Summary

Hyperscale providers are dominating the market for public cloud storage in terms of product innovation, scale and revenue. Customers should be wary of using providers that lack meaningful scale and global presence due to slow product innovation and the realistic possibility of service closure.

Strategic Planning Assumptions

By 2019, at least one-fourth of the vendors in this Magic Quadrant will have exited the cloud storage market.

Through 2020, 80% of cloud breaches will be due to customer misconfiguration, mismanaged credentials or insider theft, not cloud provider vulnerabilities.

Market Definition/Description

Public cloud storage is infrastructure as a service (IaaS) that provides block, file and/or object storage services delivered through various protocols. The services are stand-alone, but often used in conjunction with compute and other IaaS products. The services are priced based on capacity, data transfer and/or number of requests. The services provide on-demand storage capacity and self-provisioning. Stored data exists in a multitenant environment, and users access that data through the block, network and REST protocols provided by the services.

Magic Quadrant

Figure 1. Magic Quadrant for Public Cloud Storage Services, Worldwide
Vendor Strengths and Cautions

Alibaba

Locations: Asia/Pacific (Mainland China, Hong Kong, Singapore) and North America (U.S.)

Key storage services: Block storage, Object Storage Service, file storage (limited preview)

Alibaba is the largest digital commerce company in the world by revenue. Alibaba has been offering the Aliyun cloud service since 2011, with an initial focus on customers in China. In 2015, Alibaba expanded its cloud services presence by opening up new regions in Singapore and the U.S. It also announced a partnership with Meraas, a Dubai-based holding company, to expand into the Middle East.

Alibaba has introduced several new features in 2015, such as cross-region replication, solid-state drive (SSD)-backed volumes and virtual private cloud (VPC) support to keep its cloud service competitive relative to its peers. In addition to the storage services, Alibaba also
offers compute, content delivery network (CDN) and database services, as well as value-added packaged services such as multimedia transcoding and image processing. The majority of existing customers are Chinese technology companies that are looking for a low-cost IaaS platform for hosting their web applications.

STRENGTHS

Although a late entrant, Alibaba has committed large financial resources to its cloud division that have resulted in a regular cadence of new products and functionalities and expansion into newer geographies.

Alibaba’s storage pricing is simple and competitive, thanks to the huge scale of its e-commerce operations. It has initiated several price reductions in the past 12 months to its storage and network egress pricing.

Unlike other cloud providers, Alibaba doesn’t charge separately for phone support and bundles it as part of the base service.

CAUTIONS

Alibaba has a limited track record and mind share as a cloud provider among enterprise IT outside of China.

Most of Alibaba’s independent software vendor (ISV) and channel partners are local Chinese companies that have no presence outside China.

Alibaba’s storage services API has limited compatibility with the popular backup/recovery and archiving ISVs. In addition, it has limited support with cloud storage gateway vendors; instead, Alibaba promotes a cloud storage gateway from DT Dream, a company that it has invested in.

Amazon Web Services

Locations: North America (U.S.), South America (Brazil), EMEA (Ireland, Germany), Asia/Pacific (Australia, China, India, Japan, Singapore, South Korea)

Key storage services: Amazon Elastic Block Store (EBS; block storage), Amazon Elastic File System (EFS; file storage currently in preview), Amazon Glacier (archival object storage), Amazon Simple Storage Service (S3; multiple tiers of object storage)

Amazon Web Services (AWS) dominates the IaaS market and has the most comprehensive storage offerings. Amazon S3 is 1.6 times as large as all the other object storage services in this Magic Quadrant combined, as measured by amount of data stored. AWS’ storage offerings include various tiers of block and object storage services that span performance and durability across commensurate price tiers. AWS also offers its Elastic File System (EFS), a managed service with support for Network File System (NFS). This gives customers the ability to "lift and shift" applications to public cloud IaaS environments, but it is expensive relative to its other storage services. AWS has more insight than any other vendor on how customers use public cloud storage services at scale. This deep knowledge of customer usage and AWS' ability to both react to and build solutions ahead of the market forms the basis for its overall competitive strength. AWS customers benefit by using
a vendor that is often the first to offer new category-defining features and services. This was recently evidenced by AWS being the first to offer premium block and file storage on SSD (EBS provisioned IOPS [PIOPS], EFS), cold tiers of block and object storage (EBS Magnetic, Glacier) and an event-driven microplatform as a service (PaaS, AWS Lambda) that is well-integrated to its storage services.

