

In what capacity or on whose behalf are you participating in this public consultation?	Cloud service provider (also includes providers of cloud infrastructure, independent software providers and intermediaries)
In case of representing a company, please specify the type of company:	Large company
Full name (of the participant or represented institution):	Amazon Web Services
Do you wish to make your name publicly available with your answer or keep it confidential (in which case it will be published as an anonymous answer)?	Public
Contact email (will remain confidential)	[CONFIDENTIAL]
1. In your opinion, what will be the main factors that will drive the growth of the sector in the coming years? (max. 300 words).	<p>1.1 Competition to provide on-demand IT services as an additional, lower cost solution to meet customers' IT needs is and, for the foreseeable future, will keep increasing. There is fierce competition among larger and smaller cloud services providers. There have also been new entrants such as Akamai, Oracle, Snowflake, Alicloud, and Databricks in recent years. AWS predicts that this rate of entry and growth, as well as the trend of constant innovation, disruption, and fierce competition, will continue in the coming years as more customers consider cloud as an alternative to their on-premises solutions. In addition, increasing customer demand for, and usage of, artificial intelligence ("AI") has accelerated demand for compute capacity.</p> <p>1.2 While the offer for on-demand IT services has grown rapidly since AWS launched, competition from on-premises providers also continues to be fierce. The vast majority of customers continue to use on-premises IT solutions of the like of those offered by major providers like IBM, Dell, HPE, and Cisco, or co-located or managed services offered by a broad array of providers, including Equinix, NetApp, and Digital Realty. The choice to use cloud, on-premises or hybrid services is made at the customer workload level and depends on a variety of factors, such as customer needs, concerns about security and latency or the existing IT architecture of the customer. Even with respect to demand for compute capacity for AI, cloud is only one of myriad choices for customers as they can use on-premises solutions, solutions deployed in a co-located environment, online solutions provided by cloud services providers, or hybrid solutions combining these options.</p>
2. How would you classify the different types of agents/operators involved in the cloud market value chain? (max. 300 words).	<p>2.1 The cloud services value chain is typically comprised of at least the following operators:</p> <ul style="list-style-type: none"> (a) Cloud services providers, which provide access to computing resources on demand via a network; (b) Original Equipment Manufacturers ("OEMs"), who provide third-party maintenance contracts and support services for the procurement of network equipment to cloud services providers; (c) Independent Software Vendors ("ISVs"), which are organisations that develop, maintain, and sell software, operate a Business to Business ("B2B") model, and generate the majority of their revenue through sales of perpetual and/or subscription software licences and the associated support and maintenance services; (d) Resellers/distributors of cloud services that typically have their own business relationships with their customers (which, if reselling or distributing AWS Services, are called AWS partners) and systems aggregators, which help combine solutions from multiple providers; and (e) End customers, who consume cloud services as "building blocks" and typically do not own the underlying hardware and software for the IT solutions which they purchase from cloud and on-premises services providers. <p>2.2 AWS is aware that many stakeholders use the terms "infrastructure as a service" ("IaaS"), "platform as a service" ("PaaS") and "software as a service" ("SaaS") to classify cloud services. Whilst AWS is familiar with these terms, as a general rule, AWS does not use them when analysing customer needs and does not believe that these distinctions reflect the actual competitive dynamics for cloud and other IT services. Indeed, concepts of cloud "segments" do not capture how customers buy most IT services, or the competitive pressure that AWS and other cloud providers face from many types of IT services.</p>

<p>3. Would you highlight any particular feature of the cloud market in Spain as compared to other European countries? How do you assess the overall competitive situation of the cloud market in Spain? Are there any particularly significant trends? (max. 300 words).</p>	<p>3.1 IT service providers compete globally. AWS has not observed material differences between sourcing patterns and requirements for IT services in Spain compared to the rest of the world and, as a general rule, there is no substantial technical differentiation between AWS's offerings (or, as far as AWS is aware, those of other IT providers) in different countries and regions. Spanish-based customers may use AWS's services to reach their end users or provide services around the world, so AWS does not recognise a distinct Spanish market for these services, which are part of the worldwide IT sector.</p> <p>3.2 Indeed, AWS competes at the global level against a large array of competitors of varying scale in the highly competitive global sector for the provision of IT solutions, which goes well beyond potential segments of services, or cloud services more generally. This includes strong competition from some of the largest technology companies in the world, including Microsoft, Alibaba, Cisco, Google, IBM, Dell, HPE, and Oracle. AWS also competes with system integrators, such as Accenture, HCL, Cognizant, Deloitte, and Capgemini, to whom enterprises frequently outsource their IT functions, as well as data centre colocation providers, such as Equinix, Claranet, and Digital Realty. In addition, AWS faces competition from newer and disruptive IT services providers such as Google Cloud, Alibaba, and OVH, Scaleway, Exoscale, gridscale, Aleph Alpha, and Imbue, and from software vendors, such as Oracle, Salesforce, and Workday, who enterprise customers may opt to work with rather than building similar services or applications themselves. Further, AWS vigorously competes with on-premises IT solutions.</p>
