Cloud Infrastructure and Platform Services

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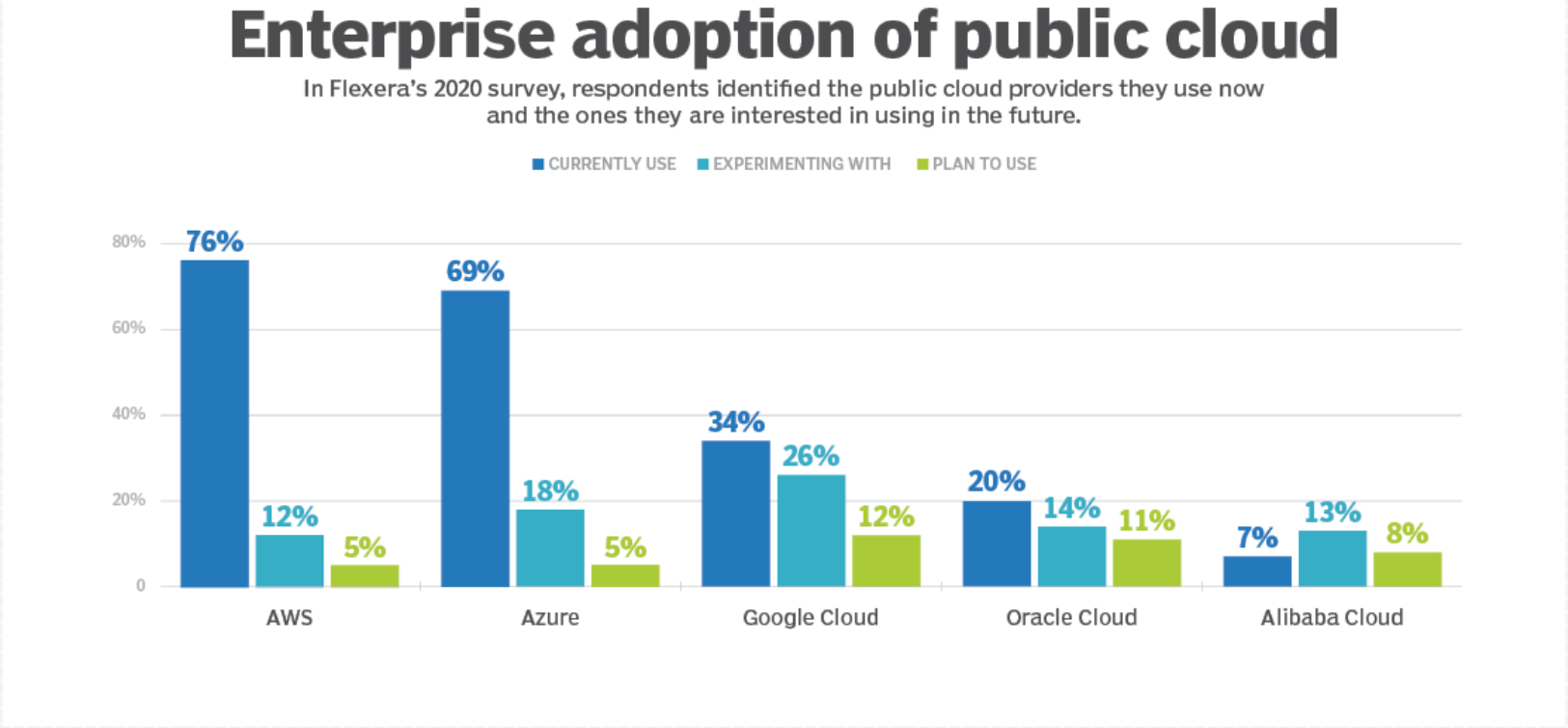
Cloud Providers in 2020/2021

- Spending on infrastructure as a service, or IaaS, in the first quarter of 2020 reached $29 billion, up 37% from Q1 the previous year
- During COVID-19 crisis emerged as one of the few industries that grew as a result of the pandemic. 76% of IT leaders increased their use of public and private cloud services specifically in response to the pandemic, and 45% plan to accelerate their cloud migration plans.
- The two leading public cloud providers are AWS and Microsoft Azure. A 2020 estimate pegged AWS' share of the cloud infrastructure services market at 32%, while Microsoft held 18%.
- In the second tranche of public cloud providers, Google Cloud Platform (GCP), Alibaba and Tencent continue to gather momentum and gain market share. These are joined by IBM, Oracle and Rackspace as the only companies with a measurable market share in cloud services.

Public Cloud Adoption



Cloud Providers locations in 2023

AWS (https://aws.amazon.com/es/about-aws/global-infrastructure/)

AZURE (https://azure.microsoft.com/en-us/global-infrastructure/geographies/#overview)

GCP (https://cloud.google.com/about/locations#regions)

Region: contains a set of data centers, often named by that geographical location, e.g. Northern California.