**STRENGTHS**

The scale at which AWS operates its public cloud storage services dwarfs the other vendors in this Magic Quadrant. This results in customers using a provider with clear operational abilities, even if it isn't the least expensive option.

AWS has the most extensive public cloud storage services, including block, file and object interfaces designed to match a wide variety of workloads ranging from low-cost, lower-performance to higher-cost, higher-performance and options in between.

AWS’s storage services are well-integrated with each other and its other services such as Lambda, Amazon Elastic Compute Cloud (EC2), Amazon Elastic MapReduce (EMR), AWS Key Management Service (KMS) and AWS Import/Export Snowball, delivering compelling solutions spanning compute, storage, networking and security.

**CAUTIONS**

Retrieving a large amount of data from Amazon Glacier within a short window of time can result in high retrieval fees, but staging this request over time to avoid such high retrieval fees is exceedingly difficult and leads to much higher recovery time objective (RTO). Exporting data using Snowball results in high bandwidth charges even though no public network is used.

Pricing for various AWS storage services is complicated and thus difficult to understand and predict, particularly when request charges, IOPS, data transfer and throughput need to be considered to appropriately match workload characteristics to infrastructure.

Organizations can experience improved agility by using AWS, but this should be tempered with the fact that customers frequently overprovision compute and block storage resources that are not fully utilized, often negating the benefits of agility by increasing costs. AWS needs to improve its capabilities to help customers consume services more efficiently when using its platform.

**AT&T**

**Locations:** North America (U.S.), EMEA (U.K., the Netherlands)

**Key storage services:** Cloud Storage (object storage)

AT&T markets an object storage service based on storage products from EMC. Much of AT&T’s Cloud Storage service is based on EMC Atmos. New users of AT&T’s Cloud Storage consume storage on a service based on EMC’s Elastic Cloud Storage (ECS) product, the successor to Atmos. AT&T supports both the Atmos and Amazon S3 APIs, but in limited form. AT&T’s customers use commercial applications from vendors such as Commvault for enterprise backup and Syncplicity for enterprise file synchronization and sharing (EFSS).
Users can add metadata to objects that can trigger policies to control whether objects are protected locally or replicated across sites for a higher price per GB. AT&T’s Cloud Storage service is currently available as a self-provisioned service in multiple data centers in the U.S. and Western Europe.

STRENGTHS

AT&T has broad experience working with large-enterprise and U.S. government customers.

AT&T provides extensive networking functionality for its customers and for enterprises willing to leverage its Multiprotocol Label Switching (MPLS) network or 3G/4G infrastructure.

AT&T will negotiate terms with customers rather than enforcing standard click-through agreements presented to the user during the course of account creation and service provisioning.

CAUTIONS

AT&T recently shut down its public cloud compute offering. AT&T’s dependency on EMC and the dominance of the hyperscale vendors such as AWS and Microsoft create a difficult environment for a vendor with a single, undifferentiated, general-purpose cloud storage service.

AT&T neither develops nor operates its cloud storage service by itself. AT&T relies on EMC for storage software and hardware while relying on EMC’s Virtustream business unit for the ongoing operation of the service.

AT&T operates no identity and access management (IAM) services to secure its cloud storage service. Users are unable to grant or deny granular access to data by operation (list, read, create, delete, modify, and so on) and thus require granting wide-ranging permissions. AT&T Cloud Storage does not provide short-lived tokens, which results in applications needing hard-coded account credentials. Granting wide-ranging permissions and hard-coded account credentials in an application creates a risk that can lead to exposure.

