



IDC MarketScape

IDC MarketScape: Worldwide Infrastructure as a Service 2017 Vendor Assessment

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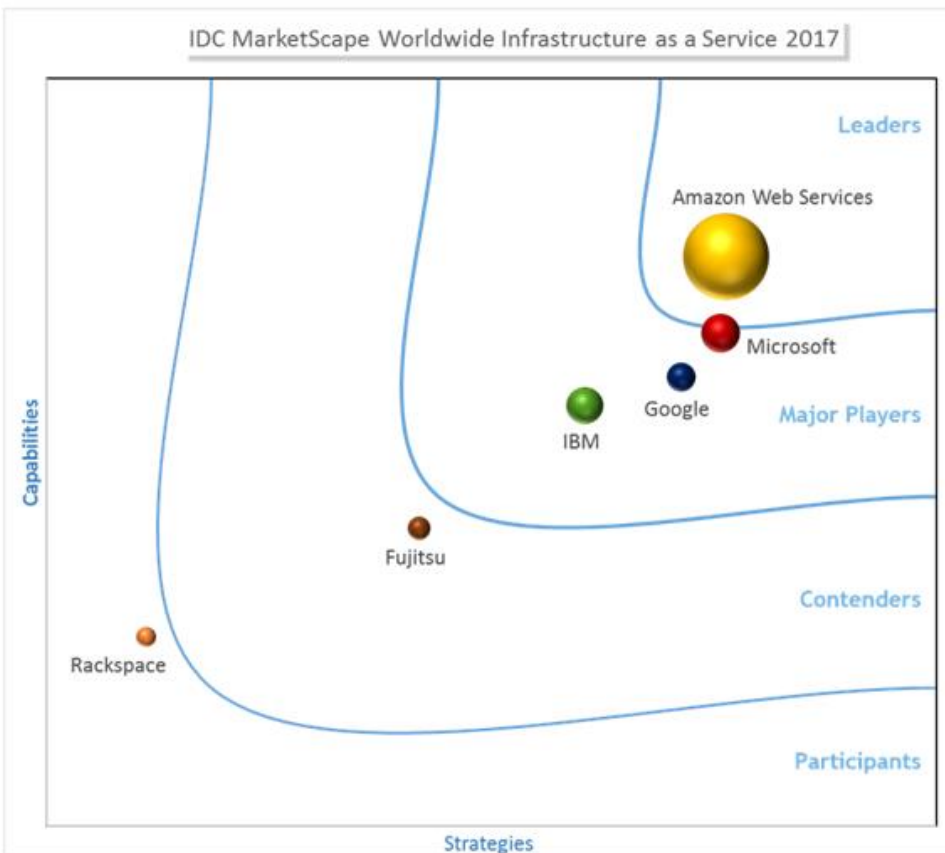
Erik Berggren

THIS IDC MARKETSCAPE EXCERPT FEATURES AMAZON

IDC MARKETSCAPE FIGURE

FIGURE 1

IDC MarketScape Worldwide Infrastructure as a Service Vendor Assessment



Source: IDC, 2017

Please see the Appendix for detailed methodology, market definition, and scoring criteria.

IN THIS EXCERPT

The content for this excerpt was taken directly from IDC MarketScape: Worldwide Infrastructure as a Service 2017 Vendor Assessment. Doc #US43073916). All or parts of the following sections are included in this excerpt: IDC Opinion, IDC MarketScape Vendor Inclusion Criteria, Essential Guidance, Vendor Summary Profile, Appendix and Learn More. Also included is Figure 1.

IDC OPINION

The growing acceptance and use of infrastructure as a service (IaaS) has transformed how users procure and manage compute and storage infrastructure. Over the past decade, we've seen growing acceptance among enterprise companies in running production and analytics workloads in public cloud IaaS supplementing earlier use cases of backup, disaster recovery, and archiving. This is not only for new applications but also for existing enterprise applications running on-premises, which are being migrated to public cloud IaaS. This has given rise to the use of managed services as well as the development of virtual machine and database migration tools to move workloads into popular public cloud platforms.

Consequentially the use of IaaS is displacing traditional on-premises computing and storage investments. Enterprises recognize that IaaS can enable faster time to market for new applications and bring up-front as well as operational cost reductions for existing applications. Among enterprises using IaaS, the top reasons behind initial adoption have been to reduce infrastructure capital cost and to allocate IT resources to strategic business growth objectives. This interest among enterprises has fueled a compounded growth of 34.6% in IaaS spending from 2013 to 2016. By way of comparison, the CAGR for spending on physical server and storage infrastructure during the same period was in the single digits.