<p>4. In your opinion, what are the main elements that determine the dynamics of competition among cloud service providers? In your opinion, which other markets can affect the competitive dynamics in the provision of cloud services? (max. 300 words).</p>	<p>4.1 The IT sector is extremely dynamic and characterised by constant innovation and disruption from new and existing businesses. It is a sector marked by sophisticated customers who know what they want and employ IT experts (or external IT expert consultants) to make purchasing decisions; this creates increased scrutiny of business offerings and competitive pressure. IT providers large and small are constantly developing new technologies to meet customer needs and solve novel problems. Each offer a unique set of services and features, and compete on factors such as security, reliability, availability, scalability, and price. This innovation is what drives competition in the IT sector, and in AWS's experience customers rank the quality of service as a key driver for choosing their IT providers.</p> <p>4.2 Bearing this in mind, AWS designs its services to give customers the freedom to build the solution that is right for them and does not prevent or limit customers from adopting different IT strategies. Indeed, when AWS pioneered the provision of cloud services, a key component was providing customers with the flexibility to use different building blocks or modules to design their solutions to meet their needs, including moving between, and interoperating across, different IT environments. AWS was also the first IT provider to offer pay-as-you-go pricing, creating an immediate reduction in the cost and burden of switching providers and solutions.</p> <p>4.3 Not all IT providers have the same commitment towards flexibility –some use licensing practices that can impact the competitive dynamics in the provision of cloud computing services by restricting customer choice and making switching more difficult. For example, Microsoft changed its licensing terms in 2019 and again in 2022 to make it more difficult for customers to run some of its popular software offerings on Google Cloud, AWS, and Alibaba.</p>
<p>5. In your opinion, when contracting cloud services from an operator, how do the main providers' offers differ from each other? (max. 300 words).</p>	<p>5.1 IT providers compete on factors such as security, reliability, availability, scalability, and price. The amount of choice available to meet customers' specific requirements means that there are numerous possibilities for a given IT services provider to be perceived as the best fit to solve the needs of a particular customer. Indeed, as explained in the response to Question 4 above, IT providers, large and small are constantly developing new technologies to meet customer needs and solve novel problems, with each offering a unique set of services and features.</p> <p>5.2 Customers are rarely, if ever, looking simply to use "the cloud" as an end in itself. The solution for a particular IT problem may involve one or more different services, such as compute, storage and networking, working together in a specific way, and which can be deployed on the customer's premises, in a co-located environment, online, and/or adopting a hybrid approach using several of these options.</p> <p>5.3 Customers also often opt to use multiple providers and solutions for their various IT needs. For example, a company that wants to launch a web-based fitness application would begin by defining what they need to build the application and deliver it to end-customers, which would include (amongst other things) a development platform to build the application itself, processing, data storage, a database for fitness data, networking to allow the data to flow to users and back, and payment and security. Each of these could come from different technology providers – for example, the compute could come from Dell, the storage from EMC, the database from Oracle and the development platform from Atlassian.</p>

<p>6. When contracting cloud services from an operator, describe in order of importance the factors that, in your opinion, are the main determinants of the contracting decision, such as, among others, price, technical quality of the service, the provider's portfolio of services, security, transparency of the contract, nationality of the provider, previous relationship with the same provider, previous knowledge by the staff, etc. (max. 300 words).</p>	<p>6.1 As stated in Questions 4 and 5 of this response, AWS remains close to customers and focuses on elements it knows they will value over the long-term. IT providers need to constantly develop and offer a unique set of services and features in order to compete on factors such as security, reliability, availability, scalability, and price. Some customers may be interested in the location where their data will be held, in which case, AWS works with its customers, regulators, and partners to understand such needs and requirements.</p>
<p>7. When contracting cloud services from an operator, assess the extent to which contract terms and conditions are negotiable (max. 300 words).</p>	<p>7.1 AWS typically provides its services on a standalone and pay-as-you-go basis; by default, AWS customers opt to simply enter into the online click-through AWS Customer Agreement (available at https://aws.amazon.com/agreement/) and pay only for the individual services they need, for as long as they use them, which means the vast majority of customers do not negotiate terms.</p> <p>7.2 Some customers, typically those with higher spend rates, request additional bespoke terms and AWS negotiates them to win business. Such customers may enter into an AWS Enterprise Agreement, which contains terms commonly requested by enterprise customers, such as invoicing and regulatory compliance commitments.</p> <p>7.3 For a very small minority of customers who have business objectives that require AWS services over time and who can broadly predict their minimum service needs across services, AWS has developed a private pricing program through which it offers additional discounts in exchange for a commitment to spend a certain amount across AWS services. These discounts are set out in a confidential private pricing addendum ("PA") to the customer's agreement with AWS. The choice to enter into a PA is entirely voluntary and is not required to use AWS services.</p>
