June 25, 2024

Cloud Services Market Investigation

AWS's response to the CMA's updated issues statement and working papers

1. We appreciate the opportunity to comment on the Competition and Markets Authority's ("**CMA**") updated issues statement and working papers in relation to its cloud services market investigation. We recognise that the working papers reflect the CMA's emerging views, and that the CMA has not reached any conclusions at this stage, as it continues to gather and review evidence.

2. The evidence in the working papers presents a clear picture of a market for IT services that is well-functioning, innovative, dynamic, highly competitive, and produces considerable benefits for customers. The only reasonable interpretation of the evidence before the CMA is that this market requires no regulatory intervention. In particular, the working papers recognise, and we also observe, that the supply of cloud services supports an efficient industry that meets the needs of customers in terms of pricing, innovation, product choice, variety, and quality. Customers' own experience — as told to the CMA and reflected in the Competitive Landscape Working Paper ("**CL Working Paper**") — is that they can multi-cloud and switch between different IT providers when they want to[1] and effectively renegotiate contract terms with their existing IT providers.[2] The CMA itself acknowledges in its updated issues statement that this is what is expected in a well-functioning market.[3] The working papers do not present any evidence supporting the existence of an "*adverse effect on competition*" ("**AEC**")[4] arising from the supply of cloud services. Any proposed regulatory intervention would entail considerable risk, including hindering innovation, reducing investment, and disrupting competition, which would harm customers. Moreover, unwarranted, heavy-handed regulation of one of the most well-functioning, innovative sectors of the economy risks undermining the UK as an attractive destination for investment in technology.

3. One exception to the well-functioning nature of the market for IT services is Microsoft's licensing practices. We are encouraged by the CMA's attention on this topic and its emerging views. We are also optimistic about the CMA's considerations on how best to ensure that customers can choose the IT provider of their choice to run Microsoft's immensely popular and critical productivity software. Software licensing issues are distinct from the rest of the CMA's emerging views in the working papers as they relate to Microsoft leveraging its legacy "must-have" productivity software to restrict customers' ability to choose the IT provider of their choice. Unlike Microsoft, most of the other IT providers tend not to have "must-have" legacy software that could be leveraged to distort competition to the detriment of customers. Indeed, licensing practices should not be leveraged to artificially restrict customer choice and make switching more difficult.

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1 CL Working Paper, paragraph 3.8.

2 CL Working Paper, paragraph 2.43.

3 Updated Issues Statement, paragraph 86.

4 Enterprise Act 2002, section 134.

4. We want to take this opportunity to address some of the CMA's emerging views that do not have a solid basis in the evidence before the CMA or the law. Several of the concerns reflected in the working papers are borne out of a misperception of the IT industry's competitive dynamics, as well as the functioning of data transfer out ("**DTO**") fees and committed spend discounts ("**CSDs**"). These emerging views would not withstand scrutiny if included in the CMA's final report on this market investigation. In particular:

    a. Cloud services providers of all sizes compete fiercely with each other and with on-premises IT providers — and customers agree. The working papers fail to recognise the competitive constraint of smaller cloud services providers and on-premises IT providers and that IT services can be, *and are*, deployed in a number of ways, including by adopting a hybrid cloud/on-premises approach.

    b. Customers can, *and do*, switch between cloud services providers. The working papers reach the incorrect conclusion that switching and multi-clouding is limited because they use a flawed methodology and limit the data in ways that lead them to underestimate switching and multi-clouding. Indeed, they exclude all cloud services providers and on-premises IT providers except AWS, Azure and Google from their analyses, they give very small customers equal weight as larger customers which fails to account for the actual prevalence of switching and multiclouding as a fraction of total usage or spend, they rely on a small number of respondents per cloud services provider, and rely on unstructured qualitative interviews producing anecdotal responses. On the other hand, the CMA's emerging views disregard compelling evidence, including that referenced in the working papers, showing that it is reasonably simple for customers to switch providers. They do not acknowledge that some customers simply do not want to switch (or multi-cloud), *e.g.*, because they are happy with their current provider due to higher quality or lower prices (as a result of competition on the merits between suppliers). Instead, the interpretation of third-party surveys and the Jigsaw Report included in the Technical Barriers Working Paper ("**TB Working Paper**") and CL Working Paper cherry picking examples to justify an emerging view that there are barriers to switching (and multi-cloud). By effectively ignoring switching between cloud services and on-premises and failing to compare it to switching between cloud services providers,[5] the CMA's emerging views have failed to grasp that not only do these technical barriers also exist outside of cloud-to-cloud migrations, but that AWS and other cloud providers have taken significant steps to make switching significantly simpler. While there are inherent costs associated with switching cloud services providers, as with all IT services, these do not constitute "barriers to switching" that undermine competition. The working papers provide no evidence that any market characteristic or behaviour is capable of resulting in customer harm, not least as there is no compelling evidence that customers wish to switch to get a better deal but are prevented from doing so due to the policies or practices of cloud service providers.

[5] TB Working Paper, paragraph 3.12.

c. The working papers fail to articulate any compelling theories of harm, let alone provide any evidence of an AEC. Indeed, the CMA acknowledges that there is a lack of actual harm to competition, and its findings confirm that several features of the sector it has examined drive pro-competitive benefits. In particular:

   - In its assessment of CSDs, the CMA acknowledges that discounts and price competition produce benefits for customers and can only give rise to competition concerns in specific circumstances. In contrast, the Committed Spend Agreement Working Paper ("**CSA Working Paper**") presents no empirical evidence to support that CSDs could potentially harm competition — the evidence presented is circumstantial, selective, largely anecdotal, and is not representative of customer opinion. This is revealed by responses to the CMA's issues statement and the Jigsaw Report, which show that customers find CSDs to be beneficial and pro-competitive.[6] The CSA Working Paper presents no evidence suggesting CSDs can be expected to, or do in fact, harm competition by foreclosing rivals, and dismisses evidence presented to the CMA to the contrary;[7] and

