

Magic Quadrant for Solid-State Arrays

Published: 23 June 2015

Analyst(s): Valdis Filks, Joseph Unsworth, Arun Chandrasekaran

Solid-state arrays provide performance levels an order of magnitude faster than disk-based storage arrays at competitive prices per GB, enabled by in-line data reduction and lower-cost flash memory. This Magic Quadrant will help IT leaders better understand SSA vendors' positioning.

Strategic Planning Assumptions

By 2019, the SSA market is expected to grow approximately five times in revenue from the current market size of \$1.43 billion in 2014.

By 2017, the total number of vendors will increase by 50%, but 20% of the current vendors will exit the market.

By 2020, the percentage of data centers that will use only SSAs for primary data, instead of hybrid arrays, will increase from 0% today to 25%.

Market Definition/Description

This Magic Quadrant covers solid-state array (SSA) vendors that offer dedicated SSA product lines positioned and marketed with specific model numbers, which cannot be used as, upgraded or converted to general-purpose or hybrid storage arrays. For specific SSA product analysis, please see the companion note "Critical Capabilities for Solid State Arrays."

Considering the potentially disruptive nature of SSAs on the general-purpose external controller-based (ECB) disk storage market, Gartner has elected to report only on vendors that qualify as an SSA vendor. We do not consider solid-state drive (SSD)-only general-purpose disk array configurations in this research. To meet these inclusion criteria, SSA vendors must have a dedicated model and name, generally available by 31 December 2014, and the product cannot be configured with hard-disk drives (HDDs) at any time. These systems typically (but not always) include an OS and data management software optimized for solid-state technology.

Magic Quadrant

Figure 1. Magic Quadrant for Solid-State Arrays



Source: Gartner (June 2015)

A vendor's position on the Magic Quadrant should not be equated with its product's attractiveness or suitability for every client's requirements. If the solutions better fit your needs, have the appropriate support capabilities and are attractively priced, then it is perfectly acceptable to acquire solutions from vendors that are not in the Leaders quadrant.

Vendor Strengths and Cautions

Cisco

Cisco entered the SSA market through the acquisition of Whiptail in 2013. In 2014, Cisco briefly halted the shipping of solid-state arrays due to quality issues. After re-engineering efforts that involved transitioning from white-label hardware to Unified Computing System (UCS) hardware design and fixing critical software bugs, the Cisco UCS Invicta series was relaunched in January 2015, having been closely integrated with UCS fabric and management platforms. Cisco now offers two products — UCS Invicta Appliance and the UCS Invicta Scaling System — segmenting the market based on customer needs for scalability and performance. The Invicta Appliance is a 2U appliance that can scale up to 24TB, while the Invicta Scaling System can scale up to six nodes for a maximum raw capacity of 144TB.

Strengths

- The Invicta series offers customers the flexibility to start small, and then cost-effectively scale based on workload characteristics.
- Cisco UCS customers benefit from Invicta's close integration with UCS Director and UCS Fabric Interconnects.
- Deduplication is offered as an add-on feature, allowing customers to trade off data reduction for performance based on specific application requirements.

Cautions

- There hasn't been much innovation and sales execution from Cisco after the Whiptail acquisition, casting a shadow on Invicta's future.
- The attrition in the Whiptail organization and the lack of focus on SSAs from Cisco are negatively impacting implementation and technical support services.
- Pricing is still on an a la carte basis, charging for individual data services such as deduplication and replication, while most other vendors are gravitating toward unified, all-inclusive base pricing.

EMC

EMC offers two SSA products on the market: XtremIO and the VNX-F; however, EMC leads with XtremIO as its strategic SSA offering. XtremIO was purpose-built as a scale-out SSA. It is the only EMC offering with in-line data reduction, and it was designed from inception to be simple to administer and operate. As it did with the disruptive upgrade in September 2014 that resulted in several disgruntled customers during the 2.4 to 3.0 migration, EMC is able to quickly address upgrade issues and reduce migration outages. Overall, EMC has been able to successfully sell and market XtremIO due to its vast sales force, channel bandwidth and execution prowess. The XtremIO

product has gone through several software updates in the past year, and EMC has additional changes in the pipeline to improve reliability, performance and data protection.