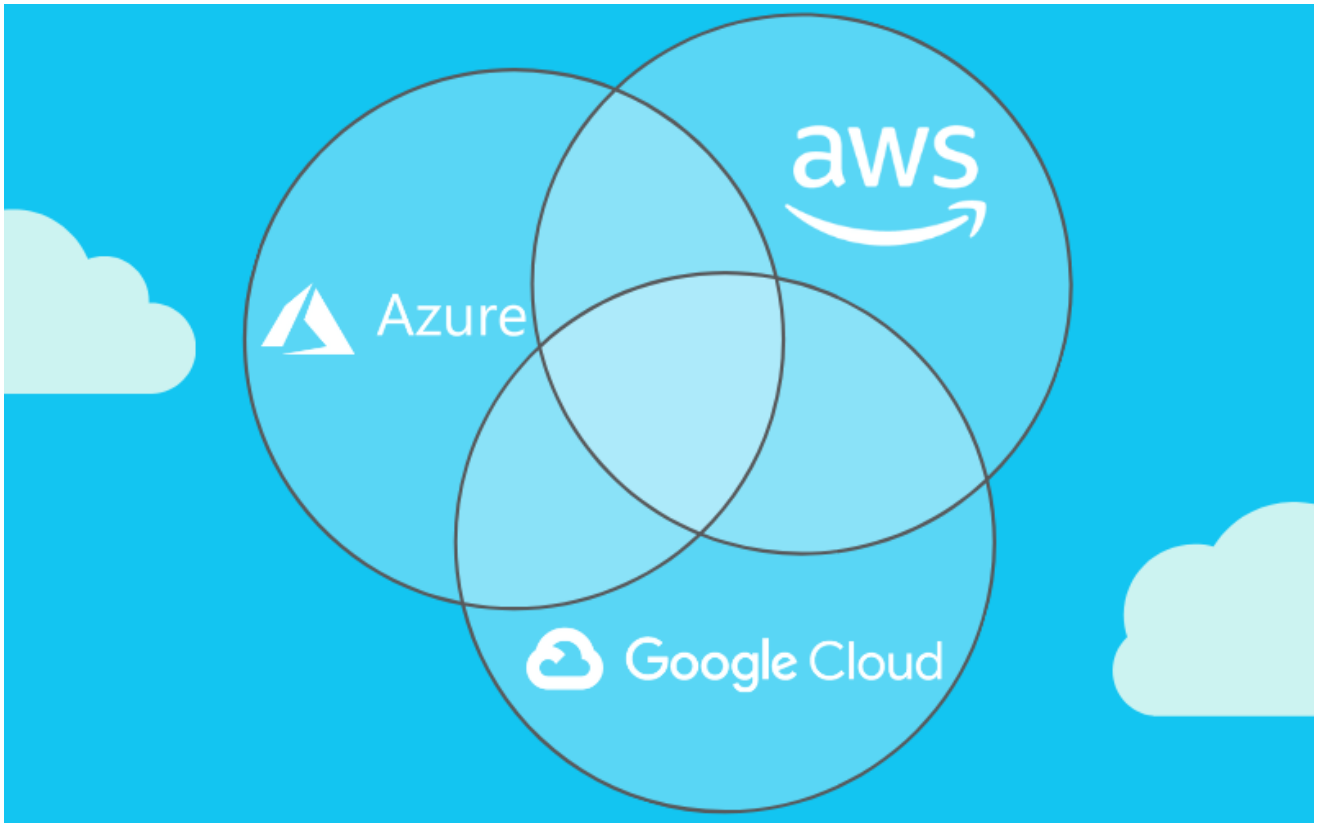
Availability Zone: is a physical construct. It's a set of data centers. It belongs inside a Region and is physically separated from data centers of a different AZ in the same Region.

Gartner Cloud Providers Comparison

- Information from:
  - Information from: Magic Quadrant for Cloud Infrastructure and Platform Services.https://www.gartner.com/en/documents/4004076. Published 27 July 2021.
  - Magic Quadrant for Cloud Infrastructure and Platform Services. Published 1 September 2020. https://www.gartner.com/en/documents/3989743/magic-quadrant-for-cloud-infrastructure-and-platform-ser
  - Magic Quadrant for Cloud Infrastructure and Platform Services. Published 1 September 2022. https://cloud.google.com/resources/gartner-cloud-infrastructure-and-platform-services-2022
- Magic Quadrant Methodology: https://www.gartner.com/en/research/methodologies/magic-quadrants-research
- The scope of the Magic Quadrant for . Cloud infrastructure and platform services (CIPS) includes IaaS and integrated platform as a service (PaaS) platforms

Magic Quadrant for Cloud Infrastructure and Platform Services

Cloud Provider Comparison



Amazon Web Services (AWS)

- Locations: 27 geographic regions with 87 availability zones (independent data centers). AWS groups its data centers into regions, most of which contain at least three availability zones (data centers). It has multiple regions across Japan and the U.S., in addition to regions in Bahrain, Canada, France, Germany, Ireland, the U.K., Australia, India, Italy, Singapore, South Africa, South Korea, Sweden and Brazil, as well as the Hong Kong market. It also has two regions dedicated to the U.S. federal government. There are two China regions, which require China-specific AWS accounts.