Google

Locations: North America (two in the U.S.), EMEA (Belgium), Asia/Pacific (Taiwan)

Key storage services: Google Cloud Storage (object storage), persistent disk storage (block storage), Google Cloud Storage Nearline (archival object storage)

Google was a late entrant to the cloud storage market segment in 2010, although it has been a SaaS provider to small and midsize businesses for close to a decade. Google Cloud Platform’s storage services consist of object storage (available as standard and durable reduced availability tiers), persistent disk storage (block) and a long-term retention storage tier (Nearline). The object storage service is available as standard and reduced services that are differentiated by availability and performance rather than data durability. Google has expanded its workload focus across six key vertical industries in the past year — media and
entertainment, life sciences, retail, financial services, gaming and technology companies. Google emphasizes its technology leadership in building distributed systems, its global network, a strong commitment to open source, and low costs as key differentiators to customers.

**STRENGTHS**

Google has exceptional software engineering, large-scale infrastructure operation experience and a large financial war chest. These elements, along with a strong desire to be a viable public cloud contender, can make it a formidable competitor over time.

Google delivers compelling price/performance across its block and object storage tiers due to its software-defined networking (SDN) investments, strategically placed edge locations and low price per IOPS for its SSD-based block storage tier.

Google's data products such as BigQuery and Dataproc are highly scalable and well-integrated with its cloud storage services, and can enable a wide variety of batch and streaming analytical use cases.

**CAUTIONS**

Revenue from selling enterprise-focused IT products is secondary to Google's advertising business, and, as a result, Google lacks a compelling enterprise strategy because it currently does not have the sales, marketing, globalization, and partner ecosystem to make it broadly attractive as a strategic enterprise cloud IaaS provider.

Google storage is available in just four geographies (only two outside the U.S.), which may not meet the data residency requirements of many non-U.S. customers. Moreover, Google's data centers outside the U.S. aren't located in major countries with a large demand for cloud storage.

The ecosystem of ISV partners available in Google Cloud Launcher (marketplace) as well as certified ISVs are quite minimal when compared to its larger competitors, which limits potential use cases and makes "try and buy" decisions difficult.

**IBM (SoftLayer)**

**Locations:** North America (U.S., Canada, Mexico), South America (Brazil), EMEA (France, Germany, Italy, U.K., the Netherlands), Asia/Pacific (Australia, Hong Kong, India, Japan and Singapore)

**Key storage services:** Object storage, file storage, block storage

After the SoftLayer acquisition in 2013, IBM retired its SmartCloud Enterprise offering and has focused on expanding the cloud service portfolio, partner ecosystem and geographic reach of SoftLayer. SoftLayer offers block, file and object storage services on an on-demand basis. SoftLayer offers both basic and performance-oriented block and file storage tiers, which can be used in conjunction with its hosting and cloud IaaS offerings. The block storage service is internet Small Computer System (iSCSI)-based with integrated snapshots and replication, while the file service is Network File System (NFS)-based with similar data protection capabilities. SoftLayer's object storage service is underpinned by OpenStack.
Swift. In addition to the services rated in this Magic Quadrant, there are related noncloud services; SoftLayer offers dedicated QuantaStor appliances for block and file storage through a partnership with OS Nexus, and IBM has also begun to offer dedicated and multitenant virtual storage appliances hosted in SoftLayer, using products like Spectrum Accelerate (formerly XIV) and Spectrum Scale (formerly GPFS). SoftLayer has made strong investments in data centers across the globe in more than 15 regions, and provides technical support and documentation in more than eight languages.

**STRENGTHS**

SoftLayer provides flexibility and choice to customers through its dedicated and multitenant storage services that can be integrated with its bare-metal servers, virtual servers, and hosted appliances to enable diverse use cases.

SoftLayer's storage services are increasingly marketed and sold through the global sales channel of IBM and its partners, and IBM is increasingly hosting storage solutions in SoftLayer data centers.

Since the acquisition by IBM, SoftLayer has significantly expanded its global reach, with more than 15 data centers outside North America across key locations in Europe, South America and Asia/Pacific.