Strengths

- EMC has highly responsive sales and marketing organizations, which publicly and very successfully articulate XtremIO roadmaps, problems, fixes and issues.
- EMC provides existing customers with higher-than-competitor discounts, and advantageous XtremIO purchase terms for warranty and maintenance.
- EMC has an extremely capable in-house global support and service organization that is responsive with upgrade equipment when customer have to perform upgrades and replacements.

Cautions

- XtremIO's cadence of fixes and software upgrades has been, and will continue to be, overwhelming for many customers as the vendor strives to achieve feature parity or exceed the capabilities of competitors.
- XtremIO provides global deduplication, but it does not have detailed data reduction reporting by logical unit number (LUN) or volume; data reduction reporting is only available at the X-Brick or cluster level.
- Extra products such as RecoverPoint and VPLEX often need to be purchased to provide high availability and replication, at extra cost and administration complexity.

Fujitsu

With the Eternus DX200F becoming available in June 2014, Fujitsu is a latecomer to the SSA marketplace as it took a long time for it to decide whether to stay with a hybrid general-purpose array product strategy containing tiers of SSDs and HDDs, or to have an additional dedicated SSA offering. Fujitsu's short-term tactics are to resell the Violin Memory SSA when customers require larger capacity SSAs, and the DX200F when smaller capacities are required. This will continue until Fujitsu has its own larger capacity offerings and data reduction ability. Fujitsu also offers an inclusive software licensing method, which makes it quicker and simpler for customers to purchase all features and expand the array with fewer hidden and upgrade costs.

Strengths

- The product offers proven synchronous and asynchronous replication features based on the DX array software.
- There is common administration and configuration software between all disk and solid-state arrays.
- High-availability clustering provides quick failover and synchronization between systems.

Cautions

- Eternus DX200F is a relatively new product, with few public references and case studies.
- The product has no in-line data reduction features, such as deduplication and compression.
- Fujitsu has limited sales and support coverage in the Americas.

HP

HP continues to invest in its solid-state array portfolio through enhancements in its existing 3PAR StoreServ 7450c product, as well as the introduction of a cost-effective, entry-level solution: the 3PAR StoreServ 7200c All-Flash Array. The 3PAR hardware architecture and management platform lends itself well to efficient use of underlying SSD technology, and to quality of service (QoS), which continues to improve. The SSA product portfolio is robust and excels in key functionality like thin provisioning and resiliency; however, it still lacks other key features such as compression. HP's scale-out approach and lower entry point in the market was supported by a regvanized sales and marketing campaign that paid dividends for HP during 2H14, with substantial revenue recognition and market share gain. HP's sales and channel execution was supported by an aggressive pricing campaign that points back to the efficiency of HP's hardware architecture.

Strengths

- Proven reliability, features and scale within the 3PAR architecture with a single, familiar platform appeals to HP's existing general-purpose storage array customer base.
- Given its efficient use of SSD capacity, HP can sustainably offer very aggressive pricing that can rival nearly all vendors.
- HP has demonstrated that its sales and channel bandwidth can quickly scale to attract, address and react quickly to the needs of a growing, global installed base.

Cautions

- Full in-line deduplication effectiveness is relatively unproven, and compression is currently unavailable.
- HP offers a cost-effective alternative; however, a demonstrable ROI is needed to distinguish that its product functionality and capability can rival other feature-rich offerings.
- HP's reporting and analytical features continue to evolve, but need further improvement.

Huawei

Huawei's SSA product line consists of the OceanStor Dorado5100 and Dorado2100 G2 series, which are second generation, and the recently introduced OceanStor 18800F. Because it is headquartered in China, Huawei derives more than half of its revenue from Asia/Pacific customers, but has had severe brand perception and execution challenges in the U.S. Huawei relies on its

direct sales force to generate a majority of its SSA sales, although channel development efforts are starting to pay off in Asia (outside of China), EMEA and South America. Huawei has an aggressive sales approach, offering steep discounts off the list price for qualified enterprise customers. From an engineering perspective, Huawei has significant R&D investments in flash, with deep vertical integration through design and development of application-specific integrated circuit (ASIC)-based SSD controllers and SSDs.

Strengths

- Huawei has multiple hybrid and solid-state product lines aimed at common customer workloads across block, file and object protocols with a common management interface.
- It offers differentiated performance improvements and pricing flexibility due to its vertically integrated design and engineering enhancements.
- Huawei is striving to create transparency around its performance through participation in standardized benchmarking tests.