<p>8. Indicate what difficulties may arise, at the time of contracting a provider's cloud services, to anticipate the final cost of use of the contracted service (max. 300 words).</p>	<p>8.1 Customers may encounter difficulties in predicting their IT needs at the time of contracting. One of the advantages of contracting AWS cloud services is that, if customers are aware of their needs, they can secure determined prices. Otherwise, they can benefit from our on-demand model, which offers flexibility.</p> <p>8.2 AWS offers more than 200 fully featured services typically on a pay-as-you-go basis so customers can tailor their purchase based on their operational needs. By default, AWS customers pay only for the individual services they need, for as long as they use them. AWS lists its pay-as-you-go prices publicly on its website (with limited exceptions available at https://aws.amazon.com/pricing/), and any customer can use AWS's services at these listed prices as much or as little as they need.</p> <p>8.3 AWS also provides pre-contractual pricing calculator (see https://calculator.aws/#/?nc2=h_ql_pr_cal) to assist customers in estimating costs before commitment. Once a customer has contracted with AWS, AWS offers a suite of cost management tools, such as Cost Explorer (see https://aws.amazon.com/aws-cost-management/aws-cost-explorer/) to help manage and optimize expenses. These resources empower customers to make informed decisions that best suit their evolving business requirements.</p> <p>8.4 A key tenet of AWS's strategy is for prices to be easy to understand and predictable for customers. Central to AWS's approach to pricing is ensuring that customers can build their long-term solutions on AWS services with expectations of pricing stability. AWS continually seeks to lower its costs over time and to pass those savings along to customers. In order to win customers' business, AWS needs to constantly innovate to offer the most value through its products at competitive prices. To do this, AWS seeks to continually lower customers' costs where possible through price reductions over the long run to stay competitive among the breadth of alternatives available to customers.</p>

<p>9. Assess the transparency of contract terms and conditions and indicate whether changes in contract terms and conditions are common (max. 300 words).</p>	<p>9.1 As explained in the response to Question 7, the terms of the AWS Customer Agreement are publicly available and fully transparent.</p> <p>9.2 Under the AWS Customer Agreement, AWS may modify the AWS Customer Agreement by posting a revised version on the AWS website or by otherwise notifying the customer in accordance with the agreement. Recent examples of such amendments include improvements to the intellectual property rights protection that customers benefit from under the agreements, as well as general clarifications and updates (e.g., to the AWS mailing address and AWS contracting party). AWS provides customers with at least 30 days' prior notice of any change in fees for existing services (see https://aws.amazon.com/agreement/recent-changes/ for a summary of latest implemented changes and to access prior versions).</p> <p>9.3 AWS may enter into similar amendments with respect to negotiated contracts. Customers may request changes such as including commitments to enable customers to meet their regulatory needs, additional security commitments, and modified liability terms. AWS understands that enterprise customers have a choice of cloud and on-premises IT services to choose from and as such seeks to accommodate such requests to remain competitive.</p>
<p>10. In migrating to the cloud, explain the role of the integrator or intermediary, and its relevance to the competitive dynamics of the market (max. 300 words).</p>	<p>10.1 AWS has implemented the AWS Partner Network ("APN"), which is the global community of partners who work with AWS to build solutions and provide services for customers (see https://aws.amazon.com/partners/). AWS partners are independent companies that typically have their own business relationships with their customers. They are therefore well positioned to help their customers take full advantage of all that AWS has to offer and accelerate their journey to the cloud. The APN ultimately improves competitive dynamics to the benefit of customers, as AWS partners work with and assist customers in using AWS services more effectively, providing innovative solutions, solving technical challenges, winning deals, and delivering great customer value. In addition, the APN enables the delivery of personalised solutions to customers that would be unattainable by AWS alone, while allowing partners access to a broader customer base. Some partners of the APN become authorised resellers of AWS products and solutions through the AWS Distribution Program (see https://aws.amazon.com/partners/programs/distribution-resellers/).</p> <p>10.2 The APN includes three categories of partners: Solution Providers (who resell and deliver AWS services directly to end customers as part of their other products and services), Authorised Distributors (who resell and deliver AWS services to end customers through their own networks of distribution sellers) and Solution Providers that work with Authorised Distributors in order to become what AWS calls "Distribution Sellers".</p>
