CNMC Public Consultation on Cloud Services
Microsoft Response 21 June 2024

1. Introduction

Microsoft appreciates the opportunity afforded by the CNMC to provide comments on its Public Consultation on Cloud Services ("Consultation") in Spain. The Consultation is timely. The cloud services industry today is dynamic, with growing demand and an ever-increasing number of new offerings and providers. It offers customers a new choice to decide whether to rely on their own computing infrastructure, or move to the public cloud if it offers better functionality at a more attractive price. The cloud enables organisations to reimagine their businesses, automate processes, scale capacity, and create new growth opportunities. Access to the leading-edge technologies and computing power available in the cloud is important for organisations large and small to innovate quickly, increase efficiency, accelerate productivity, and compete. Going forward, legislators, regulators and other policymakers should adopt policies designed to ensure that Spanish and more broadly EU enterprises, public sector organisations, and non-profit entities have access to and can choose the best cloud computing technology.

Microsoft's response to the Consultation is structured as follows:

- Section 2 outlines Microsoft's "Assessment of the market's functioning (Section 2 of the Consultation)

- Section 3 outlines Microsoft's comments barriers, migration, interoperability and commercial terms (Section 3 of the Consultation)

2. Landscape of cloud computing in Spain and more broadly the EU

a. Growth and innovation in cloud services offerings

Cloud services are growing rapidly with constant innovation and overall lowering of prices over time.[1] For example, Gartner estimated that in the IaaS segment alone, worldwide growth was over 25 percent in 2023.[2] Amazon Web Services ("AWS") remains the worldwide leader with roughly 40 percent share depending on which services are considered.[3] Along with AWS, Microsoft Azure, and Google Cloud Platform (GCP) are currently the other largest suppliers of cloud services. Each invest billions of Euro each quarter in building new datacenters, expanding networking infrastructure and developing new cloud services.

The Consultation roughly classifies cloud services by service models: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS). As discussed below, while these categories can be helpful conceptual tools to analyse competition in cloud services, they can be an oversimplification and do not necessarily reflect how suppliers or customers approach solutions in the cloud. These models simply describe the division of responsibility or control between the customer and the cloud services provider — a dynamic that the customer controls by choosing which services it will rely upon and picking and choosing among them whether they are notionally IaaS or PaaS. A SaaS solution must be built on server hardware and be supported by platform software, but those may be assembled in a highly integrated and optimised architecture not amenable to disaggregation or switching out of the underlying "layers." Moreover, the customer of a SaaS solution, by definition, has no access to the underlying infrastructure or platform software; he or she only experiences the finished application. Indeed, a provider of a SaaS solution can elect to offer it from their own datacenters, like Dropbox for example,[4] or build their solution on an existing public cloud like Netflix[5] as an example.

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[1] *See* https://appdevelopermagazine.com/why-the-cost-of-cloud-computing-is-dropping-dramatically/; https://journal.uptimeinstitute.com/cloud-generations-drive-down-prices/.

[2] Gartner Forecasts Worldwide Public Cloud End-User Spending to Surpass $675 Billion in 2024

[3] Gartner Says Worldwide IaaS Public Cloud Services Revenue Grew 30% in 2022, Exceeding $100 Billion for the First Time.

[4] Dropbox mostly quits Amazon cloud, takes back 500 PB of data – Computerworld

[5] Netflix is run on AWS. Netflix Case Study (amazon.com)

In analysing competition in cloud services, looking at IaaS and PaaS solutions on the one hand and SaaS solutions on the other can be helpful primarily because there are important differences in the features of a SaaS service as opposed to infrastructure and platform services. Indeed, IaaS and PaaS are primarily sold on a consumption (or pay-as-you-go) basis and used by developers to create their own cloud-based apps and solution for their own internal or external use. "Public cloud" providers typically provide services that span IaaS and PaaS. There are, however, also numerous third-party providers of cloud solutions that offer their own services that they make available on different public clouds for use by developers to create their own cloud powered solutions.