Cautions

- Huawei's support capabilities outside of China are weak, effecting resolution times for complex problems.
- Innovation at the software layer continues to lag behind hardware-layer enhancements.
- When Huawei introduces data reduction capabilities in its product line, customers need to be prepared to cope with a disruptive upgrade.

IBM

IBM understands the changing direction of the storage array market, evidenced by its aggressive investments in its SSA products and a renewed sales focus. IBM led and outgrew the market in terms of shipments; however, it did not grow as fast as the market in revenue. While this indicates an aggressive pricing strategy and successfully selling into its installed base, it also signifies the need to add more premium data management services as it continues to expand in and outside of its customer base.

IBM procures NAND components, which it optimizes through its own engineering and testing. These efforts were further enhanced via a strategic NAND relationship announcement with Micron Technology that allowed IBM to make performance and reliability improvements. This latest announcement coincides with the debut of IBM FlashSystem V9000 and IBM FlashSystem 900, which are updates to IBM FlashSystem V840 and IBM FlashSystem 840. FlashSystem V840 is based on IBM Spectrum Virtualize software and the underlying FlashSystem hardware, which provides the all-flash storage capacity. The Spectrum Virtualize software, which is the new name for the SAN Volume Controller (SVC) software component, provides data services and virtualization capabilities.

Strengths

- IBM has a strong heritage in providing a high-performance SSA with the ability to adapt to changing storage technologies.
- IBM has a strategic supplier NAND relationship for flash cost and quality optimization, which provides security of supply for its customers.
- There is a consistent investment and cadence of additional hardware development and software product updates.

Cautions

- IBM Spectrum Virtualize software has the majority of its software used in many other IBM storage products, which implies software, update and fix dependencies, plus resource prioritization challenges.
- No native deduplication features are offered, but they can be provided by IBM partners — such as Atlantis Computing and Permabit — at extra cost and complexity.
- Leveraging IBM Spectrum Virtualize software that sits in the data path introduces additional latency, rack space requirements and potential high-availability challenges, and more elements to service, when compared to FlashSystem 840.

Kaminario

Kaminario is one of the more tested SSA startups. Delivering its products for more than four years, it is now on its fifth-generation product. The Kaminario K2 architecture is a mature and proven platform offering flexible deployment through a scale-up or scale-out approach. It has versatile selectable data reduction options at the LUN level. Array design decisions provide Kaminario with the ability to leverage more cost-effective SSD technology with little compromise. The company promotes transparency with its business programs and public benchmarks. Kaminario has improved its awareness with creative marketing efforts, which paid off in 2014 as it more than doubled its sales. After raising \$68 million between December 2014 and February 2015, Kaminario will now need to raise its mind share further in order to attract leading channel partners, grow internationally and, ultimately, continue to grow sales.

Strengths

- Kaminario has a scale-up/scale-out architecture with rich features that has demonstrated strong performance and reliability over its past five product generations.
- Kaminario utilizes flexible storage efficiency and resiliency technologies to maximize cost structure that enables its bold guarantee program for an average of \$2/GB usable capacity.
- With its recent funding raise from December 2014, Kaminario continues to invest in execution through global channel expansion.

Cautions

- Kaminario has limited marketing ability to gain mind share, which is important in order to expand its sales channel bandwidth and long-term viability.
- Sales and support is focused on the U.S. and Europe, so buyers outside these geographies should understand support ramifications and Kaminario's ability to scale support.
- Kaminario's interoperability with independent software vendors (ISVs) trails competitors in the depth of integration with VMware, Microsoft and OpenStack hypervisor and cloud management APIs.

NetApp

NetApp was a late entrant into the SSA market, with a diverse portfolio consisting of three distinct products. While its execution is consistent, it has grown at a slower rate than the market. The EF-Series (based on the hybrid E-Series) remains the flagship product, and is focused on workloads that do not need data reduction capabilities. The All-Flash FAS, productized during June 2014, is aimed at the traditional fabric-attached storage (FAS) customers who would like to preserve their investments in that platform but need more robust performance than what hybrid arrays can offer. FlashRay is planned as NetApp's purpose-built product for solid-state media, although it is still in limited availability status. Given the overlap between the three different products and the complexity that arises from that overlap, NetApp tries to segment and qualify customer workloads to the appropriate product through workload analysis tools, which channel partners and its internal sales force can leverage. Our conclusion is that, in the long term, the FAS SSA will be the strategic product for NetApp and will incorporate elements of FlashRay.

