

Magic Quadrant for Cloud Infrastructure and Platform Services

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Enterprises have significantly accelerated their use of public CIPS providers as they seek to scale and become more agile in the postpandemic period. Major differences between the providers warrant careful consideration as I&O leaders make strategic cloud provider selections.

Market Definition/Description

Cloud computing is a style of computing in which scalable and elastic IT-enabled capabilities are delivered as a service using internet technologies. Gartner defines the cloud infrastructure and platform services (CIPS) market as standardized, highly automated offerings, in which infrastructure resources (e.g., compute, networking and storage) are complemented by integrated platform services. These include managed application, database and functions as-a-service offerings. The resources are scalable and elastic in near-real time and are metered by use. Self-service interfaces, including a web-based user interface (UI) and an API, are exposed directly to the customer. The resources may be single-tenant or multitenant, and can be hosted by a service provider or on-premises in the customer's data center.

The scope of the Magic Quadrant for CIPS includes infrastructure as a service (IaaS) and integrated platform as a service (PaaS) offerings. These include application PaaS (aPaaS), functions as a service (FaaS), database PaaS (dbPaaS), application developer PaaS (adPaaS) and industrialized distributed cloud offerings that are often deployed in enterprise data centers.

Magic Quadrant

Figure 1: Magic Quadrant for Cloud Infrastructure and Platform Services



Source: Gartner (July 2021)

Vendor Strengths and Cautions

Alibaba Cloud

Alibaba Cloud (also known as Aliyun in Chinese) is a Visionary in this Magic Quadrant. This Magic Quadrant evaluation is focused on Alibaba Cloud's international business, which is headquartered in Singapore, and our technical assessment was performed using the international service.

Alibaba Cloud is a good fit for cloud-first digital business workloads for customers that are based in China or Southeast Asia and wish to leverage Alibaba Cloud's technology to support their ecosystem or need to locate cloud infrastructure in China. Alibaba Cloud is focused on expanding its successes in Asia in addition to advancing database PaaS offerings.

Strengths

- **Regional leadership:** Alibaba Cloud continues to have a leadership position in China and surrounding countries in terms of market share and capabilities. The company is poised to be a favored regional provider in emerging cloud markets, such as those in Indonesia and Malaysia, given its local market understanding and ability to be a bridge to digital commerce.
- **Financial position:** Alibaba Cloud experienced impressive revenue gains over the past year and has recently become marginally profitable for the first time. Alibaba's go-to-market execution is driving steady growth in both China and Southeast Asia.
- **Digital channels:** Enterprises often view Alibaba Cloud as a pathway to digital transformation and commerce capabilities. This is based on Alibaba Cloud's big data and analytics capabilities and its parent company.

Cautions

- **Worldwide traction:** Alibaba Cloud's market share, though third worldwide, is mostly concentrated in China, and most of its customers are either headquartered in China or global businesses that need a local Chinese presence. The company has yet to have breakout success in markets outside of its home region and is unlikely to meaningfully penetrate such markets.
- **Regional competition:** Alibaba is facing significant competitive pressure from both established worldwide providers, such as Amazon Web Services (AWS) and Microsoft, and China-focused cloud providers, such as Tencent Cloud and Huawei, which are all vying for a share of a growing market. Further, Alibaba Cloud is caught between geopolitical tension that may be a concern for international clients considering Alibaba Cloud's offerings.
- **Transparency:** Alibaba Cloud is not as transparent nor predictable with respect to discounting relative to international competitors. Alibaba also still lacks an element of transparency from the perspective of technical details of service implementations.

Amazon Web Services

Amazon Web Services, a subsidiary of Amazon, is a Leader in this Magic Quadrant. AWS is focused on being a broad-based provider of IT services, ranging from cloud-native and edge to ERP and mission-critical workloads.

AWS's future focus is on attempting to own increasingly larger portions of the supply chain used to deliver cloud services to customers. Its operations are geographically diversified, and its clients tend to be early-stage startups to large enterprises.

Strengths

- **Engineering supply chain:** AWS is using its engineering prowess to deeply innovate in areas

such as AWS-designed CPUs that offer better price/performance relative to x86 counterparts for some workloads. Such investments in AWS-designed silicon give the company long-term supply chain and engineering advantages relative to all other providers in this market.