<p>11. For software development companies offering independent cloud-based software applications, consider which are the main channels to reach the end customer and the factors on which the choice of the chosen channel(s) depends. When offering independent cloud-based software applications, consider whether it is possible to do so in more than one marketplace from a vertically integrated provider (max. 300 words).</p>	<p>11.1 Software developers reach end customers in a variety of ways, including direct sales, sales through partners, and sales through marketplaces.</p> <p>11.2 In particular, AWS enables ISVs to enhance their visibility and reach new customers, especially through the AWS Marketplace, where customers can purchase from among thousands of third-party services running on AWS, making it easy for customers to obtain and use third-party IT services that run on AWS (see https://aws.amazon.com/marketplace/). AWS also offers the AWS ISV Accelerate Program, which connects ISVs with the AWS Sales organisation to provide co-sell opportunities, support, and benefits.</p> <p>11.3 Sellers are also able to sell IT services directly to AWS customers (or any other customers, for that matter) without any need to do so via the AWS Marketplace. Sellers using the AWS Marketplace are also free to sell their IT services to customers of competing IT providers – they are not limited or restricted to selling only on the AWS Marketplace. The fact that IT services running on AWS can be sold through multiple channels and are not required to be sold on the AWS Marketplace reflects this freedom and the lack of restrictions.</p>
<p>12. Assess the conditions required to intermediaries to be able to sell the products of one or more cloud service providers, and whether in your opinion they affect the competitiveness of the final solution offered by the intermediary in relation to other sales channels (max. 300 words).</p>	<p>12.1 As stated in Question 10 of this response, AWS partners work with AWS to build solutions and services for customers. All AWS partners enter into the APN terms and conditions that are available here: https://aws.amazon.com/partners/terms-and-conditions/. These terms are non-exclusive (see APN terms and conditions, paragraph 8.8).</p> <p>12.2 While there are benefits in a Partner developing its relationship with AWS (see https://aws.amazon.com/partners/services-tiers/ for examples of tiers and benefits in the Services path), AWS partners are free to work with any other IT service provider. AWS maintains a flexible relationship with its Partners, offering them the opportunity to expand their customer reach and enhance the value of their own unique offerings. Indeed, many AWS partners also work closely with many of AWS's competitors. For example, Slalom lists AWS, Google Cloud Platform ("GCP"), Microsoft, Salesforce Service Cloud ("SFDC"), Snowflake and Tableau as its "Technology Platforms" (see https://www.slalom.com/). AWS does not impose restrictions on AWS partners who offer services that compete directly with AWS services. For example, Snowflake, Databricks, Cockroach Labs, DataStax, MongoDB and Redis are all competitors of AWS through their provision of database and analytics services, as well as AWS partners.</p> <p>12.3 Customers are always free to choose which services they want to purchase from AWS partners, which may include cloud services supplied by AWS, cloud services supplied by other vendors, or IT services and products more generally.</p>

<p>13. Assess whether there are significant barriers to entry in the cloud services or cloud infrastructure market. If so, indicate and describe what type of barriers (e.g., regulatory, investment size, availability of qualified staff, other) and indicate which services or cloud layer (IaaS, PaaS, SaaS) are affected by each barrier (max. 300 words).</p>	<p>13.1 AWS operates in an extremely dynamic and growing IT industry with minimal barriers to entry and expansion. Competition to offer on-demand IT services has grown rapidly since AWS launched, and is intensifying as new and existing players enter and expand at a significant pace. There is no shortage of companies rushing in to fill identified gaps and opportunities to serve customers better, e.g., Spectral Ops, Snowflake, Databricks, MinIO, Mulesoft, Neo4J, and others. However, there are a few actual or potential hindrances to growth and the innovative dynamics that underpin competition in the provision of cloud services.</p> <p>(a) Regulations: cloud services providers are subject to both general and specific business regulations and laws. Different jurisdictions may require certain permits or certifications to provide storage, database management or computing services. For further information in this respect, please see response to Question 24.</p> <p>(b) Planning restrictions and local regulations: if a provider decides to build its own data centres, in some locations this may be subject to planning permission and regulatory requirements, such as government permits and licenses. However, the elements of IT infrastructure typically do not need to be located near a customer, so providers can choose locations where these requirements may be more easily satisfied.</p> <p>(c) Abusive software licensing restrictions: software licensing practices can and do in certain circumstances present a significant barrier for cloud services. As explained further in response to Questions 4, 16 and 23, AWS is aware of several aspects of Microsoft's contractual and business practices that are negatively impacting customer choice and the ability of competing providers to provide or expand cloud services.</p> <p>(d) Legacy hardware and software: customers using on-premises IT solutions have been and continue to be largely "locked-in" to costly infrastructure legacy hardware, as well as software that only runs on specific hardware.</p>