In contrast, cloud services that fall into the SaaS category, whether offered by the provider of the underlying hardware infrastructure or built on infrastructure controlled by a third-party, are primarily offered on a subscription basis per user. They are used by consumers or organisations and provide complete ready-to-use application functionality. The differences in business models, use cases, and customers between IaaS / PaaS and SaaS also means that even where a provider offers all services in both categories, the customer demand and corresponding sales motion is entirely different between IaaS/Paas and SaaS.

At the same time, these categorisations are merely tools to help understand the types of cloud services that are developed and should not themselves be considered as relevant markets. Nor do they enable consistent delineations between different services. Customers look to the public cloud to complete certain tasks or workloads, using the combination of cloud services that best meet their needs. This might not necessarily be an "IaaS" offering or "PaaS" offering. In fact, for many services the distinctions will be blurred with no meaningful and consistent way to distinguish between IaaS or PaaS. For example, Azure customers commonly provision a virtual machine (VM) with a certain amount of memory, storage, and compute power running either Linux or Windows Server. This is often a single stock keeping unit (SKU), but it is not totally clear whether the provisioning of a Windows VM falls in the IaaS category, because the user is buying compute power, or falls in the PaaS category, because the SKU includes an operating system in the VM. Similarly, storage is generally considered to be IaaS, but there are many solutions for managing the storage of data, such as a data warehouse offer from a company like Snowflake.[6] Snowflake data cloud offers a SQL data warehouse, which would likely be considered in the PaaS

[6] https://www.snowflake.com/data-cloud-glossary/data-warehousing/.

category. In sum, the distinction between IaaS and PaaS is blurry and customers look to the public cloud to find the best solution to address their needs irrespective of strict categorisation.

b. Providers of cloud computing services

As mentioned above, AWS is the market share leader for cloud services, followed by Microsoft Azure and GCP which both also operate at large scale. That said, the needs and demands of cloud customers vary widely. We do not expect that any one or even three public clouds will be the only entities to meet these needs in the future. In fact, other firms are also competing, innovating, and growing today or are poised for entry. For example, Oracle is aggressively growing its infrastructure cloud business, competing for customers worldwide.[7] IBM too offers a full stack of public cloud services with a focus on enabling hybrid cloud deployments and AI services.[8] And there are a variety of relatively smaller but successful cloud providers. For instance, OVH Cloud, with 43 datacenters around the world, is a very successful EU based cloud provider.[9] And, of course, there are thousands of providers of different cloud services that are offered as hosted solutions on infrastructure in datacenters offered by third-parties such as Amazon, Microsoft, Google, IBM, and others. Cloud providers continue to grow at extremely healthy double digit growth rates.

c. Factors that customers consider in choosing public cloud services

While different organisations will all approach their decision on whether to move the cloud and with whom slightly differently, most cloud customers will look a similar set of factors. Potential customers will have to consider factors including their respective budget and financial resources, procurement processes, geographic footprints (local, regional, or international), legacy IT infrastructure, and access to skills and capabilities. In addition, customers come from different industries and this also impacts what specific cloud services they need as well as dictates requirements in the form of minimum compliance, privacy and security standards. It is therefore, difficult to generalise with certainty which factors matter most to customers when choosing cloud providers.

In our experience in addition to price, many customers take into consideration at least the following additional factors:

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[7] *See, e.g* Oracle Cloud Has Achieved Momentum Through Differentiation (forbes.com).

[8] *See* https://www.ibm.com/cloud/products.