**CAUTIONS**

SoftLayer is one element of IBM's cloud storage portfolio, which is complex and undifferentiated. It has too many overlapping products, which causes confusion among customers. There are significant concerns regarding the long-term viability of SoftLayer's OpenStack Swift-based object storage offering that will be replaced by the new IBM Cloud Object Storage, which is based on the Cleversafe dsNet product. The new service is still being integrated into the rest of IBM's cloud platform.

Although it has been three years since the acquisition of SoftLayer, the adoption of its cloud storage services is still largely relegated to gaming and consumer-focused technology companies. The adoption among enterprise customers continues to be low due to product weaknesses and lack of focus.

SoftLayer's object storage service doesn't support cross-region replication and relies on customer-initiated writes instead, placing the burden of data protection on the user rather than the platform.

**Microsoft**

**Locations:** North America (U.S. and Canada), South America (Brazil), EMEA (Northern Europe), Asia/Pacific (Hong Kong, China, Singapore, Australia, Japan, India)

**Key storage services:** Object Storage (standard and archive blob storage), File Storage, Block Storage (standard and premium)

Microsoft is currently the most prominent competitor to AWS from the perspective of enterprise adoption. Most enterprise customers that are considering Microsoft Azure also evaluate AWS — even for workloads based on Windows. When customers choose Microsoft
Azure, their existing relationships with Microsoft and/or their channel partner play an important role. The Microsoft Azure storage offerings feature block, file and object storage services that address a wide range of workloads, but they are mostly behind AWS’s service capabilities, adoption and mind share. Microsoft's Azure File Storage service, currently the only public cloud-based managed service that supports server message block (SMB), is a widely used storage protocol that allows applications to be "lifted and shifted" to Azure. Customer references who use both Azure and AWS indicated that Microsoft possesses a higher degree of involvement in the customers' application architecture, business objectives and support issues among local Microsoft personnel compared to AWS. This results in a consultative approach by Microsoft to building and deploying applications using Azure's services.

**STRENGTHS**

Microsoft has a strong enterprise focus, a solid understanding of enterprises' needs, and the resources in place globally to serve them well.

Microsoft has been making a concerted, public effort to support non-Microsoft technologies, including Linux and iOS, using Azure's services, giving customers a wider array of choices than those just limited to Windows operating systems.

Application developers who use tools such as Microsoft Visual Studio and .NET will find a well-integrated experience from the perspective of developing and building to deploying and running applications on Azure.

**CAUTIONS**

Microsoft is an innovation laggard, trailing behind AWS in both breadth and depth of public cloud storage service offerings. This is most evident in limited classes of block and object storage services, but extends to management aspects such as life cycle policies for objects and IAM policy integration.

Porting an application to use Microsoft Azure's Blob storage service will require significant investment in an API whose adoption is a fraction of that of Amazon S3.

Microsoft claims a large number of regions where Azure is available, but not all storage services are available in each region.

**Oracle**

**Locations:** North America (U.S.), EMEA (U.K., the Netherlands)

**Key storage services:** Object storage, block storage

Oracle's first foray into the IaaS market was a general-purpose object storage service, but it has since expanded to also include a low-cost, tape-based object storage service focused on archival use cases. Oracle Cloud offers block storage for use with compute workloads such as databases and object storage services for unstructured data in two tiers: disk-based object storage and tape-based archival object storage. Oracle offers iSCSI to connect with block storage volumes and the OpenStack Swift protocol for use with its object storage services. Oracle Cloud's compatibility with OpenStack Swift employs proprietary
extensions to support unique aspects of its archive service offering, such as the ability to request that data be fetched from tape-based archival storage. Oracle Cloud also supports the Amazon S3 protocol, but this is currently only available to third-party integration partners.

**STRENGTHS**

Oracle’s deep knowledge of its own enterprise-focused applications gives it a unique ability to develop solutions tailored to deploying and operating those products in Oracle Cloud.

Oracle has shown a willingness to compete on price with the hyperscale providers, although its ability to sustain such prices in the long run is unproven.