   - DTO fees, which AWS only charges in some instances (as explained in detail below), are a necessary cost to provide customers with a premium data transfer service that runs on top of a premium network, a distinctive factor and a key reason why customers choose us to provide their cloud services. According to the Jigsaw report, participants confirmed that DTO fees are not "top of their mind" and "almost no participant considered egress fees to be factor in their cloud provider choice".[8] The evidence clearly indicates that DTO fees are a minor consideration for customers thinking about switching and multi-clouding, rather than a material barrier, but the Egress Fees Working Paper ("**EF Working Paper**") selectively interprets the evidence to support unwarranted conclusions.

d. AWS and Microsoft compete fiercely with each other. The working papers wholly disregard these crucial competitive dynamics and are predicated on an incorrect, fictional assessment whereby AWS and Microsoft are treated together, as if they were one company with common goals and policies, particularly in relation to discounting practices.[9] It is not possible to draw meaningful conclusions from an analysis that is premised on such a fundamental misconception of the true competitive dynamics.

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6 See, *e.g.,* the Startup Coalition's response to the Issues Statement dated 17 October 2023, page 2; CCIA's response to the Issues Statement dated 17 October 2023, page 3; ACT's response to the Issues Statement dated 17 October 2023, page 5; Jigsaw: Cloud Services Market Investigation Qualitative Customer Research – Final Report, May 2024, paragraph 6.2.3.

7 See paragraph 46 below.

8 Jigsaw: Cloud Services Market Investigation Qualitative Customer Research – Final Report, May 2024, paragraph 5.1.2.

9 CL Working Paper, paragraph 5.15, CSA Working Paper, paragraph 1.6.

5. To assist the CMA, we set out below our views on these points in more detail. We have limited our comments to key points rather than addressing each of the CMA's emerging views. Therefore, to the extent that this submission does not cover particular points it should not be read as AWS agreeing with the CMA's emerging views.

The working papers postulate unsubstantiated theories in search of a problem — there is no prospect of an AEC in connection with the supply of cloud services in the UK

6. All evidence at the CMA's disposal shows that competition for the global supply of IT services, including cloud services, is functioning very well. It is dynamic and characterised by intense competition by firms innovating and differentiating their products and services for the benefit of consumers and the economy as a whole. Customers have access to an increasing variety of innovative IT services and features provided by a growing number of IT providers, which in turn fosters economic growth and prosperity in the UK and beyond. They can consume those services in the manner that best suits their needs. The CL Working Paper acknowledges that "*for quality and innovation there is no clear counterfactual to compare outcomes with what they might be in a well-functioning market*"[10] and no evidence is presented to support a conclusion that the current state of competition is not, indeed, "*well-functioning*". Any intervention could only be warranted in circumstances where strong evidence supports the finding of an AEC and where such intervention is appropriate to remedy, mitigate, or prevent any identified adverse effects. The evidence presented in the working papers does not suggest that there is any feature, or combination of features, in relation to the supply of cloud services globally or in the UK that prevents, restricts, or distorts competition, giving rise to an AEC. The opposite is the case — the working papers recognise that AWS and other cloud services providers face intense competition from each other and numerous providers of IT solutions with different delivery models. The CMA's own customer survey recognises that cloud services providers compete on a variety of different elements including price, quality, data sovereignty requirements, range of services, and other factors for each potential customer,[11] and invest heavily in anticipating and meeting customers' demand for innovation,[12] multi-cloud, and switching between cloud services providers. Customer feedback is positive, despite this telling evidence being inexplicably disregarded by the working papers, particularly in relation to the evidence illustrating the ease of switching and multi-clouding.[13] Further, there is no sign, let alone evidence, that competition will deteriorate in the foreseeable future, as existing IT providers continue to innovate, and new IT providers continue to enter the market. There is strong evidence that the market is well-functioning and no compelling evidence that supports any concerns that any features of this market can be expected to harm competition. Therefore, there is nothing to suggest that intervention would yield better outcomes for customers than what competition is already offering and will continue to offer customers and the economy as a whole. In these circumstances, intervention is not only unwarranted, but it would also distort well-functioning competitive dynamics to the detriment of customers and jeopardises prospects for continued innovation and creation of economic growth.

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10 CL Working Paper, paragraph 6.19.

11 CL Working Paper, paragraph 2.53.

12 CL Working Paper, paragraphs 2.81(a) and 6.13.

13 For positive customer feedback on ease of multi-clouding see TB Working Paper, paragraphs 4.14, 4.17 and 4.23.

Customers view a wide range of IT services as substitutable

7. Any attempt at market definition must start from the customers' perspective. For customers, IT services are substitutable for most use-cases, regardless of their delivery method (be it cloud or on-premises). Customers are typically looking to answer an IT need — they define their objectives and look at the companies that can meet those objectives — whether on-premises, in the cloud, or some combination. They are rarely, if ever, looking simply to use "the cloud" as an end in itself. Further, customers assess their IT needs on a workload-by-workload basis. Customers, therefore, consider services from multiple IT providers, including on-premises/private cloud solutions, independent software vendors ("**ISVs**"), and other cloud services providers (both larger and smaller cloud services providers). This means that customers demand and can use multiple IT providers or switch between different IT providers of their choice to ensure that their IT needs are met. Against this background, considering separate product markets for infrastructure-as-a-service ("**IaaS**"), platform-as-a-service ("**PaaS**"), and software-as-a-service ("**SaaS**") in the CL Working Paper does not reflect market reality. Customers care about solving for an IT need — they do not focus on industry labels such as IaaS, PaaS and SaaS. Indeed, they often mix and match different IT services to fulfil the same need, including combinations of IaaS, PaaS and SaaS.[14]

On-premises IT solutions exercise significant competitive constraints on cloud services providers[15]

8. Cloud services providers compete fiercely with on-premises IT providers — both to entice customers to move workloads from on-premises to the cloud, and to retain existing cloud services customers. When AWS pioneered IT services on demand over the internet in 2006 (so-called "cloud services"), a key component was providing customers with the flexibility to design solutions to meet their needs, including moving between, and interoperating across, different IT environments. According to leading industry analyst Gartner, less than 15% of global IT spend is on the cloud, nearly two decades after AWS launched. This means that on-premises IT providers continue to exert competitive pressure on cloud services providers seeking to gain new workloads.[16] The vast majority of customers therefore continue to use on-premises IT solutions offered by major providers like IBM, Dell, HPE, and Cisco, or co-located or managed services offered by a broad range of providers, including Equinix, NetApp, and Digital Realty.