[9] OVHcloud Locations: Worldwide Datacenter Presence | OVHcloud UK

- **Scalability.** Scalability refers to the ability of a system to handle increased load, i.e., can a cloud provider scale services automatically to match demand, ensuring capacity during workload peaks and returning to normal automatically when the peak drops. Different customers will have different needs for scalability.[10]

- **Resiliency.** Resiliency is a system's ability to recover from failures and continue to function. It's not only about avoiding failures but also involves responding to failures in a way that minimizes downtime or data loss. Different customers will have different needs for resiliency.[11]

- **Sustainability.** Cloud migration can help customers meet sustainability goals. As pressure builds for greater progress on such goals, we expect that customers will increasingly consider the environmental impact of different cloud providers when choosing among them.[12]

- **Compliance.** Many customers need cloud services providers that comply with national, regional, and industry-specific requirements governing the collection and use of data.[13]

- **Security.** Cybersecurity is a paramount concern for almost all cloud services customers.[14]

- **Privacy.** Many customers want to be able to control their data and where it is located as well as ensure that their cloud services provider meets applicable privacy laws and standards such as GDPR. For some customers the availability of independent audits may be relevant.[15]

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[10] For more information *see* https://learn.microsoft.com/en-us/azure/architecture/framework/scalability/design-scale.

[11] For more information *see* https://learn.microsoft.com/en-us/azure/availability-zones/overview.

[12] For more information *see* https://www.microsoft.com/en-us/sustainability/azure.

[13] For more information *see* https://learn.microsoft.com/en-us/azure/compliance/ and https://azure.microsoft.com/en-us/explore/trusted-cloud/.

[14] For more information *see id.*

[15] For more information *see id.*

d. Public procurement of cloud services.

The procurement of cloud services by Spain's public administrations poses unique challenges. Cloud services qualify as a "supply" under Spanish public procurement law[16] and are subject to centralized purchasing by the Spanish government[17].

For SaaS offerings, the dynamic acquisition system SDA 25/2022 has been a successful procurement mechanism. It provides the agility required by public entities to acquire SaaS services, while maintaining an open process that allows new suppliers to participate.

However, for IaaS/PaaS offerings, there is no similarly agile procurement mechanism. Although the Spanish government has repeatedly announced its intention to approve a framework agreement for these services, such an agreement has yet to materialize. In our view, a dynamic acquisition system (*sistema dinámico de adquisición*) would be preferrable to a framework agreement (*acuerdo marco*), because a dynamic system (like SDA 25) would allow new suppliers to join, hence fostering competition during the dynamic system's term, while a framework agreement may limit competition by foreclose the number of potential suppliers.

3. New entry and expansion in the cloud is happening and interoperability and commercial terms enable cloud switching and multicloud deployments.

a. Entry and Expansion

Because cloud services generally benefit from economies of scale, Microsoft acknowledges that entering from scratch as a new public cloud provider can be challenging. This does not mean, however, that entry is unachievable or that the actual or potential entry is not an important competitive constraint. With respect to entry and potential competition, there are many different potential entrants. There are at scale public cloud services offered by Alibaba, Tencent and Huawei which primarily operate outside of the UK.[18] They are well poised to expand into the

[16] See Informe 13/2021, Junta Consultiva de Contratación Pública del Estado, in line with Article 16.3(b) LCSP.

[17] See «Nota sobre sobre calificación jurídica de los servicios en la nube y su contratación centralizada», October 5, 2021, Dirección General de Racionalización y Centralización de la Contratación.

[18] Alibaba's AliCloud includes a datacenter in London, UK, since 2018. *See* https://www.alibabacloud.com/global-locations#:~:text=Data%20Centers%20Around%20the%20World%201%20Asia%20Pacific,1%20%28Tokyo%29%20Availability%20Zone%3A%202%20...%20More%20items.

EU in light of their existing global network of datacenters and their expansive and mature IaaS and PaaS offerings. The emergence of AI based workloads has led to new entry by organizations such as GMI Cloud, which specializes in enabling access to GPUs for AI workloads in their cloud.[19]

Another potential scenario for entry is by large well-resourced organisations, which have an incentive to develop an at-scale cloud for their own use and then open it up to deliver services to others. There are many well-resourced providers who fall into this category, e.g., Facebook, Salesforce, and Apple that all run their own massive datacenters to power their popular offerings. The scale of their own operations would enable entry into the IaaS and PaaS segment. This has already been proven by the entry and expansion of Amazon when it leveraged the data centers that powered Amazon's retail marketplace to first introduce AWS and Google that has been able to leverage its datacenters for search to enter with GCP.