Oracle Recovery Manager (RMAN) has native integration with Oracle Cloud storage services, making Oracle Database backup to the Oracle Cloud a seamless operation.

**CAUTIONS**

Oracle’s public cloud storage services are not ready for mainstream usage, and early adopters will find them to be lacking compared to the hyperscale vendors across many dimensions, including compatibility, usability, security and breadth of offerings.

Oracle is a late entrant to the market for public cloud storage services, and with a nascent offering, its negligible market penetration and small overall capacity accurately reflect this.

Oracle Cloud’s management, provisioning and onboarding processes are unduly complex and lack the finesse required for efficient operation of public cloud storage services.

**Rackspace**

**Locations:** U.S. (Midwest, East), EMEA (U.K.), Asia/Pacific (Australia, Hong Kong).

**Key storage services:** Cloud Files, Cloud Block Storage

In the past two years, Rackspace has shifted its focus to concentrate more on organizations that look for cloud-enabled managed hosting and those that seek a managed services approach to infrastructure management. While Rackspace is still committed to an OpenStack-based cloud environment, it has started offering managed services for AWS, Azure and for on-premises Red Hat OpenStack implementations. It is betting its future on being a managed service provider for any third-party cloud IaaS, with early investments in AWS and Microsoft Azure management. It has recently launched a new storage service focused on file-oriented workloads to complement its block and object storage service. However, besides this new service, there has been limited expansion into newer geographies as well as a dearth of announcements of new products and functionalities to its existing cloud portfolio.

**STRENGTHS**

Rackspace’s cloud storage offerings are based on open-source projects and use open API interfaces. These open (OpenStack) APIs are growing in appeal among technology firms and enterprise IT, making it easier for customers to architect an interoperable hybrid
cloud.

Gartner inquiries reveal a high degree of satisfaction with Rackspace's customer support, which is available in English, Spanish, Portuguese and Mandarin.

Customers that desire a white glove approach to cloud storage use cases can benefit from Rackspace's professional services, implementation and managed services offerings across its own cloud, as well as third-party cloud providers such as AWS and Microsoft.

CAUTIONS

Rackspace's support for AWS and Azure raises questions on the viability of its own cloud service offerings, given the limited market traction and lack of new feature releases in the past 12 months.

The total petabytes of data under management across its block and object storage services is quite modest when compared to its larger hyperscale competitors.

Rackspace neither provides native capabilities to replicate data across regions nor does it provide encryption keys for data at rest.

Vendors Added and Dropped

We review and adjust our inclusion criteria for Magic Quadrants as markets change. As a result of these adjustments, the mix of vendors in any Magic Quadrant may change over time. A vendor's appearance in a Magic Quadrant 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

**Alibaba.** Alibaba has begun selling block, file and object-based public cloud storage services outside of China, its main country of operation.

**Oracle.** Oracle has released a public cloud-based object storage service focused on archiving in multiple regions.

Dropped

**Verizon.** Verizon has exited the market for public cloud IaaS and no longer qualifies for this Magic Quadrant as a result.

Inclusion and Exclusion Criteria

**Inclusion Criteria**

This Magic Quadrant's inclusion criteria focuses on storage service providers that offer object-based storage services through a publicly defined API.

To be included in this Magic Quadrant, a vendor must meet the following minimum requirements:
Sell object-based cloud storage as a stand-alone service, without the requirement to use any managed services (including guest OS management), or to bundle it with managed hosting or compute services. The vendor may also sell a private, single-tenant version built on its architecture.

Offer RESTful APIs for data access and charge on a metered basis.

Offer self-provisioning with on-demand access and transparent capacity addition.

Offer definable data security, reliability and availability as part of an SLA with a minimum of 99.9% availability for the core object service.

Offer resilient and secure network capabilities, including optional dedicated and shared links.

Offer pay-as-you-go pricing for capacity, data transfer and/or requests at a granular level (for example, per gigabyte per month for capacity, per gigabyte transfer per month for bandwidth, per 1,000 HTTP requests).

