VMware ESX, Hyper-V, XenServer and Red Hat KVM.

Cautions

The limited scalability of ISE and a lack of asynchronous remote replication facilities requires storage architects to modify their infrastructure vision and DR strategies.

ISE's reliance on hypervisor or server-resident software to provide missing features, such as thin provisioning and replication, often creates a need for the deployment of heterogeneous storage infrastructures.

Without a cadence of ISE enhancements and new product announcements, X-IO may be viewed

as a dated product.

Vendors Added and 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's appearance 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. It may be a reflection of a change in the market and, therefore, changed evaluation criteria, or of a change of focus by that vendor.

Added

Tegile
Tintri

Dropped

Coraid
Nexsan
SGI

Inclusion and Exclusion Criteria

The criteria enumerated below are intended to include established and emerging vendors selling midrange and high-end disk storage systems that support block-access, file-access or converged (block and file) protocols. Commonly supported protocols include FC, iSCSI, CIFS, and NFS. Less commonly used, but still qualifying, protocols include InfiniBand, FCoE, and AoE. These systems are configured with HDDs and, optionally, with SSDs.

Product Criteria:

Bundled all the hardware and software needed to store and retrieve data using industry-standard block and/or file host connection protocols into a storage array.
Implemented architectures with no single points of hardware failure.
System sold through indirect or OEM channels, maintained brand awareness with end users and has an average selling price of more than \$24,999.

Vendor Criteria:

Annual company revenue of \$25 million or more.
A multinational presence and 24/7 support capabilities.

Notes:

z/OS support is no longer used as a boundary separating midrange from high-end storage arrays.
Inclusion of dual controller, scale-out and high-end storage systems in the same Magic Quadrant does not imply that the differences in usable availability, scalability, performance/throughput and functionality of these different architectural approaches are insignificant.

Evaluation Criteria

Ability to Execute

The Ability to Execute axis highlights the change in vendor positioning directly attributable to vendor actions. Criteria that provide relatively high levels of vendor and product differentiation are more highly weighted than those that have relatively little ability to provide differentiation.

Table 1. Ability to Execute Evaluation Criteria

Evaluation Criteria	Weighting
Product or Service	High
Overall Viability	Medium
Sales Execution/Pricing	High
Market Responsiveness/Record	Medium
Marketing Execution	High
Customer Experience	High
Operations	Medium

Source: Gartner (November 2014)

Completeness of Vision

The Completeness of Vision axis highlights the change in vendor positioning directly attributable to vendor actions. Criteria that provide relatively high levels of vendor and product differentiation are more highly weighted than those that have relatively little ability to provide differentiation.

Table 2. Completeness of Vision Evaluation Criteria

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Evaluation Criteria	Weighting
Market Understanding	Low
Marketing Strategy	Medium
Sales Strategy	High
Offering (Product) Strategy	High
Business Model	High
Vertical/Industry Strategy	Medium
Innovation	High
Geographic Strategy	Low

Source: Gartner (November 2014)

Quadrant Descriptions

Leaders

Vendors in the Leaders quadrant have the highest scores for their Ability to Execute and Completeness of Vision. A vendor in the Leaders quadrant has the market share, credibility, and marketing and sales capabilities needed to drive the acceptance of new technologies. These vendors 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 disk array market and executes well enough to be a serious threat to vendors in the Leaders quadrant. They have strong products, as well as sufficient credible market position and resources to sustain continued growth. Financial viability is not an issue for vendors in the Challengers quadrant, but they lack the size and influence of 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.

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 disk array vendors. This quadrant may also include vendors that are ramping up their disk arrays or larger vendors having difficulty developing and executing upon their vision.

Context

This Magic Quadrant represents vendors that sell into the end-user market with branded disk arrays. An insatiable demand for storage, tight budgets caused by difficult economic conditions, and skills shortages have caused users to focus on flash technologies to solve performance problems; storage efficiency and ease-of-use features to enable them to keep pace with a more stringent regulatory environment; and the need to take advantage of big data analytics to create competitive advantage by identifying new product opportunities and new marketing and sales strategies before competitors. This will speed product development and improve the quality of business decisions by enabling users to do more realistic "what if" analysis.

Market Overview

Historically, Gartner segmented the storage market by architecture, protocol support and price bands to facilitate a better understanding of storage market dynamics and to assist clients in designing infrastructure refreshes. However, improvements in technology have led users to treat high-end, midrange and NAS systems as roughly equivalent, and to allow them to compete against each other — even in business-critical environments, although high-end storage systems retain advantages in availability, performance/throughput, recovery point objectives (RPOs) and software ecosystem support. Indeed, we are beginning to see the same behavior occurring with SSAs. Storage vendors with significant high-end storage revenue and markets to protect have responded by introducing lower-capacity high-end models, which are positioned to compete with larger midrange storage. Examples of these entry-level high-end storage systems include EMC's VMAX 10K and Hitachi Data Systems' HUS VM.

Gartner expects the advantages of traditional high-end enterprise storage arrays to disappear over the next three to five years as scale-out architectures and integrated platforms continue to gain market and mind share. Gartner does not expect any new storage vendors to enter the traditional high-end segment; the barriers to entry in this market segment are high, and its share of the overall storage market is in long-term decline. Even as the traditional markets are coalescing, we are witnessing the creation of an SSA market, which we are acknowledging with the creation of the SSA Magic Quadrant and SSA Critical Capabilities research.

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