<p>14. In your opinion, assess which cloud layers (IaaS, PaaS, SaaS) present the greatest competitive challenges and explain why (max. 300 words).</p>	<p>14.1 As explained in response to Question 4, the IT sector is extremely dynamic and characterised by robust and growing competition across all services, constant innovation and disruption from new and existing businesses. As stated in response to Question 2, AWS is aware that many stakeholders use the terms "IaaS", "PaaS" and "SaaS" to classify cloud services. Whilst AWS is familiar with these terms, as a general rule, AWS does not use these terms when analysing customer needs and does not believe that these distinctions reflect the actual competitive dynamics for cloud and other IT services.</p> <p>14.2 Applying such ambiguous terms to feature-rich, evolving products creates the risk that people will reasonably apply different labels to the same products. In fact, IT providers increasingly use "as a service" as a marketing term, leading to the proliferation of labels such as Function as a Service ("FaaS"), Database as a Service ("DBaaS"), and Backend as a Service ("BaaS"), which lack any definition or customer use beyond marketing copy. The emergence of these new terms reflects the poor fit of "as a service" marketing terms to analyse competition among modern IT services. Independent analyst reports confirm the industry trend away from using categories like IaaS, PaaS, and SaaS. For example, Gartner stopped basing its magic quadrants on IaaS and PaaS, recognising that these categories do not adequately reflect the changing dynamics of cloud services and the ways that enterprise customers adopt them. For these reasons, AWS does not consider that the terms IaaS, PaaS, and SaaS provide useful information when discussing market dynamics. Customers are solutions-oriented, and the solution for a particular IT problem may involve one or more different services, with many choices of deployment methods and service providers that compete fiercely within these environments.</p>
<p>15. For companies already present in the cloud market, what are the main obstacles to their activity and to competition in the sector? (max. 300 words).</p>	<p>15.1 AWS operates in an extremely dynamic and growing IT industry with minimal barriers to entry and expansion. However, there are a few actual or potential obstacles for companies already offering cloud services.</p> <p>15.2 One of the primary challenges to the business activities of cloud service providers such as AWS is facilitating the customer's journey towards cloud adoption from on-premises infrastructure. As stated in response to Question 6 of this response, customers using on-premises IT solutions have been and continue to be largely "locked-in" to costly infrastructure legacy hardware, as well as software that only runs on specific hardware. Prior to the introduction of on-demand IT services by AWS, switching IT providers was often a prohibitively expensive, multi-year process. Legacy IT customers were, and in many cases still are, bound by the many millions of dollars spent on on-premises infrastructure hardware, limited to only using software that was compatible with their infrastructure hardware, and subject to restrictive licensing terms. Even today, many businesses still use decades-old mainframe technology because switching from existing hardware is often too costly.</p> <p>15.3 A number of other factors could affect cloud service providers' ability to service customer demand and the cost and time to launch a potential infrastructure expansion. These include: (i) availability, cost, and quality of existing colocation capacity; (ii) availability and cost of suitable land; (iii) availability and cost of power/renewable energy; (iv) water availability; (v) networking costs and performance (backbone and metro fibre); (vi) timelines to obtain permits; (vii) import duties and timelines; and (viii) the tax and treasury landscape.</p>

<p>16. Assess what technical or economic difficulties exist for migrating to the cloud. Indicate, in your opinion, which solutions could be implemented to mitigate them (max. 300 words).</p>	<p>16.1 A key component of AWS's approach to the provision of on-demand IT services is providing customers with the flexibility to design their solutions to meet their needs, including through switching between IT providers, which has never been easier for IT customers to do. However, certain switching costs are inherent to IT, and customers must generally account for the time and cost of making the change, staff resistance to change, and search costs, among other factors. Therefore, moving data and changing IT services still naturally takes some time and resources, though cloud computing has made the process easier, more convenient, faster, and cheaper.</p> <p>16.2 Because customers use multiple different options to meet their varying IT needs, it is important to make it easy for customers to migrate all or part of their workloads on and off AWS's services. AWS has devoted significant resources in this area and developed a set of training and guidance for its customers to help facilitate multi-clouding and switching. That includes migrations to and from traditional on-premises hardware vendors, private data centres, hosted installations, co-located data centres, managed service providers, and software providers, in addition to other cloud services providers. Please see AWS's response to Question 17 below for further information on the migration tools adopted by AWS to mitigate these difficulties.</p> <p>16.3 As noted in AWS's response to Question 4 above, some cloud services providers use licensing restrictions which prohibit switching. For example, where a customer has existing Microsoft productivity software licenses for an on-premises architecture, Microsoft sometimes will allow them to use that license on Azure but not with AWS. There are many examples of specific customers leaving AWS or choosing not to use AWS's services because of such licensing restrictions.</p>