Have an established global market presence with data center locations in at least two geographic regions (among North America, EMEA, Asia/Pacific and South America), as demonstrated by the amount of petabytes under management, and the number of clients or significant revenue attributable to object-based cloud storage service sales.

Have an object-based cloud storage offering that has been in general availability since 31 December 2015.

Offer consolidated billing and provide 24/7 customer support (including phone support).

Offer documented release notes.

**Vendors Considered but Not Included**

**Joyent** does not offer its cloud storage service in more than one region and therefore doesn't meet the inclusion criteria for this Magic Quadrant.

**CenturyLink** does not offer its cloud storage service in more than one region and therefore doesn't meet the inclusion criteria for this Magic Quadrant.

**NTT** does not offer its cloud storage service in more than one region and therefore doesn't meet the inclusion criteria for this Magic Quadrant.

**Seagate** no longer offers a public cloud storage service and therefore does not qualify for this Magic Quadrant.

**Evaluation Criteria**

**Ability to Execute**

We analyze the vendor's capabilities across broad business functions. We give high ratings to vendors that have expanded their products across a wide range of use cases and applications, improved their service and support capabilities, and focused on improving
enterprise applications. Ability to Execute reflects the market conditions and, to a large
degree, it is our analysis and interpretation of what we hear from clients and vendor
references. Our focus is assessing how a vendor participates in the day-to-day activities of
the market.

**Product or Service** — We evaluate the capabilities of the products or solutions offered to
the market. Key considerations for the cloud storage services market are how well the
products/services address enterprise use-case needs, the breadth of the products (in terms
of functional capabilities) and how well they scale. Specific characteristics considered
include:

- Breadth of storage services
- Depth and functionality of the various storage services
- Value-added services

**Overall Viability (Business Unit, Financial, Strategy, Organization)** — This is an
assessment of the organization's overall 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 and advance the state of the art in the organization's
product portfolio. Specific characteristics considered include:

- Profitability, revenue growth, investments and financial health

**Sales Execution/Pricing** — We evaluate a 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. Specific characteristics
considered include:

- Total number of paid customers
- Number of customers added during the past 12 months
- Petabytes under management, and object growth
- Go-to-market strategy
- Sales mix (direct versus indirect)
- Competitiveness and diversity of pricing options

**Market Responsiveness/Record** — This focuses on the vendor’s 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
provider's history of responsiveness. Specific characteristics considered include:

- New product launches during the past 12 months
- Product alignment to market needs
- Track record of new product success
**Customer Experience** — We evaluate a vendor’s ability to deal with postsales issues. Because of the specialized nature of the cloud storage market and the mission-critical nature of many storage environments, customers expect vendors 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. Specific characteristics considered include:

- Level of satisfaction based on reference checks and Gartner inquiries

**Operations** — We consider the ability of the organization to meet its goals and commitments. Factors include the quality of the organizational structure, such as skills, experiences, programs, systems and other vehicles that enable the organization to operate effectively and efficiently on an ongoing basis. Specific characteristics considered include:

- Commitment to the cloud business so far
- Organizational structure
- Scale of operations
- Track record
- Quality of presales and postsales teams
- Quality of professional services team

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<tr>
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<td>Product or Service</td>
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<td>Overall Viability</td>
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<td>Sales Execution/Pricing</td>
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<td>Operations</td>
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*Source: Gartner (July 2016)*

**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 Gartner's view of the market. A vendor's vision of the evolution of the data center and the expanding role of cloud storage services are important criteria. In contrast with how we measure Ability to Execute criteria, the ratings for Completeness of Vision are based on direct interactions with vendors.