9. AWS recognises that many potential customers will either stay or choose to move on-premises in the future, and in light of this has invested heavily in solutions that support the interaction between on-premises infrastructure and AWS's services. This includes for example, AWS

[14] CL Working Paper, paragraph 4.48.

[15] CL Working Paper, paragraphs 1.6 and 4.72.

[16] This market share is obtained by combining Gartner's estimates of total cloud spend Worldwide and total IT spend worldwide. See https://www.gartner.com/en/newsroom/press-releases/11-13-2023-gartner-forecasts-worldwide-public-cloud-end-user-spending-to-reach-679-billion-in-20240 and https://www.gartner.com/en/newsroom/press-releases/2024-04-16-gartner-forecast-worldwide-it-spending-to-grow-8-percent-in-2024.

Application Migration Services,[17] AWS Database Migration services,[18] Kubernetes,[19] and direct connections to on-premises environments from AWS, point-to-point connections, and site-to-site VPNs, among many other investments. In many instances, customers do continue to view on-premises services as being more suitable than cloud services for a specific workload. For example, a customer may require a level of latency for their IT solutions that on-premises solutions are better suited for due to physical proximity to the customer's data sources and architectures, *e.g.,* a customer engaged in high-speed algorithmic trading on a public market, or a customer's security needs may mean that they prefer a physical on-premises solution to the cloud if they feel that this gives them more control over security. Therefore, if a cloud services provider wants to win a customer's new workload, the cloud services provider must successfully compete not only with other cloud services providers but also with on-premises IT providers.

10. Furthermore, the competitive pressure exerted by on-premises IT providers extends from potential customers that are on-premises to existing customers of cloud services providers, with many customers either switching or considering a switch from the cloud to on-premises or a hybrid cloud and on-premises infrastructure. We frequently see on-premises solutions as competition for customer workloads, amongst both existing on-premises customers and for established UK customers of cloud services, with some customers choosing to move away from AWS to on-premises solutions where they believe this suits their needs better. For example, Dropbox moved much of its data out of AWS to its own network of servers, in a switch from the cloud to a hybrid on-premises and cloud solution.[20] Walmart has also moved from the cloud to a hybrid solution by building its own network of servers to "*switch seamlessly between cloud providers and its own servers*."[21] FirstGroup plc,[22] a provider of transport services in the UK and North America, migrated workloads to AWS from on-premises and from a competing cloud services provider to improve performance and reliability. In fact, the Public First Survey shows that 46% to 53% of survey respondents currently use on-premises servers for storage, database management, running applications, back up and disaster recovery, with 29% of respondents having switched from cloud services to on-premises services.[23]

11. Such a high switching rate demonstrates the substantial competitive pressure of on-premises services on cloud services providers. The working papers do not adequately engage with these analyses, instead disregarding any use of third-party surveys while still relying on selective findings from the CMA's own surveys.[24]

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17 See https://aws.amazon.com/free/migration/.

18 See https://aws.amazon.com/dms/.

19 See https://aws.amazon.com/kubernetes/.

20 See https://dropbox.tech/infrastructure/magic-pocket-infrastructure; https://www.wired.com/2016/03/epic-story-dropboxs-exodus-amazon-cloud-empire/ (discussing Dropbox's transition from cloud to a hybrid solution).

21 See https://www.wsj.com/articles/walmart-amps-up-cloud-capabilities-reducing-reliance-on-tech-giants-11656000000 (discussing Walmart's transition from cloud to a hybrid solution).

22 See https://aws.amazon.com/solutions/case-studies/firstgroup/.

23 See https://www.publicfirst.co.uk/files/CCIA_Survey.xlsx.

24 CL Working Paper, paragraphs 3.104.

12. Even if a customer chooses not to switch from cloud services to on-premises services (for example, because they are happy with the quality and price being provided by their current provider), on-premises services still offer a clear alternative for existing or potential customers and the threat of switching back from cloud services to on-premises services therefore exerts significant competitive pressure on cloud services providers in respect of their existing customers. The Dropbox and Walmart examples are emblematic of the competitive constraint on-premises IT providers have on cloud services, including for existing customers of cloud services. The CMA's emerging view that customers migrate from on-premises to the cloud but not vice-versa is simply wrong.[25] The CMA should recognise the commercial reality as borne out by the evidence and accordingly treat on-premises IT providers as a genuine and continuing competitive constraint on cloud services.

Customers can and do multi-cloud and switch as and when they wish

13. All evidence points to the fact that customers can, and do, multi-cloud and switch, and IT providers are heavily commercially incentivised to ensure that customers are able to multi-cloud and switch between different IT providers, if and when they wish to do so. The working papers' preliminary unwillingness to accept the strong incentives that AWS and other cloud services providers must ensure that customers have the ability to multi-cloud and switch is based on their incorrect assumption that cloud services are homogenous.[26] Instead, cloud services providers compete aggressively to offer innovation by way of new features or services to customers. This means that, if a cloud services provider is unable to provide a specific solution being sought by a customer, that customer may seek to move some or all their workloads to another IT provider. Limiting customers' ability to switch workloads or multi-cloud by creating technical barriers could result in a customer moving all their workloads to another IT provider.

14. The recent developments in AI demonstrate how IT providers are incentivised to enable customers who want best-in-class inputs that may be chosen from different IT providers and, to the extent necessary, the ability to move between them. For example, as AI services enable instant business solutions and outputs, customers require the ability to reference data across different IT providers and choose applications for inference that sit over solutions across multiple environments. In addition, customers developing AI may want to use compute services of one provider and keep the data that will be used by the compute services with another IT provider, *e.g.*, because the customer prefers the other IT provider's security and resiliency. In light of this evidence, the emerging view in the CL Working Paper that multi-cloud usage is limited, and switching is uncommon, as well as the emerging view in the TB Working Paper that there are high barriers to multi-clouding and switching is wholly unsubstantiated and, often, based on an incorrect reading of the data available to the CMA.[27]

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25 CL Working Paper, paragraph 4.78.