In addition, the ability to run software on-premises or develop a private cloud exercises a competitive constraint on public cloud providers. Customers need not move their computing workloads to the public cloud. They have choice and complete control. Moreover, firms can and do choose to use both internal and external solutions and shift workloads and/or solutions between them. For example, Walmart has developed a private cloud and at the same time uses public cloud services from GCP and Microsoft Azure.[20] Customers will use public cloud services only if they are more attractive than their on-premises or private cloud solutions. Since the main customers of the public cloud are sophisticated developers, they can also create their IT solutions with a potential to be able to switch or with contractual guarantees that ensure such a transition remains an economically viable option in the future.

b. Switching and multi-homing, enabled in part by interoperability and flexible commercial terms, are common place in the cloud

Switching costs between cloud providers depend on the nature of the solution and are largely in the customer's control. Unlike consumer products, the customers of cloud services are typically sophisticated organisations with developers with specialised knowledge making purchase decisions, which enables the customer to make well-informed choices with a clear understanding of the trade-offs involved in optimising workloads to reduce the costs of migration. This may

[19] Introducing GMI Cloud: New On-Demand Instances Accelerate Access to NVIDIA GPUs | Business Wire

[20] https://www.techtarget.com/searchcloudcomputing/news/252522631/Walmarts-multi-cloud-strategy-cuts-millions-in-IT-costs.

involve customers obtaining cloud solutions from multiple suppliers, and using technical solutions that allow mixing-and-matching between the different suppliers' offerings.

Open-source technologies, like Kubernetes containers, are prevalent and interoperable across public clouds and give customers confidence that if they build their solutions using such services, they will be able to migrate their workloads to other public clouds. In addition, commercial first- and third-party PaaS services have emerged that facilitate multi-cloud usage and migration. As an illustration, Microsoft created Azure Arc to enable customers to manage, govern, and secure workloads deployed across on-premises, multi-cloud, and in edge environments from a single place. Another example is Snowflake, a popular third-party cloud computing service, which offers a data platform on all major clouds, including AWS, Azure, and GCP. Customers using Snowflake can easily move and access their data across those clouds.[21] Snowflake explains that it "*ported [its] software by building a cloud-agnostic layer, abstracting the specificity of the underlying cloud infrastructure. This means any application running on Snowflake Cloud Data Platform is also cloud agnostic. This aspect is very important since avoiding any cloud lock-in is one of the key benefits of using Snowflake*."[22] Indeed, many providers are offering solutions across multiple clouds to enable better multi-cloud strategies.[23] These solutions show there are interoperability solutions that support substitution by shifting services between clouds and switching to new solutions, whether that means switching an existing workload or selecting a different provider for future cloud based workloads. Indeed, for each incremental workload or solution, customers can choose which cloud provider to use (or whether to deploy on-premises or in a private cloud). Cloud computing customers are not confined to using one cloud provider for all their needs, and they do not.

The Flexera 2023 State of the Cloud Report confirms that multi-cloud is the de facto standard and reported more than 89 percent of respondents said they're incorporating multiple clouds.[24] As