<p>17. In your opinion, once the services of one cloud provider have been contracted, what technical, economic or other factors might make it difficult to change provider? In your opinion, which solutions might be implemented to mitigate these difficulties? (max. 300 words).</p>	<p>17.1 The cloud, and AWS in particular, has made switching between IT providers easier than ever before, which encourages vigorous competition to provide high-quality, innovative IT services at low cost. AWS has been at the forefront of developing technical solutions to make it easier to transfer data and workloads across different IT providers. For example, AWS's services support many standardised and open-source software such as Open Cybersecurity Schema Framework, Glide for Redis, or Cedar, which make switching more straightforward and less complex. Further, AWS has invested heavily in container technologies offerings like Amazon Elastic Kubernetes Service Anywhere and Amazon Elastic Container Service Anywhere. These containers use formats established by the Open Container Initiative and can be run on AWS or moved to other IT providers with limited changes. When customers want to switch to another provider, AWS helps customers by making available services aimed to facilitate the transfer of their data to the provider of their choice, e.g., S3/EC2 Data Transfer, AmazonS3 Transfer Acceleration or AWS Transfer for SFTP. Other cloud services providers also offer migration services to assist customers wishing to switch away from AWS (e.g., Azure Migrate, Google Database Migration Service, and Oracle Cloud Migrations).</p> <p>17.2 AWS customers can also to transfer 100 gigabytes of data from AWS Regions to the Internet ("DTO") free of charge, which means over 90% of AWS' global customers with DTO usage do not pay any DTO charges (including those who switch or multi-cloud). Globally, since March 2024, AWS offers free DTO to all customers who switch from AWS (see https://aws.amazon.com/blogs/aws/free-data-transfer-out-to-internet-when-moving-out-of-aws/). AWS also continually informs customers about how they can minimise the cost of switching to another provider by planning, designing, and testing for "reversibility", i.e., the ability of a customer to retrieve and move data from one IT environment to another.</p>
<p>18. In your opinion, what are the difficulties in contracting the services of more than one cloud provider? In your answer, please assess aspects of vertical interoperability (between services located in different cloud layers), horizontal interoperability (between services located in the same cloud layer) and interoperability of the data produced when using different cloud services. In your opinion, what solutions could be implemented? (max. 300 words).</p>	<p>18.1 Multi-clouding can be set up in various forms depending on the customer's needs. There is a spectrum of different multi-cloud IT structures depending on the IT architecture of the cloud services providers and customers. These include integrated multi-cloud, where customers mix and match different cloud services from different cloud services providers; duplicative multi-cloud, where customers use multiple cloud services providers to fulfil the same function; and siloed multi-cloud, where customers use different cloud services providers for different workloads with no or minimal integration between the different clouds.</p> <p>18.2 Customers may obtain a better experience when they choose to work primarily with one cloud services provider. For example, customers running an application across multiple providers may see lower availability than running in a single cloud environment, and multi-cloud can force companies to standardise on the lowest common denominator usually reducing the speed at which changes can be made. Due to the greater complexity and increased staffing requirements, multi-clouding usually leads to higher costs.</p> <p>18.3 Despite the potential advantages of operating in a single environment, most customers nonetheless choose to use a combination of providers. This may be driven for a variety of reasons; for example, perceived improved contingency planning, desired functionality of a specific service, or legacy relationships for certain workloads. To assist customers who choose this, AWS has developed a number of solutions, including, for example, AWS Migration Hub, which simplifies the process of switching workloads between IT providers for customers, CloudEndure on AWS Outposts, which enables customers to replicate and recover applications from any source, including outside of AWS, and AWS Systems Manager, which allows customers to manage their virtual machines and servers regardless of whether they are running the virtual machines and servers on AWS or on other cloud services providers or on-premises architecture.</p>

<p>19. Assess the advantages and disadvantages of adopting interoperability standards or protocols, including their impact on competition and/or innovation (max. 300 words).</p>	<p>19.1 Interoperability by adopting open standards and open-source software creates advantages for IT service providers, such as reduction of costs for both providers and customers, as the development costs are shared by a community, and higher return on the initial investment made versus the closed source process, given that open-source software has broader appeal to developers and the costs of maintaining it may be lower than a proprietary service. Furthermore, open-source solutions allow cloud providers to benefit from improvements and innovation made externally by the broader IT community, maximising the use and quality of their services.</p> <p>19.2 However, any movement to impose mandatory interoperability standards or protocols would render obsolete any advantages indicated above and would risk serious harm to competition.</p> <p>19.3 Static mandatory standards would run counter to the dynamic needs of the IT sector. Even if certain technologies have become de facto standards among cloud providers and users, it is entirely possible and likely that these standards can and will change as technology continues to evolve.</p> <p>19.4 Further, the requirement for cloud services to be fully interoperable (impossible in practice) or work with a predetermined set of standards would at the very least, increase the cost of innovation and reduce incentives to innovate, which would ultimately not benefit customers.</p> <p>19.5 Presumably for this reason, the “Regulation on harmonised rules on fair access and use of data” (“EU Data Act”) states that regulatory intervention should only take place to the extent that market driven processes have not demonstrated a capacity to establish common specifications or standards that facilitate cloud interoperability at different levels (Recital 100). In AWS’s view, efforts to standardise within Europe should aim to avoid fragmentation and European Commission should engage with international organisations such as ISO during the process for development of standards, where needed.</p>