- **Large financial commitments:** AWS continues to outperform the market with respect to the size and frequency of large financial commitments that enterprises make to use the platform, and the company's continued market share leadership reflects as much.
- **Innovation leader:** AWS often sets the pace in the market for innovation, which guides the roadmaps of other CIPS providers. As the innovation leader, AWS has materially more mind share across a broad range of personas and customer types than all other providers.

Cautions

- **Challenging renewals:** Dozens of Gartner clients across multiple geographies have reported unexpected pressure from AWS sales, which has sharply accelerated over the past year, to increase annual spend commitments by 20% to renew existing contracts. Since these customers typically have significant dependence on the platform, they may feel as if they have limited recourse; however, the pressure to increase spend is not AWS's policy and will be eliminated if the customer escalates.
- **Offering complexity:** Discerning between the multitude of solutions, such as those related to containers, databases and data management, requires substantial technical skills in order to appreciate the differences between the offerings and make the appropriate choice. Many enterprises require third-party assistance as a result of the complexity.
- **Bare-bones offerings:** AWS's new services are often not ready for meaningful enterprise consumption for prolonged periods of time because these bare-bones offerings are matured in public. Further, the company's leadership position in IaaS and dbPaaS creates a misleading halo effect for other offerings, such as AWS Outposts, which has experienced modest traction to date.

Google

Google is a Leader in this Magic Quadrant. Google Cloud Platform (GCP) is strong in nearly all use cases and is slowly improving its edge capabilities. Google continues to invest in being a broad-based provider of IaaS and PaaS by expanding its capabilities as well as the size and reach of its go-to-market operations. Its operations are geographically diversified, and its clients tend to be startups to large enterprises.

Strengths

- **Revenue growth:** GCP's revenue growth over the past year was impressive, although it's

currently incurring losses. The company is winning business for its core competencies, such as data and analytics, but GCP is also gaining ground with traditional enterprise workloads such as SAP.

- **Growing enterprise mind share:** GCP is making gains in terms of mind share with enterprises. The company has seen steadily increased adoption and lands at the top of survey results when infrastructure leaders are asked about strategic cloud provider selection in the next few years.
- **Innovation velocity:** Google continues with impressive year-over-year improvements that see GCP close meaningful gaps with both AWS and Microsoft Azure in terms of CIPS capabilities and, in some cases, accelerate past them. For example, GCP has the most fully featured Kubernetes service of any provider in this market.

Cautions

- **Postsales satisfaction:** Some Gartner clients have a poor experience dealing with GCP after committing to use the platform. Much of this stems from the rapid growth of GCP and the organizational immaturity that results.
- **Limited incentives:** Google is currently attracting clients with aggressive pricing relative to its competition, but the discounting is likely to eventually taper off as the company continues to mature with respect to revenue and customers.
- **Financial losses:** GCP is the only CIPS provider with significant market share that currently operates at a financial loss. Further, GCP's success erodes Google's overall healthy gross margins, and the cloud division is a minor part of the parent company's overall revenue.

IBM

IBM is a Niche Player in this Magic Quadrant. IBM Cloud's operations are geographically diversified and mostly focused on lift-and-shift and extended enterprise use cases. Its clients tend to be large and midsize enterprises. IBM has an investment focus that includes hybrid cloud, regulated workloads and industry-focused cloud services.

Strengths

- **Corporate restructuring:** IBM is embarking on a divestiture that will see its managed IT services business spun off into a company called Kyndryl so that IBM can focus on higher-margin businesses such as IBM Cloud. This may enable IBM to commit necessary resources to IBM Cloud engineering efforts to further advance the offerings.
- **Regulated industries:** IBM Cloud is doubling down on regulated workloads and industries as a primary strategy. The company has a particularly long history serving clients with such complex challenges using high-touch approaches that some customers value.

- **Edge computing:** IBM has innovative efforts in edge computing with highly visible deployments such as the Mayflower Autonomous Ship project highlighting a pragmatic mix of open-source frameworks and technologies bolstered by IBM Cloud Satellite and Edge Application Manager.