Strengths

- Both the EF-Series and FAS series are mature products that have a large installed base, offering existing customers platform continuity and management familiarity.
- NetApp has continued to deliver performance enhancements to the EF-Series that include newer CPUs and faster host interfaces (12Gb SAS and 56Gb InfiniBand, in addition to 16Gb FC and 10Gb iSCSI).
- All-Flash FAS is now available as part of the FlexPod reference architecture, which has a strong momentum having achieved \$3 billion in sales since its inception in 2010.

Cautions

- There is significant overlap in NetApp's solid-state array product portfolio, with three different products causing confusion among customers about sustainable innovation and long-term viability of each of these products.
- FlashRay, which was announced in 2014 — but is still in limited availability as a single-controller array with several missing software functionalities — raises questions about the ability of NetApp to be competitive amid rapid innovation from competitors.

- The lack of data reduction capabilities limits the appeal of EF-Series in server virtualization, virtual desktop infrastructure (VDI) and online transaction processing (OLTP) consolidation use cases.

Nimbus Data

Nimbus Data had the foresight to see the advantages of SSA, and so was one of the early entrants into the SSA market. However, it has not grown as fast as the market. The vendor specializes in and concentrates on selling to large customers. The vendor's management structure is lean, and it often does not have the resources to work within or expand out of its existing installed base. Many customers who approach Nimbus Data and request information, offers, quotations and participation in RFIs and RFPs do not receive an answer. Due to lack of resources and external funding to expand, its market share has been declining.

Strengths

- Nimbus Data has wide feature and unified block and file protocol support, plus InfiniBand.
- The product performs well in high-performance, bandwidth and latency-sensitive environments.
- Nimbus Data has a broad product portfolio of array capacities that boasts cost-effective price points given the usage of consumer-grade flash technology.

Cautions

- The vendor has a highly centralized top-down management approach, and this narrow executive hierarchy challenges decision making and could be problematic for long-term viability.
- The organization has a relatively small sales and support staff, which may not scale, especially if outside of the select geographic regions where Nimbus Data currently has support.
- Nimbus Data lacks financial and organizational transparency and public references.

Pure Storage

Pure Storage has executed well on its vision of software-led solid-state arrays that leverage off-the-shelf cost-effective hardware components providing cost-effective SSAs. Through creative marketing programs and targeted competitive campaigns, it has managed to achieve high customer awareness and challenge the large storage behemoths by making it easy for customers to buy and own its products. This is a testament to Pure's mature and established FA-400 Series, which continues to deliver capable data management services and proven data reduction implementation while based on consumer-grade SSD technology. Pure has done this with an aggressive go-to-market channel strategy, and has maintained high customer satisfaction levels as it has scaled the business. Pure's culture and innovation has been able to attract high-quality personnel as it continues to expand across geographies. Gartner expects that Pure Storage will be publicly traded within the next 12 months.

Strengths

- Pure Storage demonstrates that it understands customer pain points through new creative pricing and guarantee programs around controller upgrades, SSD warranties and maintenance pricing.
- Pure is moving from being a software-orientated vendor using commodity SSDs to being more of a hardware-engineering organization that designs and tunes its own storage array subsystem.
- The vendor has gained customer trust by demonstrating it is reliable, stable and easy to work with.

Cautions

- As a privately held and fast-growing company, there continues to be lack of transparency around its financial metrics such as revenue growth, cash burn rate and profitability.
- The Pure Storage FA-400 series product has limited scalability when compared to competitive products.
- Given the rapid revenue growth that it is experiencing, Pure Storage has its task cut out in its ability to grow its workforce, while simultaneously preserving its core culture and practices as it proceeds toward an IPO.