The growing acceptance of the use of IaaS by enterprises has increased investments by providers in this market and increased competition, creating a growth in the number of public cloud IaaS providers. While Amazon Web Services (AWS) dominated the industry for many years, entrants such as Microsoft, Google, IBM, and regional providers that are expanding (Alibaba, Fujitsu) have given users more choice. AWS' early time-to-market advantage has allowed the company to define the market and continue to innovate, offering an ongoing stream of new features, functions, and services. However, this pace of innovation, combined with early market advantage and scale of operations, has stymied smaller new entrants.

The adoption of IaaS continues across the enterprise segment. However, its use is not without challenges. IDC research consistently shows that enterprises using IaaS already are challenged to meet cost, performance, and security requirements. Alongside that, the options available are increasing and each cloud provider continues to add differentiated new services on their platform. These fuel consideration across IaaS providers both for new workloads that are planned for the cloud and for redeployment of workloads currently deployed on one public cloud platform. The net usage of public cloud IaaS continues to grow. At the same time, a lot of the public cloud IaaS adoption has been ad hoc, and there is still a relatively low level of maturity across enterprise organizations on how to best adopt public cloud IaaS solutions – especially when it comes to using multiple public cloud platforms alongside their existing on-premises infrastructure. The companies that are doing this right are taking a long-term view with a strategically anchored foundation for the transition and clear long-term objectives and goals regarding needs and expectations from the public cloud platforms. Further,

they take a structured comprehensive approach to the transition, catering for skill set buildup, process evolution, and reinforcement of new frameworks. This need is accentuated with the dynamic landscape of vendor offerings constantly changing the market and opportunities for adopting cloud solutions.

IDC MARKETSCOPE VENDOR INCLUSION CRITERIA

IDC tracks in its Public Cloud Services Tracker over 30 global and regional cloud providers with IaaS services. Many of these service providers are focused on specific regions or have not reached a material revenue scale. This MarketScope focuses on global public cloud IaaS providers, which have reached a critical threshold of revenue. The inclusion criteria for service providers included in this IDC MarketScope are as follows:

- The service provider needed to generate over \$100 million in its IaaS business in 2016
- The service provider needed to offer IaaS services in multiple, global regions
- The service provider needed to offer both IaaS compute and storage services in 2016

IDC opted to exclude service providers with public cloud service that was in the process of a major transformation, since the evaluation would not be an accurate reflection of the service.

This IDC MarketScope was designed to focus on the top multiregion public cloud services worldwide and is not a comprehensive coverage of public cloud IaaS providers worldwide. Although not discussed in this IDC MarketScope – a number of other public cloud IaaS platforms continue to see rapid growth and adoption on a global basis. These include Oracle, which introduced its next-generation public cloud IaaS service last year, and Digital Ocean, which has managed to continue growth in a hyperscaler-dominated market and has now expanded to IaaS storage services. From a global perspective, other notable providers are Alibaba, which is expanding beyond China to other regions with the Alibaba Cloud; China Telecom in China; and Orange, which is expanding beyond Europe with its public cloud services.

ADVICE FOR TECHNOLOGY BUYERS

Today, over 70% of CIOs have a cloud-first strategy. This indicates a shift in stance – from public cloud being a novelty to a mainstream choice. To be successful with a cloud strategy, organizations must take a comprehensive approach to adoption. Today, IaaS is a major component of any enterprise cloud adoption strategy. Selecting what workloads to host in a public or private cloud is a major decision. Further selecting the right vendor for each workload is another complex decision. IDC has outlined a framework to help guide organizations to develop their cloud adoption strategy and implement it. The selection of workloads and vendors for IaaS is part of the second phase (design) of this framework. The five major steps are briefly described as follows:

- Define and align on the high-level goals of the cloud strategy. This is done by answering key questions such as:
 - Why should cloud solutions be adopted? What value are we seeking?
 - What business model should be used? Who are our stakeholders?
- Design the cloud architecture. There are three critical steps in this phase:

- First, take inventory of existing and expected future IT solutions (using a 24- to 36-month lens). A necessary and often painful step is to rationalize the portfolio.
- Second, make decisions for each workload on what should be replaced with a cloud solution (as well as what should not be) and with what kind of solution. (See *Infrastructure and Cloud: A Proactive Approach to Enterprise Cloud Strategies*, IDC #256595, June 2015.) In this phase, identify the long-term road map and requirements for each workload and business need.
- Third, select what vendors should be used for what workload. IDC recommends using this IDC MarketScape to align providers' strengths with customer needs around each workload.
- Implement the strategy:
 - In this phase, organizations develop an implementation plan, build the skill sets for the execution, and execute the plan.
 - Along the transition, organizations should measure and track costs and benefits through the effort. These will help in the ongoing review of platform performance.
- Implement ongoing operations, management, and review of the new multicloud environment:
 - The first and by far most critical and difficult issue is around talent management. New skills and processes are required. Organizations need to answer questions such as: How does moving to the cloud change the organization and its processes? Are more developers needed? What new tools are needed? Will new roles and responsibilities be required? How should obsolete skills be managed?
 - It's important to clearly define who in the organization is going to monitor and manage the use of cloud services and resources. To do so is often a full-time job. Further complicating this are distributed teams that use IaaS in separate silos versus in a standardized manner. The lack of a concerted effort can miss cost savings opportunities, such as volume discounting.
- Govern the cloud transition strategy and framing of the new IT strategy:
 - IDC has developed a framework for how to build a cloud governance structure (see *IDC PlanScape: Cloud Strategies – Governance for Your Cloud New World*, IDC #US41463615, July 2016). This involves managing the overall demand side for IT solutions that are driven by the overall organizational strategy, as it evolves with digital transformation, and managing the supply of IT between a myriad of cloud providers. It is critical to get clarity on who's making what decisions in the overall cloud transition strategy. For a comprehensive guidance to the different roles needed in the transition, see *Cloud Strategies: Needed Roles for the Different Phases of the Cloud Transition*, IDC #US41052315, March 2016.
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Public Cloud IaaS Is Not a Commoditized Offering

One area that consistently is a concern among enterprises is the best-fit use for IaaS based on existing application portfolios. Determining which workloads are the best candidates for IaaS is a common question followed quickly by an economic and operational analysis of the costs associated with running workloads in private versus public cloud infrastructure. Following this is the selection of the public cloud IaaS provider that best meets customers' needs.

Today, IaaS is far from a commoditized offering. While the core set of IaaS offerings is gradually coming together across top providers, cloud providers still differ in details of number and type of virtual

server and storage services they offer. They also vary by the additional services they offer in their respective public cloud ecosystems. By way of example, Table 1 provides a high-level comparison of the compute services and purchasing options offered by four major IaaS providers.

VENDOR SUMMARY PROFILE

This section briefly explains IDC's key observations resulting in a vendor's position in the IDC MarketScape. While every vendor is evaluated against each of the criteria outlined in the Appendix, the description here provides a qualitative summary of the vendor.

Amazon Web Services

Amazon Web Services (AWS) is positioned as a Leader in the IDC MarketScape for worldwide infrastructure-as-a-service providers.

As its position on Figure 1 shows, AWS has effectively defined and led the core offering portfolio in the public cloud IaaS market. Its leadership position has come from its first-mover advantage going back to 2006 and its sustained focus on expanding its ecosystem of services to meet customer needs. Across all its services, AWS has over 90 infrastructure services and a broad set of Amazon EC2 instance types. Since the beginning of 2016, AWS has accelerated its pace of regional expansion, with new regions introduced in Canada, the United States (Ohio), the United Kingdom (London), India (Mumbai), and South Korea (Seoul) and additional regions announced for China, France, Hong Kong, Sweden, and the United States. Complementing its regional expansion, AWS has continued functional expansion of its core IaaS portfolio and the AWS cloud ecosystem.

On the compute side, AWS has launched multiple new services in the past 12 months. These include the Amazon EC2 Elastic GPUs that allow customers to attach a GPU to an instance just like an EBS volume, to support use cases such as HPC, application streaming, and gaming. Conversely, on the lower end of the market, Amazon Lightsail bundles T2 instances, SSD storage, data transfer, DNS management, and static IP services for as low as \$5/month, targeting Virtual Private Server (VPS) use cases like websites, blogs, and web servers. AWS also continues to refresh its EC2 instance hardware. AWS' X1 instance uses Intel E7 Haswell 4 socket CPUs and AWS' new I/O instances leverage NVMe SSDs to provide as much as 4 times improvement in IOPS. With Moore's law not offering the same processor gains as in the past, AWS has leveraged hardware acceleration with F1 instance types to build FPGA-embedded instance types that can be programmed for specialized hardware acceleration by customers. The broader AWS compute portfolio includes Amazon's container services (Amazon EC2 Container Service and the Amazon EC2 Container Registry) and the AWS Serverless platform (comprising AWS Lambda and the AWS Step Functions orchestration service). These complement the Amazon EC2 instance portfolio, offering customers a rich set of core compute options for traditional and next-generation application architectures.