<p>20. When contracting services from the same cloud provider, and from the point of view of its commercial offer, assess what obstacles exist to contracting each service separately (max. 300 words).</p>	<p>20.1 Unlike other cloud services providers, AWS does not bundle or tie cloud services with other services. AWS customers are free to use services in isolation, or in conjunction with other AWS services, or with third-party services, as appropriate for their use case. Indeed, AWS offers its services on a pay-as-you-go pricing basis for over 200 services so customers can tailor their purchases based on their operational needs. By default, AWS customers pay only for the individual services they need, based on actual usage. AWS lists its pay-as-you-go prices publicly on its website, available at https://aws.amazon.com/pricing/. AWS was the first IT provider to offer pay-as-you-go pricing, creating an immediate reduction in the cost and burden of switching providers and solutions.</p> <p>20.2 However, as noted in the response to Question 23 below, restrictive software licensing practices by legacy providers such as Microsoft limit customer choice.</p>
<p>21. When contracting additional services from a cloud provider, assess the relationship between contracting these services and the discounts for the use of additional services (max. 300 words).</p>	<p>21.1 Please see AWS’s response to Question 7 above of this response for further information in relation to the discounts AWS offers its customers.</p>
<p>22. Assess the existing obstacles to competition in the public procurement of cloud services, and indicate the solutions that could be implemented in your opinion (max. 300 words).</p>	<p>22.1 Certain customers, such as public sector authorities, are required under public procurement regulations to run a competitive procurement process to procure certain services, including IT. In Spain, there is no general framework agreement in place at the national level to procure cloud services, which means that each contracting authority at any level of the national administration is responsible for preparing and initiating tenders for cloud procurement.</p> <p>22.2 Procurement of cloud services has proliferated in recent years, which has become a challenge for many contracting authorities that have limited knowledge or resources to prepare tenders of this nature. In 2021, the Ministry of Digital Economy officially designated “cloud services” as the subject of mandatory central IT procurement for the sake of rationalization and efficiency of National government expenditure. This indirectly set the mandate to launch a central procurement vehicle for national government authorities to have easy, transparent access to the cloud. Further, the Ministry of Finance adopted the annual central procurement official plans for 2023, which announced the procurement of SaaS services during that year and, more recently in 2024, the procurement of IaaS/PaaS services, via a central framework agreement. AWS endorses these initiatives and believes they are a step in the right direction. Although the central procurement of SaaS has been launched, AWS notes that there are currently some delays on the implementation of the central framework agreement for IaaS/PaaS. In this respect, it is crucial that the plans for procurement centralisation are finalised and implemented effectively in order to improve efficiency, transparency and fair competition in the public procurement of cloud services.</p> <p>22.3 Finally, certain software licensing practices, such as the ones outlined in response to Question 23 below, can impact customer choice and prevent effective competition, including in the context of public procurement.</p>

<p>23. Provide additional comments on other barriers, distorting factors or issues that you consider relevant to the functioning of this sector (max. 500 words).</p>	<p>23.1 AWS competes at the global level against a large range of competitors of varying scale in the highly competitive global sector for the provision of IT solutions. However, as stated above, some IT providers, such as Microsoft, use licensing practices that restrict customer choice and make switching more difficult.</p> <p>23.2 Microsoft changed its licensing terms in 2019 and again in 2022 to make it more difficult for customers to run some of its popular software offerings on Google Cloud, AWS, and Alibaba. To use many of Microsoft's software products with these other cloud services providers, a customer must purchase a separate license even if they already own the software. This often makes it financially unviable for a customer to choose a provider other than Microsoft. A study by Professor Frédéric Jenny published on 22 March 2023 (see: https://cispe.cloud/website_cispe/wp-content/uploads/2023/06/Quantification-of-Cost-of-Unfair-Software-Licensing_Prof-Jenny_-June-2023_web.pdf), estimated that the first-year extra cost caused by customers needing to repurchase existing BYOL Microsoft 365 software licences to use them in conjunction with third party cloud services was approximately EUR 560 million in Europe, and a cost increase of up to 80-100% for Microsoft software compared to when there was no such requirement. This study also estimated that Microsoft's SQL Server licensing restrictions "can result in a relative price increase of up to 300% for customers choosing a non-Azure cloud infrastructure." These estimates demonstrate how Microsoft's licensing fees are detrimental to customers. They have also negatively impacted Microsoft's cloud service competitors.</p> <p>23.3 Microsoft has acknowledged the concerns of customers, but rather than fix its policy so all customers can run Microsoft's software on the cloud services provider of their choice, it has prevented IT customers from being able to run Microsoft's software on specific workloads or specific cloud services providers' infrastructure. While AWS is pleased that its customers will now be able to bring their own existing Microsoft 365 licenses for use on one particular service (Amazon Workspaces) (see https://aws.amazon.com/about-aws/whats-new/2023/08/amazon-workspaces-microsoft-365-apps/), this does not resolve its customers' continued concerns over general access to Microsoft's numerous other, widely used services. These concerns will persist until IT customers are not prevented from using Microsoft's services on the IT provider of their choice. AWS supports the Principles for Fair Software Licensing (see https://www.fairsoftware.cloud/principles/), and believes that the best way to eliminate unfair licensing practices for all customers is to embrace these established Principles as standard practice for the industry.</p>