SolidFire

SolidFire's initial focus was on technology companies and service providers offering high-performance infrastructure as a service (IaaS) and SaaS. Since early 2014, SolidFire increased its focus on enterprise customers through an OEM agreement (with Dell) and channel programs targeting multitenant private cloud workloads. Recent enhancements include competitive entry-level offerings (SF2405); Element X, a software-only version of the SolidFire product targeted at hyperscale customers; and ActiveIQ, a SaaS-based analytics and reporting platform that delivers proactive support and is available as part of a standard maintenance contract. In addition, SolidFire offers a platform compatibility guarantee, ensuring that all future software and hardware releases will interoperate with existing infrastructure. Customers are allowed to perform their own software and hardware upgrades, which shows a robust and resilient design. SolidFire also offers a competitive unlimited drive wear guarantee and simple, all-inclusive pricing.

Strengths

- SolidFire exhibits growing momentum in the enterprise segment through strong VMware and OpenStack integration, and through the introduction of cost-effective entry-level models, such as SF2405.
- SolidFire offers flexible deployment models that include all software-inclusive appliances, prevalidated reference architectures with technology partners, and a software-only option aimed at hyper-scale cloud providers.

- SolidFire's QoS, multitenancy, API-based storage automation and scale-out capabilities make it an attractive storage platform for diverse storage consolidation and private cloud workloads.

Cautions

- SolidFire's success in the market is predicated on rapid evolution of multitenant private clouds, which have been plagued by technology immaturity and cultural challenges in the enterprise.
- SolidFire's breadth of reference implementations, depth of ISV partnerships and strength of a presales team focused on enterprise workloads continue to trail competitors.
- SolidFire has limited sales, service and support personnel outside of the U.S., Japan, Korea, Singapore, Australia and Western Europe.

Tegile

Founded in 2010, Tegile is a relatively new entrant in the SSA market. Over a short period of time, it has achieved good market adoption of the T3800, which only became available in June 2014.

Customers should exploit Tegile's IntelliCare guarantees around price, availability and upgrades.

The Tegile T3600 through T3800 SSAs are built on the same platform as the hybrid T3100 through T3400 storage arrays, and, therefore, all have the same administration and configuration graphical user interfaces (GUIs). The reuse of the same proven software used in the hybrid arrays, and a ZFS-based architecture that has been optimized and rewritten, enables Tegile to offer a mature platform. Tegile provides list price and discount percentage transparency on its purchase offers.

Complementing this openness, it also includes all software features in the base price of the product; therefore, customers do not have to purchase extra licenses as they expand the array. Tegile sells its products via the channel rather than direct, and so far, this indirect go-to-market business model has been successful.

Strengths

- Tegile has a simple product portfolio, which leverages the same hardware, software and management GUI for all SSAs and hybrid storage arrays.
- Broad block and file protocol support makes Tegile one of the few unified SSA offerings.
- The vendor offers selectable data reduction, and detailed instrumentation and data reduction reporting on a storage pool and LUN level.

Cautions

- Tegile has limited market traction and presence outside North America and Western Europe.
- Tegile exhibits a lack of enterprise-focused channel partners and an overall limited market awareness.
- Extra products need to be purchased if synchronous replication is required; only asynchronous replication is available today.

Violin Memory

Violin Memory has traveled a turbulent path over the past few years, as a failed IPO precipitated a complete overhaul of the executive and sales teams. In early 2014, Violin Memory emerged under a new executive team that has endeavored to revitalize the company. Violin continues to leverage its component hardware approach, but it re-engineered a more resilient module on a more advanced flash memory process through its strong relationship with flash memory maker Toshiba.

Most importantly, Violin has promoted a more cohesive data management software approach that debuted in early 2015 in its 7300 and 7700 product lines. However, these are new to the market and have limited customer validation compared to the prior series. The advancements in data management software are based mostly upon optimization and redevelopment of intellectual property licensed from FalconStor. With a more comprehensive and integrated data management software suite, many existing customers have been carefully testing and delaying purchases to the detriment of Violin's customer revenue growth. Now that Violin is focusing aggressively on selling its more competitive 7000 series products, its success will be dependent upon the merits of its software and its ability to attract quality channel partners in order to achieve its revenue growth targets.

Strengths

- Violin Memory's purpose-built hardware delivers strong performance, density and a price that appeals to demanding customers for low-latency workloads.
- Violin Memory has demonstrated agility and resilience to accelerate both its hardware and software development efforts in order to swiftly integrate its data management software into its 7000 series.
- The vendor offers relatively fast product transition to a new product line, with more comprehensive software features in the Concerto operating system.