On the storage side, AWS offers a breadth of storage services, from the original Amazon S3 for object storage, to Amazon EBS for block volumes, to the recent Amazon EFS for elastic file storage in the cloud. AWS also offers devices and services to facilitate data and workload migration with Snowball, Snowball Edge, Snowmobile, gateways, and services for database migration. Snowball Edge provides compute and storage services in a 100TB device that sits on-premise. The Snowball Edge leverages AWS Greengrass, which is a software implementation embedding AWS Lambda functions and other integration capabilities with the AWS public cloud. It is unique, in being the first AWS compute offering that is designed for customer premises.

As noted in *Redefining Hybrid Infrastructure: Amazon Brings Cloud Innovations to the Edge* (IDC #US42055816, December 2016), the Snowball Edge signals the start of a new direction of growth for AWS IaaS offerings, focusing on computing and storage needs at customer premises. The general availability of the VMware Cloud on AWS further strengthens AWS' level of support for hybrid use cases – providing interoperability and integration across public and on-premises platforms across a wide range of use cases. AWS also continues to expand the ecosystem of services available to customers. These include value-added services available in the AWS cloud – such as the AWS Artificial Intelligence Suite, AWS Batch, and AWS Managed Services, as well as services to enable easy migration to the cloud – such as the AWS Database Migration Service, AWS Server Migration Service, and AWS Application Discovery Service. The continued innovation on core services and the ecosystem underscore the importance that AWS places on the public cloud market and its investments to maintain market leadership.

Strengths

AWS enjoys a strong market share in the public cloud IaaS market and continues to invest and expand capabilities for customers in this market (refer back to Figure 1). From an offering perspective, its strengths include its breadth of datacenters and regions and its ecosystem of services beyond just core compute and storage. For example, services such as EMR, Athena, Kinesis, RDS, and DynamoDB allow for greater use of AWS data. More recently, Amazon has already increased its focus on enabling enterprise customers to migrate existing workloads to EC2 via tools and services such as AWS workload migration tools and AWS managed services. The recent VMware Cloud on AWS release is another major step in this direction, giving AWS a strong value proposition for enterprises building out a hybrid infrastructure strategy for their internal IT.

Challenges

A common challenge AWS customers cite is the lack of visibility into increasing AWS costs. This is a challenge that AWS has sought to address with things such as Linked Accounts, consolidated billing, Trusted Advisor, and CloudWatch, although cost visibility or lack of predictable costs is still a challenge noted by enterprise customers. Another common challenge is the spread of options AWS offers, sometimes overwhelming newcomers to the cloud with the array of options.

Last, AWS will need to contend with the increased investment and focus by strong challengers such as Google and Microsoft. Both companies have been able to benefit from the early lessons and journey that AWS has gone through in this market, and both are enjoying strong market growth and customer adoption.

APPENDIX

Reading an IDC MarketScape Graph

For the purposes of this analysis, IDC divided potential key measures for success into two primary categories: capabilities and strategies.

Positioning on the y-axis reflects the vendor's current capabilities and menu of services and how well aligned the vendor is to customer needs. The capabilities category focuses on the capabilities of the company and product today, here and now. Under this category, IDC analysts will look at how well a vendor is building/delivering capabilities that enable it to execute its chosen strategy in the market.

Positioning on the x-axis, or strategies axis, indicates how well the vendor's future strategy aligns with what customers will require in three to five years. The strategies category focuses on high-level decisions and underlying assumptions about offerings, customer segments, and business and go-to-market plans for the next three to five years.

The size of the individual vendor markers in the IDC MarketScape represents the market share of each individual vendor within the specific market segment being assessed. In the case of the IDC MarketScape for IaaS, these have been tweaked for them to be easy to visualize – primarily because of the order of magnitude lead that the leader holds in this market.

IDC MarketScape Methodology

IDC MarketScape criteria selection, weightings, and vendor scores represent well-researched IDC judgment about the market and specific vendors. IDC analysts tailor the range of standard characteristics by which vendors are measured through structured discussions, surveys, and interviews with market leaders, participants, and end users. Market weightings are based on user interviews, buyer surveys, and the input of IDC experts in each market. IDC analysts' base individual vendor scores, and ultimately vendor positions on the IDC MarketScape, on detailed surveys and interviews with the vendors, publicly available information, and end-user experiences in an effort to provide an accurate and consistent assessment of each vendor's characteristics, behavior, and capability.