26 TB Working Paper, paragraph 1.15.

27 CL Working Paper, paragraph 9.6.

15. Our incentive to enable customers to multi-cloud and switch applies not just when competing for new customers but also in relation to existing customers. The CMA's emerging view that cloud services providers are not incentivised to ensure interoperability and to lower technical barriers as they would risk losing existing customers is flawed. Indeed, it fails to recognise the stark reality that cloud services providers are more likely to lose customers if they do not support interoperability. This is because IT providers compete on a workload-by-workload basis even for existing customers. If a customer cannot host a third-party service on AWS or cannot have an AWS service interoperate successfully with a third-party service it wishes to use, the customer will simply switch the workload away from AWS to another IT provider or choose another IT provider for the specific workload in the first place. Ensuring interoperability therefore is essential for cloud services providers who wish to attract new workloads and maintain existing ones. Indeed, AWS's commitment to interoperability is an important reason why customers choose AWS in the first place. This incentive manifests in practice through the commercial decisions AWS and other IT providers take. For instance, despite containers making it easier for customers to switch workloads away from AWS, AWS has invested heavily in containerisation technology as customers expect to use such technology in conjunction with the IT provider of their choice, both to move applications to and from AWS's infrastructure. If an IT provider was to artificially maintain technical barriers on a particular service, customers would simply choose another IT provider for their IT needs.

16. The analysis of customer data, which the working papers rely on,[28] significantly underestimates the actual level of multi-clouding by customers, in particular as it fails to consider cloud services providers other than AWS, Google and Microsoft, and on-premises IT providers. In fact, customers can and do multi-cloud regularly, including between cloud services providers (both larger and smaller cloud services providers) and on-premises solutions. For example:

    a. The Flexera 2023 "State of the Cloud" Report shows that 87% of its respondents used multi-cloud;[29]

    b. Similarly, 98% of respondents to Oracle's "Multi-Cloud in the Mainstream" report currently use or plan to use more than one cloud services provider;[30] and

    c. According to Gartner, more than 80% of customers use multiple IT providers for different workloads and purposes.[31]

17. Despite compelling evidence demonstrating the prevalence of multi-clouding and switching, the working papers have placed limited evidential weight on these surveys, effectively dismissing any evidence that does not complement CMA's emerging views. [32]

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28 CL Working Paper, paragraph 3.64.

29 See https://info.flexera.com/CM-REPORT-State-of-the-Cloud. This included organisations from across the world who purchased services categorised as "IaaS, PaaS, and SaaS".

30 See https://www.oracle.com/a/ocom/docs/gated/451-research-multicloud-in-the-mainstream.pdf.

31 See https://www.gartner.com/smarterwithgartner/why-organizations-choose-a-multicloud-strategy.

32 CL Working Paper, paragraphs 3.105.

18. Furthermore, the CL Working Paper fails to consider that some customers choose to use one IT provider for infrastructure services for their own business reasons rather than because of any barrier to switching — the need and customer desire to multi-cloud, therefore, needs to be considered on a case by case basis.[33] For instance, some customers may prefer to use a single IT provider to avoid costs inherent to multi-clouding, as well as the challenges of increased data latency,[34] data governance issues,[35] or security concerns.[36] Indeed, the customers' principal concern is having *the ability* to multi-cloud or switch IT providers, whenever it makes technical or economic sense to do so, but neither the need nor the desire to do so will always be there. The proportion of current multi-clouding cannot be the metric for assessing ease of switching or multi-clouding, as it completely disregards the fact that customers are often happy with their IT provider and see no need to multi-cloud or switch.

19. To assist customers that want to switch between different IT providers, AWS has invested heavily in solutions that allow customers to switch, should they wish to do so, including, for example, AWS Application Migration Services,[37] AWS Database Migration services,[38] Kubernetes,[39] and direct connections to on-premises environments from AWS, point-to-point connections, and site-to-site VPNs, among many other investments. For example, if a customer was seeking to switch their IT provider in 2005, they would have had to undergo a very manual process involving both significant time and manpower from both AWS and the customer to ensure that the switch took place. As a result of significant AWS investments into switching, customers are now able to use AWS applications such as the Application Migration Services and AI Coding Assistant[40] to help automate many of the complex IT processes necessary for switching in any technological industry. This has significantly cut down the manpower and time it takes to switch IT providers. When assessing these investments and their effect on the level of switching, the working papers have failed adequately to consider that some customers do not want to switch because they are happy with

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33 CL Working Paper, paragraph 3.33.

34 When a single solution is spread between multiple cloud services providers, information may need to flow many hundreds of miles across the internet to move between services. This increases latency and cost due to the additional time it takes to transfer data between cloud services providers.

35 Having data flow constantly between different systems creates data governance issues. For example, key requirements for an application analysing high-volume transactions include recording and analysing transactions reliably, quickly, and in the order that they occur. However, any data transfer between cloud services providers will not only increase latency, but also challenge the users' ability to track data lineage, and risk introducing data drifts.

36 When a single solution is spread between multiple IT providers, the solution components need to communicate with each other through multiple gateways, which may increase the risk of misconfigurations or other errors that could lead to leaks or losses of data.