- Recommended Uses: AWS is a very strong performer in most Gartner use cases, and a strong candidate for hybrid cloud and edge use cases.

Amazon Web Services (AWS)

- Strengths
  - AWS has the largest share of the worldwide market in IaaS and database PaaS offerings.
  - AWS is an exceedingly well-run business from a financial perspective and generates more than 50% of the operating income for all of Amazon.
  - As the largest public cloud provider, AWS has access to the latest processor, network and storage technologies and aggressively introduces them to its customers. AWS also develops custom silicon such as its Nitro hardware, Graviton CPUs and Inferentia deep learning accelerators.

  - Podcast AWS Nitro: https://www.decisores.com/podcast/2-05-hardware-de-aws-sistema-nitro/

Amazon Web Services (AWS)

- Cautions
  - The organizational design of AWS that allows its developers to operate as semiautonomous units creates inconsistencies among products
  - Although the company regularly touts price reductions on select products, its complicated pricing models, immense portfolio and huge set of compute instances and options means many users overspend through poorly designed, non-optimized implementations.
  - AWS lagged Google and Microsoft to provide managed Kubernetes services in preference to its homegrown Elastic Container Service product. AWS once again embraced the broader industry trend toward cloud-neutral Kubernetes, but many developers remain cautious about the company's embrace-and-extend tendencies toward open source projects.

Google Cloud Platform (GCP)

- Locations: Google has multiple regions across Japan and the U.S., as well as a presence in Belgium, Singapore, Finland, Germany, the Netherlands, the U.K., India, Australia, Brazil, Canada and, Switzerland, as well as the Hong Kong and Taiwan markets.

- Recommended Uses: Google has evolved by enhancing its strengths and attacking its limitations to providing a strong offering in every use case, other than the edge use case. Google has a future focus on building out hybrid capabilities and partnerships with telco providers.

Google Cloud Platform (GCP)

- Strengths
  - GCP's portfolio is particularly strong in services for managed container infrastructure, data analytics and AI
  - Google's open-source contributions, such as Kubernetes and TensorFlow, have been market-moving innovations that have changed the course of enterprise IT
  - Gartner clients continue to associate GCP with its big data and data science capabilities, stemming from the use of services such BigQuery and Dataproc. However, the company is pressing into new territory with Anthos (Kubernetes), GCP's container and Kubernetes-based middleware layer, designed to support the development and deployment of cloud apps in a hybrid and multicloud model
  - GCP is among the first to introduce new CPU, GPU and custom processors (such as the Google-designed TPU AI accelerator) to its services.
  - GCP is also noteworthy for its simpler pricing models with per-second granularity, automation discounts for sustained use, decoupled pricing for CPU and memory usage and custom instance types.

Google Cloud Platform (GCP)

- Cautions
  - GCP lacks enterprise-focused aPaaS capabilities and support for Oracle, and it continues to struggle with having an enterprise mindset in the field.
  - From a financial perspective, GCP's revenue is a small fraction of overall Google revenue and GCP's criticality to the overall business is not as clear as its competitors
  - Google's much-vaunted network capabilities have been the source of a number of GCP outages during the last years, with devastating impact on customers

Microsoft Azure

- Locations: its facilities span more than 50 regions (some with multiple availability zones). Microsoft calls Azure data center locations “regions.” There are multiple Azure regions in the U.S., Canada, the U.K., Germany, France, Australia, India, Norway, the UAE, Switzerland, Japan, Korea and South Africa. There are also regions in Ireland, Italy, the Netherlands, Singapore and Brazil, as well as the Hong Kong market and six regions for the U.S. federal government (two of which are dedicated to the U.S. Department of Defense).

- Recommended Uses: Microsoft is strong in all use cases. This includes the extended cloud and edge computing use cases, where many of the other vendors struggle. 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.

Microsoft Azure

- Strengths
  - While AWS has a few PaaS offerings, Azure has a much richer selection of application platforms via the App Service products
  - Microsoft Azure offers a complete end-to-end set of solutions related to a broad range of workloads and applications. This is evident from Microsoft Azure's partnerships with Oracle, SAP and VMware, continues with Azure's capabilities with respect to containers.
  - Microsoft leads the hyperscale cloud providers in terms of market share in the application developer PaaS segment with its suite of tools that include Azure DevOps, Github and Microsoft's Visual Studio Codespaces.
  - Azure's hybrid cloud strategy extends to IoT implementations where IoT Edge can manage remote devices, IoT Hub acts as a device management and data collection interface and Azure Sphere provides hardware and OS security.

Microsoft Azure

- Cautions
  - Microsoft has the lowest ratio of availability zones to regions of any vendor in this Magic Quadrant, and a limited set of services support the availability zone model. As a result, Gartner continues to have concerns related to the overall architecture and implementation of Azure, despite resilience-focused engineering efforts and improved service availability metrics during the past year.
  - Microsoft does not provide any form of guaranteed capacity to customers; even prepaid agreements and reserved instances are not capacity guarantees.
  - Microsoft's Unified Support can be very expensive, especially for those customers who have not historically had support services covering their entire Microsoft portfolio.

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