Cautions

- Violin Memory's software abilities and implementation need to be refined and improved for ease of use.
- The vendor has considerable concentration among a small group of customers, and while it has diversified over the past quarters, it still deserves to be monitored closely to ensure future company stability.
- Violin could be an acquisition target should its data management software not resonate well with existing customers, and if its financial and profitability targets are not achieved by 2016.

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

Fujitsu and Tegile

Dropped

Skyera was purchased by Western Digital in December 2014, but failed to meet our revenue inclusion criteria.

Inclusion and Exclusion Criteria

To be included in the Magic Quadrant for SSAs, a vendor must:

- Offer a self-contained, solid-state-only system that has a dedicated model name and model number (see Note 1).
- Have a solid-state-only system. It must be initially sold with 100% solid-state technology and cannot be reconfigured, expanded or upgraded at any point with any form of HDD within expansion trays via any vendor's special upgrade, specific customer customization or vendor product exclusion process into a hybrid or general-purpose SSD and HDD storage array.
- Sell its product as a stand-alone product, without the requirement to bundle it with other vendors' storage products in order to be implemented in production.
- The product and a service capability must be available in at least two of the following markets — Asia/Pacific, EMEA, North America and South America — via direct or channel sales. Availability does not include hybrid (SSD, HDD) storage arrays.
- Provide at least five references that Gartner can interview. There must be at least one client reference from Asia/Pacific, EMEA, North America and South America, or the two geographies within which the vendor has a presence.
- Provide an enterprise-class support and maintenance service, offering 24/7 customer support (including phone support). This can be provided via other service organizations or channel partners.
- Have established notable market presence as demonstrated by the amount of PBs sold, number of clients or significant revenue.

The SSAs evaluated in this research include scale-up, scale-out and unified storage architectures. Because these arrays have different availability characteristics, performance profiles, scalability, ecosystem support, pricing and warranties, they enable users to tailor solutions against operational needs, planned new application deployments, and forecast growth rates and asset management strategies.

While the SSA Magic Quadrant represents vendors whose dedicated systems meet our inclusion criteria, ultimately, it is the application workload that governs which solutions you should consider, regardless of any criteria.

Other vendors and products were considered for the Magic Quadrant but did not meet the inclusion criteria, despite offering SSD-only configuration options to existing products. These vendors and/or specific products may warrant investigation based on your application workload needs for their SSD-only offerings:

- American Megatrends (AMI) StorTrends 3600i
- Dell Compellent Storage solutions
- EMC VMAX
- Fusion-io ION (acquired by SanDisk)
- Hitachi Unified Storage (HUS) VM
- IBM DS8000
- NEC A5000
- NetApp FAS (excluding All-Flash FAS)
- Oracle ZFS
- X-IO ISE 800 Series

Evaluation Criteria

Ability to Execute

We analyze the vendor's capabilities across broad business functions. Vendors that have expanded their products across a wider range of use cases and applications, improved their service and support capabilities, and focused on improving mission-critical applications will be more highly rated in the Magic Quadrant analysis. Ability to Execute reflects the market conditions and, to a large degree, it is our analysis and interpretation of what we hear from the market. Our focus is assessing how a vendor participates in the day-to-day activities of the market.

Product or Service evaluates the capabilities of the products or solutions offered to the market. Key items to be considered for the SSA market are how well the products and/or services address enterprise use-case needs, the critical capabilities of the product (see "Critical Capabilities for Solid-State Arrays") and the breadth of product and/or solutions.

Overall Viability includes an assessment of the organization's financial health, the financial and practical success of the business unit, and the likelihood that the individual business unit will continue to invest in the product, offer the product and advance the state of the art in the organization's product portfolio.

Sales Execution/Pricing looks at 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 focuses on the vendor's capability 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 provider's history of responsiveness.

Marketing Execution reflects unaided awareness (that is, Gartner end users mentioned the vendor without being prompted) and a vendor's ability to be considered by the marketplace. Vendor references, Gartner inquiries and end-user client search analytics results are factored in as a demonstration of vendor awareness and interest.

Customer Experience looks at a vendor's capability to deal with postsales issues. Because of the specialized nature of the cloud storage market and the mission-critical nature of many of the storage environments, vendors are expected to escalate and respond to issues in a timely fashion with dedicated and specialized resources, and to have relevant detailed expertise. Another consideration is a vendor's ability to deal with increasing global demands. Additional support tools and programs are indications of a maturing approach to the market.