37 See https://aws.amazon.com/free/migration/.

38 See https://aws.amazon.com/dms/.

39 See https://aws.amazon.com/kubernetes/.

40 See https://aws.amazon.com/q/developer/?gclid=EAIaIQobChMIgcKDr7XlhgMVgJBQBh3GCwciEAAYASAAEgIg5PD_BwE&trk=6ae1a2e1-f658-4e5b-9369-1049be12d384&sc_channel=ps&ef_id=EAIaIQobChMIgcKDr7XlhgMVgJBQBh3GCwciEAAYASAAEgIg5PD_BwE:G:s&s_kwcid=AL!4422!3!698165420143!e!!g!!codewhisperer!21048269256!162057017895 .

their current IT provider, and that there are inherent technical barriers to switching (and multi-clouding), which cannot be fully resolved without high innovation costs. By the CMA's own estimates, AWS's share of supply of cloud computing services has decreased from 2019 to 2022.[41] This decrease in AWS's share of supply has further accelerated in 2023, a fact which the CMA has disregarded with no justification. This drop in share of supply of cloud services, as estimated by the CMA, further demonstrates that, when customers are willing to switch, they can do so. This conclusion is further reinforced by the fact that, as AWS pioneered the development of cloud services, at one point it held 100% of the cloud services segment and has since dropped significantly lower to between 40 and 50% by 2022, by the CMA's own estimates.[42]

The working papers misunderstand or disregard the key role of innovation now and for the future

20. Innovation plays and will continue to play a significant role in deciding how new cloud services are designed, and existing services improved upon, by AWS and other IT providers. The CL Working Paper recognises this.[43]

21. The incentive to innovate, propelled by customer demand, is the driving force behind AWS's design decisions and we are therefore constantly innovating in a bid to keep up with customer demand:

    a. As a very recent example, we hosted a showcase of customer-driven investments and innovations at re:Invent 2023, where we announced the launch of 3 new services and 230 new features. AWS re:Invent is a learning conference for the global cloud computing community, with keynote announcements, training and certification opportunities, access to 2,000+ technical sessions, etc. Our teams work relentlessly to meet customer expectations of continuous new product and feature innovations that we have delivered each year and must continue to deliver.

    b. The blistering pace of innovation around generative AI provides another recent example of the vigorous competition between IT providers to rapidly innovate new product areas and differentiate their offerings based on quality and feature improvements, and enable interoperability between their own services and third-party services as customers want the best-in-class solutions that may be chosen from different IT providers. For example, AWS recently launched Amazon Bedrock, which like other offerings providing access to foundation models ("**FMs**"), allows customers to experiment with high-performing FMs from leading AI companies, making it easy for organisations of all sizes and across industries to access, experiment with different FMs, and integrate the model best suited to their needs into their applications. Amazon Bedrock became generally available on 28 September 2023. We launched EC2 Capacity Blocks in October 2023, which enables customers with high-performance ML workloads to reserve GPU computing servers for short periods of time, so that developers have predictable and timely access to cost-efficient compute capacity when they need it. Competition is fierce and other providers

41 CL Working Paper, paragraph 5.17.

42 CL Working Paper, paragraph 5.16(a).

43 CL Working Paper, paragraphs 6.12 to 6.15.

have launched similar innovative offerings to attract and support AI and ML workloads. And in November 2023, we launched Amazon Q, a generative AI-powered assistant, which customers can use to generate guidance tailored to their business through a simple conversational interface and supports over 40 data source connectors, with 75% of these being connectors to third-party services.[44] If we had only supported connectors to AWS's own services, customers would not have adopted Amazon Q, demonstrating that we have a strong commercial incentive to ensure interoperability with other IT providers' services. IT providers are investing heavily in developing new generative AI services, both on-premises and in the cloud, because customers exert significant pressure on providers to innovate to keep up with competitors. This is competition at its best.

22. The CMA itself acknowledges, in relation to its draft guidance on the proposed approach to finding an AEC,[45] that it needs to consider whether AWS's competitive position is based on the merits of its services and its desire to continuously innovate. If AWS failed to either innovate itself or ensure that its cloud services were interoperable with new innovations by others, customers would switch to other IT providers, weakening AWS's market position.

23. However, despite the CMA recognising the continuing importance of innovation in cloud services, the CL Working Paper states that it is difficult to evaluate evidence on quality and innovation in cloud services, and it is not possible to assess whether the current levels of innovation and quality will persist.[46] The ferocity of competition and the constant drive to provide new innovative services to customers (both in relation to AI workloads and beyond), leaves no doubt that innovation will continue to be a competitive parameter for cloud services in the future. In any event, if the CL Working Paper is unable to articulate a counterfactual producing better market outcomes, then the CMA should refrain from any intervention. This is particularly true in innovative and dynamic industries, such as the provision of cloud services, where regulatory intervention might unwittingly stifle new innovation.

Other cloud services providers are an essential part of the competitive landscape

24. Smaller cloud services providers can and do have a significant impact on the availability of cloud services for customers and on the competitive landscape for IT providers. For instance, the CL Working Paper recognises,[47] an increasing number of specialised cloud services providers have recently entered or expanded in this space to offer compute for AI developers, including FluidStack (headquartered in the UK), CoreWeave, Lambda Labs, San Francisco Compute, Genesis Cloud, Denvr Dataworks, G42, Omniva, Cirrascale, Yotta Data Services, Gcore, Voltage Park, Crusoe Cloud, JarvisLabs.ai (all of which provide enterprise-grade access to NVIDIA's GPUs), Evroc, TensorWave, Aligned, RunPod, Supermicro, Paperspace, Akash Network, Foundry, and many others, all of which compete both amongst themselves and with larger IT providers for customer workloads.

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44 See https://docs.aws.amazon.com/amazonq/latest/qbusiness-ug/connectors-list.html

45 CMA Draft digital markets competition regime guidance, paragraphs 2.16 and 4.12.

46 CL Working Paper, paragraph 6.22.

47 CL Working Paper, paragraph 8.33.

25. The CMA's emerging view is that smaller providers are not an effective alternative to large providers.[48] Yet, the CL Working Paper itself recognises that small cloud services providers should be seen as suitable alternatives for workloads and that smaller cloud services providers all have strong offerings in relation to certain use cases or customer types.[49] Furthermore, given that competition for cloud services occurs on a workload-by-workload basis rather than per customer, smaller cloud services providers do not need to be a complete alternative to larger providers but only to meet customer needs on a workload-by-workload basis, meaning that their size is not a hindrance to them acting as a significant competitive constraint and challenge to any large IT provider.