Cautions

- **Market share:** IBM continues to trail the market in terms of both market share and capabilities. IBM has made noticeable year-over-year progress in terms of adding CIPS capabilities, but not at the rate that makes it competitive with its peers.
- **Competitive pressure:** IBM was early to invest significant time and resources into a vertical strategy with an initial focus on financial services and telco providers. However, these efforts risk being overshadowed by more agile competitors with greater market share, capabilities and reference customers.
- **Legacy perception:** Gartner clients view IBM as a provider of legacy technologies, and it is not often a consideration among shortlisted cloud providers as a result. Furthermore, some of IBM Cloud's efforts to court software developers through open-source initiatives have yet to produce results.

Microsoft

Microsoft is a Leader in this Magic Quadrant. Microsoft Azure is strong in all use cases, which include the extended cloud and edge computing. Azure is particularly well suited for Microsoft-centric organizations. Microsoft has an investment focus on making architectural improvements to the Azure platform and providing a broad range of enterprise-focused services. Its operations are geographically diversified, and its clients tend to be midsize and large enterprises.

Strengths

- **Broadly appealing:** Microsoft has the broadest sets of capabilities, covering a full range of enterprise IT needs from SaaS to PaaS and IaaS, compared to any provider in this market. From the perspective of IaaS and PaaS, Microsoft has compelling capabilities ranging from developer tooling such as Visual Studio and GitHub to public cloud services.
- **Enterprise relationships:** Enterprises often choose Azure because of the trust in Microsoft built over many years. Such strategic alignment with Microsoft gives Azure advantages across nearly every vertical market.
- **Data services adoption:** Microsoft Azure's forays in operational databases and big data solutions have been markedly successful over the past year. Azure's Cosmos DB and its joint offering with Databricks stand out in terms of customer adoption.

Cautions

- **Resiliency:** Microsoft has made concerted efforts to improve resiliency with critical services such as Azure Active Directory, but many Gartner clients remain concerned about the real-world impacts when such critical services are unavailable. Further, Microsoft continues to react slowly to the rollout of AZs with the likelihood that some regions will never be equipped with such resiliency capabilities. Services such as the Azure Kubernetes Service (AKS) continue to experience some outages, particularly in association with updates and maintenance events.
- **Commercial complexity:** Microsoft has very complex licensing and contracting, and a complex account management structure with uneven cloud skills in the field. Further, Microsoft sales pressures to grow overall account revenue prevent it from effectively deploying Azure to bring down a customer's total Microsoft costs.
- **Novel innovations:** Azure's novel innovations in the market for IaaS and PaaS relative to its competitors over the past year were substantially less appealing. Additionally, despite Microsoft Azure's beginnings as an application PaaS provider, Azure's product execution and adoption in this segment have been rather mixed.

Oracle

Oracle is a Niche Player in this Magic Quadrant. Oracle Cloud Infrastructure (OCI) is mainly focused on lift-and-shift, HPC and hybrid workloads, though OCI endeavors to have broad capabilities outside of Oracle-focused applications. Oracle is focused on expanding the worldwide geographies it serves with capabilities competitive to its more established peers.

Strengths

- **Market responsiveness:** Oracle continues an impressive year-over-year pace of innovation that brings it closer to the market leaders in terms of hyperscale cloud capabilities. Though Oracle is starting from a smaller base, OCI has added more capabilities on a percentage basis over the past year than any other provider in this market.
- **Critical infrastructure:** OCI now serves as the underlying cloud infrastructure for all of Oracle's PaaS and SaaS offerings, which demonstrates Oracle's commitment to the market and its bet on OCI.
- **Distributed cloud:** Oracle's strategy of providing distributed cloud capabilities is unique compared to all other providers in this market. Oracle Dedicated Region Cloud@Customer allows enterprises to deploy a private cloud region on-premises with full parity of the public OCI regions and may be operated disconnected from the internet.

Cautions

- **Nascent adoption:** Oracle's rapid pace of engineering over the past two years means that many of its capabilities are new and immature. Due to the composition of the OCI customer base, cloud-native capabilities are less likely to have been deeply exercised or widely adopted.
- **Polarizing presence:** Oracle remains a polarizing presence particularly among software developers and independent software vendors (ISVs) who do not view the company as a neutral provider. The negative sentiment with respect to Oracle prevents the company from having the same level of grassroots success and enthusiasm of the larger, more successful providers.
- **Lift-and-shift focus:** Most Gartner clients consider OCI mainly for lift and shift of Oracle-centric workloads rather than as a general-purpose provider for all workloads, despite OCI being capable of such. However, customers often expand their use cases over time, which raises the likelihood of exposing missing features and the deficiencies of OCI's limited ecosystem.