**Market Understanding** — We evaluate a technology provider’s ability to understand buyers' needs, and to translate those needs into an evolving roadmap of 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 wants and needs with their added vision receive high ratings. Specific characteristics considered include:

- Long-term strategy and execution
- New product launches during the past 12 months
- Product alignment with market needs
- Ability to sustain a differentiated offering

**Sales Strategy** — This considers the vendor's strategy for selling products. Does it use 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? Specific characteristics considered include:

- Key strategies to grow market share
- Quality of direct sales force
- Quality of technology and channel partners
- Key positioning messages
- Marketing outreach programs and channels for delivering them

**Offering (Product) Strategy** — We evaluate 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 the public cloud. Specific technologies may include connectivity management, identity and access management (IAM), application enhancements, and emerging solutions for enterprise cloud storage deployment and related technologies. Specific characteristics considered include:

- Breadth of offerings spanning block, file and object storage services
- Integration with peripheral services

**Business Model** — This assesses a vendor’s approach to the market. Does the approach enable the vendor 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 of the
business model 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. Specific characteristics considered include:

- Profitability
- Revenue growth
- Adjacent offerings/services
- Viability of current execution strategy

**Vertical/Industry Strategy** — This measures the vendor's strategy to direct resources, skills and offerings to meet the specific needs of individual market segments, including vertical markets. Specific characteristics considered include:

- A diverse mix of customers (with an emphasis on enterprise customers)
- Vertical-specific offerings
- Industry-specific compliance adherence
- Industry-specific ISVs and channel partners

**Innovation** — This measures a vendor's ability to move the market into new solution areas, and to define and deliver new technologies. In the cloud storage service market, innovation is key to meeting rapidly expanding requirements and to keeping ahead of new (and often more-agile) competitors. Specific characteristics considered include:

- New services/functionalities during the past 12 months
- Track record of innovation so far
- Roadmap
- Ability to monetize the innovation

**Geographic Strategy** — We measure the vendor’s ability to direct resources, skills and offerings to meet the specific needs of geographies outside its headquarters or native geography, either directly or through partners, channels and subsidiaries as appropriate for that geography and market. Specific characteristics considered include:

- Percentage of revenue beyond the home market
- Global locations from where services are offered
- Presales/postsales teams beyond the home market
- Strength of global channel partners

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<td>Geographic Strategy</td>
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Source: Gartner (July 2016)

**Quadrant Descriptions**

**Leaders**

Public cloud storage leaders offer innovative storage offerings built on a scalable platform, with global data centers and established credibility as a business. Leaders thoroughly understand the needs of large-enterprise organizations, and can engage those organizations with services as effective as traditional on-premises storage solutions with competitive pricing. Leaders provide partnerships and/or vertical industry offerings that satisfy not only generic storage requirements, but also complete information management environments integrated with applications operating on-premises, in private clouds or on a public cloud.

**Challengers**

Challengers are well-positioned to serve current market needs. Their services are targeted at a particular set of use cases, and they have a successful track record. They may have significant market share, and are likely to have many reference customers. They make significant investments in the business, with long-term plans that may enable them to become market leaders. The scope of their short-term ambitions is not as broad.

**Visionaries**

Visionaries introduce products that challenge the status quo of the market. They may lead by pricing, product features or expansion into an underserved portion of the cloud storage market. Visionaries lack the Ability to Execute at the level of vendors in the Leaders quadrant. They are poised to improve their Ability to Execute in areas of financial health, customer base and a workforce that demonstrates high competence in the cloud storage service market.
Niche Players

Niche Players may be excellent providers for the use cases in which they specialize, but may not serve a broad range of use cases or have an ambitious roadmap. Some are relatively new entrants to this market, or have not yet gained significant market share. Some may have solid leadership positions in adjacent markets, but are still in the relatively early stages of developing capabilities in cloud storage IaaS.

Context

Public cloud storage poses unique challenges compared to enterprise data center equivalents. One of the most difficult challenges is moving data in and out of IaaS environments. Some vendors, such as AWS, have made significant efforts to support importing and exporting data using both physical devices (Snowball) and network connections (S3 Transfer Acceleration) using access points at the edge. But not all vendors provide such services and the export of data can be particularly challenging when time, bandwidth and dataset sizes are significant factors.