26. In light of the impact of smaller cloud services providers on the competitive landscape for the supply of cloud services, the CL Working Paper's decision to exclude them both from its qualitative analysis and its quantitative analysis of the competitive landscape means that its emerging views fail adequately to appreciate competition in the supply of IT services. For instance, the CL Working Paper stated that if customers can easily switch and multi-cloud, "*smaller cloud providers may be able to more easily enter, and expand by, for example, focusing their offer on certain niche products*."[50] The influx of new smaller cloud providers offering new services to customers is therefore a clear indication of customers having the ability to easily switch and multi-cloud. Furthermore, by excluding smaller cloud providers from its analysis of customer data,[51] the CL Working Paper effectively misconstrues the actual competitive dynamics of the market so as to consider smaller cloud providers not to exist — a significant oversight given their importance.

48 CL Working Paper, paragraph 2.149.

49 CL Working Paper, paragraph 6.22.

50 CL Working Paper, paragraph 3.7(a).

51 CL Working Paper, paragraphs 3.71(d) and 3.109.

AWS's DTO fees are not a barrier to switching or multi-clouding, and the EF Working Paper does not articulate a compelling theory of harm

27. DTO fees are not a barrier to switching or multi-clouding, and compelling evidence points to the fact that customers agree. We design our services, including the underlying network infrastructure that underpins them, to give customers the freedom to choose the technology that best suits their needs. If a customer decides to move to another IT provider, we want them to be able to do so. This is because our focus is on building long-term customer trust, and that freedom makes AWS attractive to new and returning customers.[52] DTO fees, which AWS only charges in some instances (as explained at paragraph 29 below), are a necessary cost to enable AWS to provide customers with a premium data transfer service that runs on top of a premium network, a distinctive factor and a key reason why customers choose us to provide their cloud services. Qualitative customer research by Jigsaw confirms that, of the participants who switched providers, none of them considered DTO fees as the main or even one of the main barriers to switching.[53]

28. From the outset, we should clarify that AWS does not charge "egress" fees — that is, fees for switching data to another IT provider. We charge a service fee for using our network to transfer data within or out of AWS, and only in certain instances.

29. Since 2010, we have provided our customers with a free tier of usage for more than 100 AWS services up to specified limits, including DTO. This includes the dramatic expansion of free data transfers out from our network from 1 gigabyte per month to 100 gigabytes per month as of December 2021.[54] As a result of this expansion, more than 90% of AWS's global customers which incur DTO usage do not pay DTO fees at all. In addition, as of March 2024, we have eliminated DTO fees globally (including in the UK) for switching customers, which removes one of the EF Working Paper's two potential concerns around DTO fees. For multi-cloud, the EF Working Paper has not advanced evidence that suggests DTO fees are a barrier for those customers that want to multi-cloud. Therefore, remedies in relation to DTO fees would not solve any perceived concern, and would in fact lead to harmful, unintended consequences — including reduced investment in innovation, reduced price competition and unequal treatment of customers, given that any reduction in DTO fees (and associated changes to recoup these costs) would likely benefit customers with higher data transfer volumes to a much greater extent than customers who transfer less data.

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52 See https://aws.amazon.com/blogs/networking-and-content-delivery/promoting-customer-choice-aws-takes-another-step-to-lower-costs-for-customers-changing-it-providers/.

53 Jigsaw: Cloud Services Market Investigation Qualitative Customer Research – Final Report, May 2024, paragraph 5.2.2; EF Working Paper, paragraphs 2.46 and 2.65.

54 See https://aws.amazon.com/blogs/aws/aws-free-tier-data-transfer-expansion-100-gb-from-regions-and-1-tb-from-amazon-cloudfront-per-month/. This also includes 1 terabyte per month of free data transfer from Amazon CloudFront to the Internet.

30. In instances where we do charge customers for transferring data, we typically charge a per-gigabyte fee, which is an efficient pricing model to ensure that customers pay data transfer fees only for their actual network usage (after consuming their free 100 gigabytes per month for external data transfers). A business model which charges based on the volume of gigabytes that a customer transfers means that businesses that transfer large amounts of data on a recurring basis will incur greater fees for their usage of the AWS network, while businesses that use less of the network for data transfer will pay less — this is fair, economically justified, and pro-competitive.

31. Further, we price according to our costs. The EF Working Paper seems to fundamentally misunderstand that these costs differ between internal and external transfers. For external transfers, these encompass far more than the internet transit and peering costs suggested by the EF Working Paper. Although internal data transfer and DTO make use of the same data centre and network assets, AWS apportions cost based on usage, and our per-GB costs are higher for DTO than internal data transfer. We will continue working with the CMA to make this clear.

32. These fees have enabled us to invest in high-quality proprietary infrastructure to provide a premium service, which we think is the best network offering in terms of security, scalability, and resiliency. That quality differential entails additional investments and therefore higher costs. AWS's continuous investment in physical infrastructure has yielded tremendous benefits to customers and the UK economy as a whole, and these investments should be encouraged and compensated rather than scrutinised. Regulation which prevents our ability to make these investments would lead to reduced innovation and poorer outcomes for UK businesses.

33. The EF Working Paper states that it has seen limited evidence of customers receiving lower prices or greater choice or innovation for data transfer services as a result of investment funded by DTO revenues.[55] This simply cannot be true for AWS — we have built a first-in-class global network by investing tens of billions of dollars in proprietary networking solutions, such as custom semiconductors, equipment and software, and millions of miles of terrestrial and undersea cable. Between 2020 and 2023 alone, network capacity at the AWS internet edge — where the AWS network interfaces with the internet — has grown 3x, and our backbone capacity has increased 2.5x. To give a sense of the scale of these investments, we invested over USD 3 billion in our global network in each of 2021 and 2022 — of which USD 1 billion contributed to building a total metro fibre network that can go back and forth to the moon six times. This enables us to save costs which help us to deliver more capacity to customers and allow us to drive innovation on the internet border.