Tencent Cloud

Tencent Cloud is a Niche Player in this Magic Quadrant. Tencent Cloud is mainly focused on China, serving multinationals in China or Chinese multinationals expanding overseas. Tencent is investing in network capabilities to support the low latencies required for gaming workloads.

Strengths

- **Digital transformation:** Tencent Cloud is leveraging strengths in areas of social networking, digital marketing and gaming to enable digital transformation for companies delivering services in China.
- **Large deployments:** Tencent Cloud has established impactful hybrid-cloud deployments by supporting top financial services clients in China. Besides cloud-native technology, clients appreciate Tencent Cloud's ability to integrate existing infrastructure as long as it meets approved criteria.
- **Investments:** Tencent has the ability to invest billions of dollars in a wide spectrum, ranging from IaaS to artificial intelligence (AI) to distributed cloud. Tencent Cloud is also distinguished by being the only hyperscale cloud provider with a region in Russia and core infrastructure capabilities (compute, storage and networking), particularly networking.

Cautions

- **International presence:** One-third of Tencent's regions outside of mainland China are operated by a partner. Additionally, two-thirds of Tencent's total regions have only one availability zone.
- **Regional disparity:** Notable gaps exist between Tencent's China-focused regions and its international ones. Many key features are not available in the international regions, such as DevOps tooling and edge computing capabilities. Further, certain security services, such as its

web application firewall service, are only available in its Hong Kong region.

- **Narrow ecosystem:** Tencent Cloud has a developing ecosystem of managed service providers that are often required by enterprises to deliver professional services in order to adopt CIPS offerings. This is particularly true outside of China where Tencent Cloud has yet to establish relationships with the largest managed service providers (MSPs).

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

No vendors were added.

Dropped

No vendors were dropped.

Inclusion and Exclusion Criteria

For Gartner clients, Magic Quadrant and Critical Capabilities research identifies and then analyses the most relevant providers and their products in a market. Gartner uses by default an upper limit of 20 providers to support the identification of the most relevant providers in a market. On some specific occasions, the upper limit may be extended by Methodologies where the intended research value to our clients might otherwise be diminished. The inclusion criteria represent the specific attributes that analysts believe are necessary for inclusion in this research.

To qualify for inclusion, providers need the following.

Market participation. Providers must sell public cloud IaaS as a stand-alone service, without the requirement to use any managed services (including guest OS management) or to bundle it with managed hosting, application development, application maintenance or other forms of outsourcing. They may, optionally, also sell a private or hybrid offering that uses the same architecture but is single-tenant.

Market traction and momentum. Providers must be among the top global providers for the relevant segments (public and industrialized private cloud infrastructure and platform services, excluding small deployments of two or fewer virtual machines [VMs]). They must have ISO 27001-audited (or equivalent) data centers on at least three continents.

They must have at least one public cloud IaaS offering that meets the following criteria:

- If the offering has been generally available for more than three years: A minimum of \$1 billion in 2020 public cloud IaaS and PaaS (CIPS) revenue (excluding partner-operated and/or distributed/hybrid/private cloud infrastructure deployed outside of a cloud provider's data centers), excluding all managed and professional services. Additionally, \$250 mm of the CIPS contract revenue must come from outside of the country where greater than 50% of data centers are located.
- If the offering has been generally available for less than three years: A minimum of \$500 million in 2020 revenue, excluding all managed and professional services, as well as a growth rate of at least 50% exiting 2020.

Gartner required vendors to provide a written confirmation of achievement of the following requirements. The confirmation needed to be from an appropriate finance executive within their organization.

Business capabilities relevant to Gartner clients. Vendors must offer public cloud IaaS services globally (they must be purchasable outside their home region); be able to invoice and offer consolidated billing; and be willing to negotiate customized contracts. They must have 24/7 customer support (including phone support). There must be an option for English-language localization of the contract, service portal, documentation and support.