Operations considers 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.

Table 1. Ability to Execute Evaluation Criteria

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

Source: Gartner (June 2015)

Completeness of Vision

Completeness of Vision distills a vendor's view of the future, the direction of the market and the vendor's role in shaping that market. We expect the vendor's vision to be compatible with our view of the market's evolution. A vendor's vision of the evolution of the data center and the expanding role of SSAs are important criteria. In contrast with how we measure Ability to Execute criteria, the rating for Completeness of Vision is based on direct vendor interactions, and on our analysis of the vendor's view of the future.

Market Understanding looks at the technology provider's capability to understand buyers' needs, and to translate those needs into an evolving roadmap of products and services. Vendors must show the highest degree of vision, listen to and understand buyers' wants and needs, and can shape or enhance those wants and needs with their added vision.

Marketing Strategy relates to what vendor solution message is described, how that message is communicated, what vehicles are used to effectively deliver it, and how well the buying public resonates with and remembers the message. In a market where many vendors and/or products can sound the same, or sometimes not even be known, message differentiation and overall awareness are vital.

Sales Strategy considers 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 looks at a vendor's product roadmap and architecture, which we map against our view of enterprise requirements. We expect product direction to focus on catering to emerging enterprise use cases for solid-state arrays.

Business Model assesses a vendor's approach to the market. Does the vendor have an approach that enables it to scale the elements of its business (for example, development, sales/distribution and manufacturing) cost-effectively, from startup to maturity? Does the vendor understand how to leverage key assets to grow profitably? Can it gain additional revenue by charging separately for optional, high-value features? Other key attributes in this market are reflected in how the vendor uses partnerships to increase sales. The ability to build strong partnerships with a broad range of technology partners and associated system integrators demonstrates leadership.

Vertical/Industry Strategy measures the vendor's strategy to direct resources, skills and offerings to meet the specific needs of individual market segments, including vertical markets.

Innovation measures a vendor's ability to move the market into new solution areas, and to define and deliver new technologies. In the SSA market, innovation is key to meeting rapidly expanding requirements and to keeping ahead of new (and often more-agile) competitors.

Geographic Strategy measures the vendor's ability 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.

Table 2. Completeness of Vision Evaluation Criteria

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

Source: Gartner (June 2015)

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 all four major geographical regions, consistent financial performance and broad platform support.

Challengers

Vendors in the Challengers quadrant participate in the SSA market and execute 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 often excel by focusing on specific market or vertical segments that are generally underpenetrated by the larger SSA vendors. This quadrant may also include vendors that are ramping up their SSA efforts, or larger vendors having difficulty in developing and executing upon their vision.

Context

This Magic Quadrant represents vendors that sell into the enterprise end-user market with specific branded SSAs. An insatiable demand for storage also demands a more capable high-performance tier that can deliver low-latency storage more reliably in order to create tangible benefits. As high-performance storage demand explodes, it will require even more storage administration, emphasizing the perpetual need for storage efficiency, resiliency and manageability to counter this trend.

Market Overview

Demand for SSAs continues to exceed market expectations. A few customers are moving to all-flash and SSA data centers for primary storage when the data reduction ratio makes the SSA's capacity utilization competitive with HDD arrays or hybrid arrays. This high adoption rate is due not only to the hard requirements, such as increases in productivity, reduced environmental footprint and storage efficiency, but also to the desire for a new storage technology and its order-of-magnitude improvement in performance. Even though many do not need it, if the desire is sufficient, the need will be justified. From an empirical perspective, SSA success is also due to historic stagnation and inability of hard-disk-drive-based storage to increase performance in terms of latency compared to the increase in CPU performance. Similarly, the reduced latency of solid-state arrays has enabled the creation of data reduction features, which provide higher storage utilization rates, reduce writes and improve cost-effectiveness. The advent of these factors has led to the continuing high rate of adoption of SSAs, evidenced by the fact that the SSA market segment more than doubled in 2014 compared to 2013, with total market revenue for SSAs in 2014 totaling \$1.43 billion.