34. As a result of these investments, we offer a service which improves transfer speeds, reduces lag, and increases security and reliability across the entire AWS global network (ensuring 99.999% availability). The network is designed to withstand multiple overlapping failures, and all data flowing across AWS Regions is automatically encrypted before it leaves our secure facilities. Customers recognise this: when assessing the most secure cloud storage solutions, we are

[55] EF Working Paper, paragraph 4.88.

described as one of the "one of the best supported platforms" where users "can benefit from strong network architecture" developed for "security-sensitive enterprises".[56]

35. The DTO fees that we charge are not a barrier to switching or multi-clouding:

    a. Competition in the IT services market incentivises firms to become more efficient and to pass cost savings on to customers. Even before we made DTO free for switching customers, AWS always sought to — and continues to — reduce DTO costs and pass these savings on to customers through innovation in its network, services, and tools to assist migration and multi-clouding. Indeed, our fees for transferring data out to the Internet fell over 30% globally between 2018 and 2022. Thanks to investments that AWS has made in its network, between 2019 and 2022, customers experienced a near $0.01 reduction in prices for every $0.01 reduction in per unit DTO cost, which reflects a pass-on rate of near 100%. It is imperative that the CMA considers the declining rate of DTO fees in its assessment of whether DTO fees represent a barrier to switching or multi-clouding, which it has not done as part of the EF Working Paper.[57]

    b. Price comparisons with other providers[58] are flawed where they ignore (i) cost and quality differences in the network offering or (ii) that other providers also charge for network usage but in a different way (namely by incorporating charges into the prices of other services). Other providers are well within their rights to choose a business model which offers lower quality and therefore lower costs, or which incorporates the cost of DTO into the price of other services. However, that is not the business model that we have chosen, nor one which would benefit our customers, and we should not be penalised for that.

    c. The prevalence of multi-clouding suggests that DTO fees are not a barrier for those customers that do want to multi-cloud, and most participants of Jigsaw's customer research agree that DTO fees are rarely the main reason why participants do not consider a multi-cloud strategy or migration to another provider.[59] It is also important to note that multi-clouding is not cost-free (even without DTO fees) and is not always the optimal choice for all customers. Indeed, neither Ofcom nor the CMA have determined what the optimal level of multi-clouding should be, and thus it is not possible to determine whether current levels are below optimal. Customers will adopt a multi-clouding strategy if it suits their objectives, and the EF Working Paper does not advance evidence which suggests otherwise.

    d. Moreover, the working papers appear to use evidence selectively, to support unwarranted conclusions, even where the evidence directly contradicts the conclusions reached. For example, of the customers who were, in the CMA's emerging view, able to give an "informed" view on switching, "only a few… spontaneously identified egress fees

[56] See https://backupeverything.co.uk/what-are-the-most-secure-cloud-storage-solutions/#:~:text=Alleviates%20Data%20Security-,Amazon%20Web%20Services,-AWS%2C%20Amazon.

[57] EF Working Paper, paragraph 1.34.

[58] See, for example, EF Working Paper, Figure 1.2.

[59] Jigsaw: Cloud Services Market Investigation Qualitative Customer Research – Final Report, May 2024, paragraph 5.3.7.

as a challenge".[60] In fact, many interviewed customers "had never considered switching because they were satisfied" with their current provider,[61] and Jigsaw's customer research states that "across the sample, almost no participant considered egress fees to be a factor in their cloud provider choice".[62] Despite this evidence, the EF Working Paper speculates that "customers are not complaining about egress fees, although such fees may nonetheless have affected their switching behaviours".[63] The evidence clearly indicates that DTO fees are a minor consideration for customers thinking about switching and multi-clouding, rather than a material barrier.

36. All of the above means that the remedies potentially considered in the EF Working Paper — which include banning or capping DTO fees, or an information transparency remedy — are unnecessary and unjustified. Given that DTO fees are not a barrier to switching or multi-clouding — as Jigsaw's customer research shows[64] — these remedies would not solve any potential concern (particularly given that DTO for switching customers is already free), but they could instead lead to unintended consequences. Building and using our premium network is costly, and banning or capping DTO fees would not simply make these underlying infrastructure costs disappear. Instead, we (and potentially other cloud services providers) would have to recoup these costs elsewhere, by raising the prices of other cloud services. This means that customers with lower network usage would likely have to subsidise those with higher usage, effectively making cloud services more expensive for customers with lower usage. Such remedies would be disproportionate and lead to perverse outcomes negatively impacting customers — the very opposite of what the CMA is trying to achieve.

60 Jigsaw: Cloud Services Market Investigation Qualitative Customer Research – Final Report, May 2024, paragraph 2.39.

61 Jigsaw: Cloud Services Market Investigation Qualitative Customer Research – Final Report, May 2024, paragraph 2.41.

62 Jigsaw: Cloud Services Market Investigation Qualitative Customer Research – Final Report, May 2024, paragraph 5.1.3.

63 EF Working Paper, paragraph 2.37.

64 Jigsaw: Cloud Services Market Investigation Qualitative Customer Research – Final Report, May 2024, paragraph 5.2.2; EF Working Paper, paragraphs 2.46 and 2.65.

Committed spend discounts [65] are pro-competitive and directly benefit customers

37. We welcome that the CSA Working Paper acknowledges the indisputable fact that discounts can be beneficial for customers.[66] Discounts, by definition, directly benefit customers and are pro-competitive. CSDs are a form of volume discounting, a common business practice in most industries, including across IT services. Regulatory agencies have long recognised that such practices pass efficiencies on to customers, lower prices, and enhance competition. We agree.

38. CSDs have clear pro-competitive effects: they are a vehicle of price competition between suppliers, directly benefiting customers with lower prices, and they help IT providers better plan and acquire necessary capacity and infrastructure, generating efficiencies across the industry. These efficiencies benefit all customers regardless of whether they have a CSD, and we pass them along as price reductions whenever possible.

39. In addition, CSDs promote customer choice and switching. They are one way that many IT providers across the industry provide discounts and one of the main ways in which they compete to attract new workloads. Any restrictions on the discounts that cloud services providers can offer to compete could therefore result in *less* switching if this becomes more costly for customers. Moreover, CSDs empower customers to achieve cost savings from the start of their contract, ensuring they obtain the best, most competitive deal available, and give them predictability to better plan and manage their IT solutions.