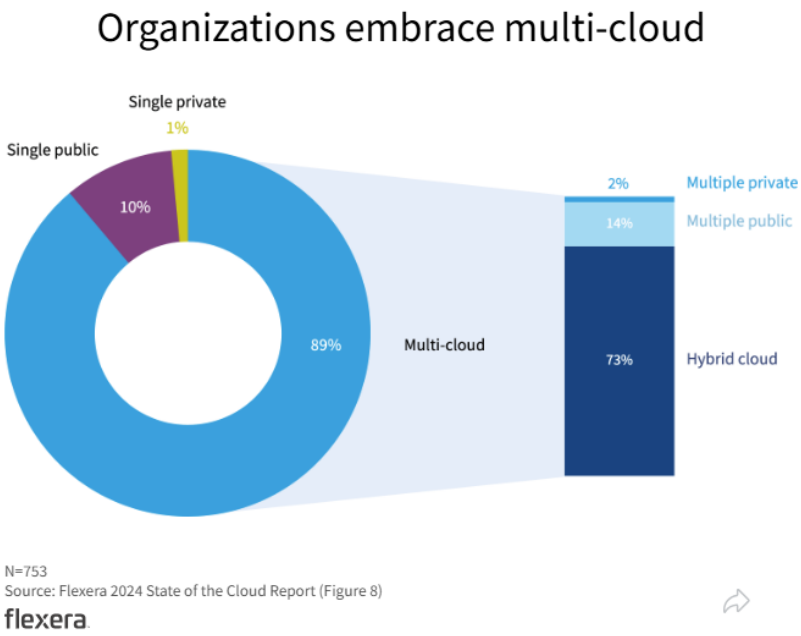
[21] Of course there are many other ways to move data across clouds as well. Use of a common database structure across multiple clouds can be helpful, but could also be done with solutions like MySQL or other well understood solutions.

[22] https://www.snowflake.com/blog/how-snowflake-delivers-a-single-data-experience-across-multiple-clouds-and-regions/

[23] *See* for example the Enterprise Monitoring Tools from Datadog that enable monitoring infrastructure across clouds and on premises and that works across many major clouds. https://www.datadoghq.com/enterprise-monitoring-tools/.

[24] 2024 State of the Cloud Report | Flexera

the figure below shows, customers choose to use multiple cloud providers for a variety of scenarios.



b. Commercial terms enable switching and multicloud.

Unlike on-premises traditional IT deployments, where customers have to invest in hardware and software upfront and incur ongoing maintenance costs, cloud computing allows customers to pay only for what they use and scale up or down as needed. This means that customers are not locked in by sunk costs or long-term contracts, and they can easily switch providers or use multiple providers simultaneously to optimize their performance, costs, and security. For example, Microsoft offers Azure on a pay-as-you-go basis, with no termination fees or upfront commitments, and customers can cancel at any time. Microsoft also provides various tools and resources to help customers estimate and manage their cloud spending, such as Azure pricing calculator, Azure cost management, and Azure advisor.

It is also common within the cloud sector for customers to negotiate longer term agreements with cloud providers that provide them with price certainty and potentially discounts. Often times these discounts will be based on a total spend commitment by the customer over a period of time. This structure provides the customer with pricing certainty and discounts and the cloud provider with commitments for future usage that the cloud provider can use in its

own financial and infrastructure planning. However, even in these cases, the agreements are not exclusive and customers can and do decide on a workload by workload basis the cloud on which they wish to deploy. And, because of interoperability between clouds and the prevalence of multicloud architectures, customers can use this strategy to ensure that they are not locked in to any particular cloud provider. Cloud provides than compete to win the next workload, help customers to deploy and even help with migrations from one cloud to another. For example, Microsoft provides Azure Migrate, a comprehensive service that helps customers assess, migrate, and optimize their workloads from on-premises or other clouds to Azure, with minimal downtime and risk. Azure Migrate supports various migration scenarios, such as server migration, database migration, web app migration, and data box migration. Other cloud providers provide similar tools.

c. Conclusion

Microsoft looks forward to cooperating with the CNMC on its Consultation and in particular on the important issues relating to cloud computing outlined above. The benefits and flexibility brought about by the cloud have helped transform the technology sector. Ensuring a vibrant and competitive cloud industry is critical to the future of the digital sector in Spain, the EU, and the world.