<p>24. Assess the current European and national regulatory framework in its ability to promote an efficient and competitive operation of the cloud services market. If so, how could it be improved? (max. 500 words).</p>	<p>24.1 Novel regulatory initiatives which may impact the provision of cloud services are being introduced in Spain and around the globe that may bring about further compliance requirements for the operation of cloud services providers.</p> <p>24.2 At the European Union and Member States levels, regulatory requirements include the directive concerning measures aimed at ensuring a high common level of cybersecurity in the whole of the European Union (the "NIS2 Directive"), which defines a cybersecurity framework that includes, in particular, specific obligations for suppliers of cloud services in the European Union (though note that the NIS2 Directive has not yet been transposed at the Spanish national level); the Digital Operational Resilience Act ("DORA Regulation"). DORA Regulation outlines improvements in information and communications technology and security risk-management requirements, a harmonisation regime for incident reporting, the development of a digital operational resilience testing framework, and an oversight framework for critical third-party providers. It introduced new requirements for cloud services providers to financial institutions; and the EU Data Act (as defined above) — a horizontal framework that introduced new requirements on cloud services providers in relation to customer switching and in-parallel use of multiple cloud services, including restrictions on what the provider can charge for.</p> <p>24.3 In addition, the Royal Decree 311/2022 regulates the Spanish National Security Scheme, which outlines the security principles and requirements that public sector information systems must adhere to in order to ensure the proper protection of the processed information. Royal Decree 311/2022 delineates the security measures that an operator must incorporate in order to supply cloud services to a public sector entity.</p> <p>24.4 Please see AWS's response to Question 25 of this response for further information.</p>
<p>25. In your opinion, what other regulations could affect the competitive dynamics of the cloud sector? If so, how could they be improved? (max. 500 words).</p>	<p>25.1 The requirements of the regulations contemplated in Question 24 above cover mandatory contractual obligations, interoperability, transparency, enhanced information on services and supply chain, audit rights, security testing, incident reporting, amongst many other aspects. As discussed above, this places a heavy compliance burden on cloud providers, and AWS does not consider that further intervention is necessary in light of the extensive ground existing and forthcoming regulations cover.</p> <p>25.2 In addition, it is important for regulators to consider the proportionality between the objective of the regulations and the impact of compliance. This compliance work cannot be outsourced to independent third parties as it requires a knowledge of, and access to, AWS's internal business and systems which only internal AWS employees can provide. The extensive time and human resource which AWS spends internally on compliance with regulatory requirements, increasingly pulls internal business and corporate teams (including, for example, engineers, project managers, legal, finance, accounting, tax, policy, and public relations) away from their day-to-day work on new product and feature development.</p> <p>25.3 More particularly, the EU Data Act was, regrettably, not accompanied by any in-depth economic analysis of the impact it will have on competition and innovation in the cloud services sector. The EU Data Act was neither enacted in response to demonstrated harm to competition. It therefore remains to be demonstrated what impact it will have on competition. AWS otherwise believe that anti-competitive harm can be best identified and addressed by enforcing existing antitrust laws.</p> <p>25.4 Please see AWS's response to Question 24 of this response for further information.</p>

<p>26. Provide additional comments on other solutions or recommendations (not necessarily of regulatory nature) to improve the competitive dynamics in the cloud sector (max. 500 words).</p>	<p>26.1 AWS operates in an extremely competitive and dynamic IT industry with minimal barriers to entry and expansion and businesses, and the economy overall, have benefitted from robust competition among IT providers.</p> <p>26.2 However, software licensing practices can and do in certain circumstances present a significant barrier for cloud providers. Some IT providers use licensing practices that restrict customer choice and make switching more difficult. AWS's view is that such abusive licensing restrictions harm customers by impacting customer choice and causing them to bear unnecessary costs, while limiting the ability of competing providers to provide cloud services or expand the provision of cloud services. Accordingly, AWS welcomes regulatory initiatives that seek to address those practices.</p> <p>26.3 Notwithstanding this, competition and innovation will only thrive in the right regulatory environment. Any misguided regulatory intervention would have a detrimental and enduring impact on the development of cloud services at a time when innovation is critical.</p>
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