Technical capabilities relevant to Gartner clients. Vendors must have public cloud IaaS and PaaS services that are suitable for supporting mission-critical, large-scale production workloads, whether enterprise or cloud-native. Specific generally available, first-party service features must include:

- Software-defined compute, storage and networking, with access to a web services API for these capabilities
- Cloud software infrastructure services facilitating automated management, including, at a minimum, monitoring and autoscaling
- A managed database platform as a service offering
- A managed functions as a service offering with integrated HTTP API gateway platform whose underlying infrastructure is not exposed to the user
- Company developed, publicly available SDKs in three or more programming languages
- A distributed, continuously available control plane supporting a hyperscale architecture

- CI/CD offerings to support the complete application life cycle including automated build and deployments
- A distributed cloud offering as defined by Gartner
- Real-time provisioning for compute instances (small Linux VM in 5 minutes, 1,000 Linux VMs in 1 hour) and a container service that can provision Docker containers in seconds
- An allowable VM size of at least 16 vCPUs and 128 GB of RAM
- A service-level agreement for compute, with a minimum of 99.9% availability
- The ability to securely extend the customer's data center network into the cloud environment
- The ability to support multiple users and API keys, with role-based access control

Evaluation Criteria

Ability to Execute

Table 1: Ability to Execute Evaluation Criteria

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

<i>Evaluation Criteria</i> ↓	<i>Weighting</i> ↓
Operations	Medium

Source: Gartner (July 2021)

Completeness of Vision

Table 2: Completeness of Vision Evaluation Criteria

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

Source: Gartner (July 2021)

Quadrant Descriptions

Leaders

Leaders distinguish themselves by offering a service suitable for strategic adoption and having an ambitious roadmap. They can serve a broad range of use cases, although they do not excel in all areas, may not necessarily be the best providers for a specific need and may not serve some use cases at all. Leaders in this market have appreciable market share and many referenceable customers.

Challengers

Challengers are well-positioned to serve some current market needs. They deliver a good service that is targeted at a particular set of use cases, and they have a track record of successful delivery. However, they are not adapting to market challenges sufficiently quickly or do not have a broad scope of ambition.

Visionaries

Visionaries have an ambitious vision of the future and are making significant investments in the development of unique technologies. Their services are still emerging, and they have many capabilities in development that are not yet generally available. Although they may have many customers, they might not yet serve a broad range of use cases well or may have a limited geographic scope.

Niche Players

The Niche Players in the market for CIPS may be excellent providers for particular use cases or in regions in which they operate, but they should ultimately be viewed as specialist providers. They often do not serve a broad range of use cases well or have a broadly ambitious roadmap. Some may have solid leadership positions in markets adjacent to this market, but have developed only limited CIPS capabilities.

Context

On the surface, many of the providers in this Magic Quadrant appear alike. They all have, for example, virtual machines, managed container services and managed database PaaS offerings. The various pricing models are remarkably similar and often within comparable ranges, even when negotiated discounts are taken into account.

What's wholly different is below the surface – at the level of architecture, implementation and operations. The resiliency characteristics afforded to clients varies widely by provider. Major outages plagued several cloud providers in this Magic Quadrant over the past year. In some cases,

providers offered few capabilities to work around provider-oriented failure using accepted, modern means such as availability zones.

Strategic cloud provider selection necessitates that enterprises consider the failure scenarios by workload and architect to manage them. In some regions, with several providers in this Magic Quadrant, the challenge of working around provider-oriented failure is insurmountable.

Market Overview

The market for cloud infrastructure and platform services is consolidating, with over 90% of the worldwide market concentrated in just four cloud providers. Amazon Web Services and Microsoft lead the market with Alibaba and Google as the next closest competitors.

This consolidation shows no sign of slowing down. AWS and Microsoft continue to dominate in much of North America and Europe, where overall cloud growth rates remain strong. Alibaba is a dominant force in China and a formidable competitor in countries where China has influence.

However, the era of the Chinese service provider is just beginning. Providers such as Alibaba Cloud, Tencent, Huawei and Kingsoft are showing keen interest in competing, not just regionally within Asia but also in far-from-home regions such as Latin America, where the Chinese providers face a less hostile reception than in the Western world.

The worldwide consolidation is occurring largely as a result of enterprises seeking industrialized offerings that bring with them a level of dependability and a wide breadth of functionality to satisfy all enterprise workloads.

This is the key difference between a worldwide provider and a boutique regional provider that may have a virtualized offering consisting of compute, network and storage using off-the-shelf virtualization products. The boutique provider is simply unable to compete with the innovation speed of the worldwide providers.

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.

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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

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