Market Definition

IDC defines cloud services through a checklist of key attributes that an offering must manifest to end users of the service. To qualify as a "cloud service," as defined by IDC, an offering must support all of the six attributes.

Cloud services may be deployed through a variety of deployment models. At the highest level, there are two types of deployment models for cloud services – public and private:

- Public cloud services are shared among unrelated enterprises and/or consumers, are open to a largely unrestricted universe of potential users, and are designed for a market, not a single enterprise.
- Private cloud services are shared within a single enterprise or extended enterprise, with restrictions on access and level of resource dedication, defined/controlled by the enterprise and beyond the control available in public cloud offerings.

In the public cloud world, we define one major model – the public cloud service. Underneath this big umbrella, there is a growing variety of options available, relating to public/private/VPN network connection, geolocation of data, options for dedicated data storage devices, and so forth. IDC considers these all "subspecies" within the public cloud world.

The public cloud IaaS market forecast also includes on-demand hosted private cloud (HPC). In this deployment model, SPs dynamically provision resources for dedicated use from a shared pool – often from the same pool as their public cloud offerings. Through cloud automation, SPs offer a procurement experience that is essentially the same as their public cloud offerings, with rapid self-service provisioning, ability to quickly scale resources up/down, flexible pricing, APIs, rapid enhancement cycles, and very short-term commitments (as short as minutes or hours). Examples include Amazon Web Services' Dedicated Instances and IBM-SoftLayer Bare Metal Servers. Because on-demand HPC services are emerging as an optional offering from public cloud services providers – delivered from the

same provisioning environment, using the same resources, and offering similar economics as fully shared public cloud services – we include on-demand hosted private cloud services in this study.

The IaaS primary market is further segmented into the following secondary markets – basic storage, servers, and network. With this approach, the functional definition (with inclusions/exclusions) of each cloud services segment is essentially the same as the functional definition found in IDC's traditional IT products taxonomies but delivered as cloud services.

Basic storage and servers include all server capacity and raw storage capacity, respectively, delivered as cloud services. Storage-related cloud services that are above and beyond raw storage – including backup, archiving, continuity, and data synchronization – are classified as advanced storage and categorized under system infrastructure software cloud services (a submarket of SaaS).

For more details about our cloud services taxonomy, check out *IDC's Worldwide IT Cloud Services Taxonomy, 2015* (IDC #258348, September 2015).

LEARN MORE

Related Research

- *Multicloud Infrastructure as a Service as a Public Cloud Adoption Pattern* (IDC #WC20160825, August 2016)
- *IDC PlanScape: Cloud Strategies - Governance for Your Cloud New World* (IDC #US41463615, July 2016)
- *Worldwide Public Cloud Infrastructure as a Service Forecast, 2016-2020* (IDC #US41556916, June 2016)
- *IDC PlanScape: Building the Business Case for the Cloud Transition Strategy* (IDC #US41154516, April 2016)
- *Cloud Strategies: Needed Roles for the Different Phases of the Cloud Transition* (IDC #US41052315, March 2016)
- *Infrastructure and Cloud: A Proactive Approach to Enterprise Cloud Strategies* (IDC #256595, June 2015)

Synopsis

This IDC study represents a vendor assessment of infrastructure as a service through the IDC MarketScape model. The ramp up of public cloud adoption by enterprises, accompanied by steady investment in expansion of cloud services by the market leaders, has broadened the range of public cloud ecosystems for the end customer. The shift in focus from prices to ecosystem is beneficial to both providers and customers, with public cloud providers investing in differentiated ecosystems and value-added services, and end customers selecting a mix of public cloud providers for their workloads.

"While core IaaS services are starting to look similar across the market leaders, this is still a fast-evolving market with continued innovations being introduced in both compute and storage portfolios. In addition, differentiation in the ecosystem of tools and higher-layer services will continue to be a strong way in which public cloud providers differentiate and position themselves in this market." said Deepak Mohan, research director, Public Cloud Infrastructure as a Service. "As enterprises look at the spectrum of options available, careful consideration of internal IT strategy, and detailed evaluation of provider portfolios, will maximize the benefits delivered to the enterprise through cloud adoption."

"With more and more choices stemming from increased competition between the major players in the cloud space, there are many good opportunities to capitalize from it. The winner here is clearly the customer. Organizations have the opportunity to leverage cloud solutions to increase their competitiveness both operationally and strategically. Leveraging IaaS solutions has its place in any cloud transition strategy. Companies should take a structured comprehensive approach when developing their cloud transition strategy," states Erik Berggren, VP, Cloud Strategies at IDC.

About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.

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