Gartner does not recommend that organizations simply select from vendors in the Leaders quadrant, but in the case of public cloud storage, there is significant risk in not selecting a vendor with massive scale, deep ability to address enterprise requirements and a positive outlook for longevity. Upheaval in the market for public cloud IaaS has seen enterprises needing to evacuate data from providers that are either suspending service altogether or otherwise scaling back their operations. That's not an enviable state to find yourself in as an enterprise.

There's another subtle aspect that enterprises should be wary of: the service provider that neither ceases nor reduces their operation in a publicly noticeable manner. These service providers are the ones that are most at risk for eventually shutting down. The telltale sign is a service provider that fails to innovate. It isn't able to deliver new features and services to address evolving market requirements because keeping up with AWS, Google and Microsoft is a herculean task. Recent examples of such innovation in this market include archive tiers of block and object storage and tight integration with compute and security services.

Delivering public cloud storage services involves more than just deploying an internet-accessible object storage platform available in a region or two. To make them useful, secure and cost-effective, such services need tight integration with compute and IAM, and they need to be operated at scale. Many of the vendors in this Magic Quadrant, even some of the larger ones, do not offer tight integration between their object storage services and IAM to securely support mobile clients.

Market Overview

Public cloud storage services provide block, file and/or object storage resources for use by applications and users. These services are fundamentally similar to platforms that are commonly found in enterprise data centers, but with significant differences focused on how the resources are provisioned, accessed and billed. Public cloud storage resources are provisioned in a fraction of the time of the enterprise data center and are more like metered
utilities in which users pay for what they provision and consume, rather than capitalized expenditures. Lastly, public cloud storage services expose programming interfaces that allow organizations to programmatically provision resources through automation tools and frameworks.

The use cases for public cloud storage are quite similar to those found in the enterprise data center. Block storage is typically used for databases, analytics and transactional workloads. File-based storage in the public cloud is accessible via NFS and SMB protocols and supports use cases such as analytics and file sharing. Object storage is less commonly found in enterprise data centers, but the use cases focused on large-scale, unstructured data remain consistent.

The vast majority of public cloud-based storage is associated with applications from within public cloud IaaS environments rather than from within enterprise data centers. A negligible amount of data in public cloud object storage platforms is generated by enterprise backup applications and cloud storage gateways, but those are often entry points for organizations that are just beginning to experience public cloud storage services.

AWS's dominance isn't limited to just market share, product innovation and revenue — it's also the mind share leader. This is no more evident than Amazon S3, a ubiquitous protocol.

**Amazon S3: The Lingua Franca of Object Storage**

The Amazon S3 protocol has emerged as the de facto standard in terms of object storage access. Vendors such as EMC, Google, IBM and Oracle have implemented S3 protocol compatibility, but Microsoft is a holdout for fear of joining the cavalcade of others that are now in AWS’ dominion. Microsoft’s hesitance is understandable, as AWS now controls portions of the product roadmaps for every storage vendor that implements S3 API compatibility. When AWS introduces new features in S3, the storage vendors must follow suit or lag behind.

The wide and organic adoption of a proprietary protocol governed by a single vendor ultimately isn’t positive for enterprises. In fact, AWS serves a diverse group of customers, and many of them are not enterprises. Enterprise requirements that are missing in the protocol may never get implemented if AWS, as the sole arbiter of the protocol, chooses not to implement the features in S3.

Many vendors have implemented their own unique, proprietary extensions to the S3 API, but these should be avoided unless the trade-offs are clearly understood (see "Beware of Amazon S3 and OpenStack Swift API Compatibility"). Rather than implementing unique extensions to the protocol, the group of vendors that implement S3 protocol compatibility should form a working group to decide on enterprise-focused features that are missing, then implement extensions to the protocol as an agreed-to specification whether or not AWS agrees to do the same.

An S3 API working group will require that competitors work together to give enterprises sorely missing features in S3 such as those focused on governance and compliance. The alternative to not working together is the possibility of a dystopian future where significant
amounts of enterprise data are stored using a protocol where the governing body consists of a single company that wields enormous power over everyone, both consumers and providers of the Amazon S3 protocol.

Evidence


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.
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