Due to commoditization, competition is increasing, which in turn accelerates the rate of change in the wider storage array market. Therefore, compared to previous years, larger changes are expected in the movement of vendors' positions within the Magic Quadrant. These changes, which level the playing field, are described in "Traditional Storage Vendors, Brands and Products Are No Longer Risk-Free." The majority of large established vendors have embraced the SSA market; and, specifically, HP, EMC and Pure Storage have successfully executed at more than the market rate in revenue terms. The smaller vendors, such as SolidFire and Kaminario, have also managed to keep up and execute well when using revenue as an indicator. Any vendor that has not kept up with a

100% growth rate must therefore be lacking in execution or other factors. Nevertheless, some established disk vendors that do not have specific SSA products are still selling their older disk-based arrays, which have been configured as hybrid arrays containing SSDs. While this method of leveraging existing array products reduces a vendor's development costs, it also excludes that vendor from the new SSA market, as customers cannot purchase all of the new features that SSAs offer. Other more subtle factors, such as improved customer choice, productivity, simpler and more transparent purchasing, and ownership costs are propelling this market to very high growth rates. For example, five-year SSD media guarantees, all-inclusive software licensing, and productivity—rather than engineering-oriented administration software are common characteristics within the SSA market. These are purchase terms that all customers should request. SSAs have matured to levels competitive with general-purpose storage arrays in all but for the highest scaling in raw capacity. Compared to 2014, the preferred connection protocol is still Fibre Channel: 61% of all SSAs attached to servers use Fibre Channel, and 14% use the iSCSI protocol. Network File System (NFS) and Common Internet File System (CIFS) attach are, therefore, still rarely used. Server virtualization, OLTP, and VDI are the top three SSA workloads (in that order), with analytics moving to fourth place this year.

Gartner Recommended Reading

Some documents may not be available as part of your current Gartner subscription.

"Traditional Storage Vendors, Brands and Products Are No Longer Risk-Free"

"Slow Storage Replication Requires the Redesign of Disaster Recovery Infrastructures"

"Critical Capabilities for Solid-State Arrays"

"Use SSDs Rather Than Disk Striping to Improve Storage Performance and Cut Costs"

"Market Share Analysis: SSDs and Solid-State Arrays, Worldwide, 2014"

"How Markets and Vendors Are Evaluated in Gartner Magic Quadrants"

Evidence

- More than 2,000 Gartner client inquiries in 2014 and 1H15
- Vendor interviews and product demonstrations in 2014 and 1H15
- Surveys of included vendors
- Customer reference surveys in 1H15
- Dedicated SSA market share process in 2013 and 2014
- Public information, such as U.S. Securities and Exchange Commission filings, press releases, vendor websites and community support forums

Note 1 Product Feature Qualification

Product features considered for inclusion must have been in general availability by 31 December 2014 to be considered in the vendors' product rating. New products lack sufficient market validation and references.

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.

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.

GARTNER HEADQUARTERS**Corporate Headquarters**

56 Top Gallant Road
Stamford, CT 06902-7700
USA
+1 203 964 0096

Regional Headquarters

AUSTRALIA
BRAZIL
JAPAN
UNITED KINGDOM

For a complete list of worldwide locations,
visit <http://www.gartner.com/technology/about.jsp>

© 2015 Gartner, Inc. and/or its affiliates. All rights reserved. Gartner is a registered trademark of Gartner, Inc. or its affiliates. This publication may not be reproduced or distributed in any form without Gartner's prior written permission. If you are authorized to access this publication, your use of it is subject to the [Usage Guidelines for Gartner Services](#) posted on gartner.com. The information contained in this publication has been obtained from sources believed to be reliable. Gartner disclaims all warranties as to the accuracy, completeness or adequacy of such information and shall have no liability for errors, omissions or inadequacies in such information. This publication consists of the opinions of Gartner's research organization and should not be construed as statements of fact. The opinions expressed herein are subject to change without notice. Although Gartner research may include a discussion of related legal issues, Gartner does not provide legal advice or services and its research should not be construed or used as such. Gartner is a public company, and its shareholders may include firms and funds that have financial interests in entities covered in Gartner research. Gartner's Board of Directors may include senior managers of these firms or funds. Gartner research is produced independently by its research organization without input or influence from these firms, funds or their managers. For further information on the independence and integrity of Gartner research, see "[Guiding Principles on Independence and Objectivity](#)."