The CSA Working Paper is based on an erroneous understanding of AWS's pro-competitive volume discounts

40. The CSA Working Paper reflects a fundamentally flawed understanding of AWS's CSDs and presents them as akin to "exclusivity" rebates that could harm competition. This is incorrect. Our discounts are volume discounts that offer great value for customers and promote price competition. We provide customers with the option of making an upfront commitment to use a certain volume of AWS services in exchange for a discount to our pay-as-you-go pricing.

41. In particular, the CSA Working Paper mischaracterises and misunderstands how our CSDs work in practice.[67] CSDs are not conditional on customers using AWS exclusively. We design our services to give customers the freedom to build the solution that is right for them, with the technology of their choice. With numerous competitive alternatives available, we offer AWS services to help solve customers' IT needs. As a form of volume discounting, we provide lower prices (*i.e.*, higher discounts) for larger volume spend commitments. Discounts are driven by customers who decide

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[65] CSA Working Paper, paragraph 1.1: "Committed spend agreements/discounts ("CSAs/CSDs") are agreements between a cloud provider and a customer in which the customer commits to spend a minimum amount across the cloud provider's cloud services over a period of years, and in return, receives a percentage discount on its spend with that provider during those same years."

[66] CSA Working Paper, paragraphs 1.9, 2.103 to 2.113.

[67] CSA Working Paper, paragraphs 2.65 to 2.81, 2.102.

how much of AWS's services they want to use and who want to benefit from the volume of services that they would have used regardless by securing greater discounts with upfront certainty. While the specific terms will depend on the customer's specific needs, the discounts we offer generally correspond to the spend amount the customer chooses to commit, regardless of what proportion of a customer's total demand that is.

42. The pricing structure of our discounts cannot give rise to harm to competition.[68] The structure and level of our discounts are such that efficient competitors — even those who are *less* efficient than AWS — can compete for customers' incremental demand.[69] As with all volume discounts, discounts increase as volumes increase. And customers can place any of their demand with another IT provider without losing out on a material discount if they prefer those alternative services. Therefore, the hypothesis that our discounts could reduce the ability or incentive of rival suppliers to compete or lead to the weakening or marginalisation of some suppliers[70] does not hold.

The analysis in the CSA Working Paper does not show any harm to competition

43. The CSA Working Paper acknowledges that discounts can only give rise to competition concerns under certain conditions and/or when structured in certain ways [71] and that the CMA has not reached any conclusions on whether CSDs can harm competition.[72] However, the CSA Working Paper does not articulate a compelling theory of harm, and the evidence it relies upon does not substantiate any hypothetical theory of harm based on economic theory. Based on the analyses in the CSA Working Paper, the only conclusion that the CMA can reasonably reach is that CSDs benefit customers and do not give rise to any adverse effects on competition.

44. Fundamentally, the analysis set out in the CSA Working Paper only demonstrates that customers care about discounts and that discounts increase as volumes increase. It acknowledges that *"the extent to which [the link between 'sticky' and 'contestable' demand] actually drives any competition concern is an empirical question and depends on the assessment of a set of factors*." (emphasis added)[73] However, neither the framework adopted in the CSA Working Paper[74] nor the evidence it presents proves any adverse effects on competition.

45. To be problematic from a competition perspective, discounts must be at least capable of foreclosing efficient rivals, outweighing their pro-competitive effects and benefits for customers. The CSA Working Paper has not evidenced any such risk to competition — indeed, the CMA's

68 CSA Working Paper, paragraphs to 2.43 to 2.102.

69 As referenced in the CSA Working Paper at, *e.g.,* paragraph 2.46(c).

70 CSA Working Paper, paragraph 1.11.

71 CSA Working Paper, paragraphs 1.9 and 1.11.

72 CSA Working Paper, paragraph 1.4.

73 CSA Working Paper, paragraph 1.19.

74 CSA Working Paper, paragraphs 1.9 to 1.22.

emerging views are characterised by a lack of compelling evidence on all fundamental points of the legal framework used for the assessment of discounts under competition law.

a. The analyses in the CSA Working Paper do not evidence harm to competition based on economic theory, as they do not distinguish between pro-competitive discounts and discounts that give rise to competition concerns. For example, what the CSA Working Paper presents as a theory of harm[75] is simply the definition of volume discounts: that discounts increase as volumes increase. In particular, the assessment of incremental discount rates in the CSA Working Paper does not demonstrate any actual or potential foreclosure of competitors:[76] a (median) discount increase of a certain percentage upon renewal in exchange for a (median) commitment increase of a certain percent percentage only shows that our discounts increase with volumes.[77] Such volume discounts are pro-competitive in almost all cases, as customers get higher discounts as firms compete for higher volumes. Discounts only give rise to potential competition concerns if it is shown that such discounts mean rival cloud services providers cannot profitably compete (together with several other conditions that must be met), which the CSA Working Paper does not assess. None of these analyses prove a capability to foreclose competition, let alone actual harm to competition.

b. The empirical evidence presented to support the CMA's emerging views is circumstantial, selectively read, and largely anecdotal. At the same time, the CSA Working Paper has not provided compelling evidence about customers' views on CSDs and dismisses the fact that most customers view discounts positively,[78] as well as clear, positive customer evidence from responses to the CMA's issues statement highlighting their pro-competitive effects.[79]

c. The CSA Working Paper focuses on AWS and Microsoft and ignores or downplays the effects of other IT providers competing on discounts and prices.[80] At the same time, without explanation, it appears to treat AWS and Microsoft as a single entity with singular aims and discount structures, disregarding the intense competition between them.[81]

46. To assess whether CSDs can prevent, restrict, or distort competition, the CMA must (1) set out a test for foreclosure rooted in economic theory, (2) apply the test based on real data and considering all evidence, and (3) analyse the results of the test to conclude whether the hypothesis

75 See, *e.g.*, CSA Working Paper, paragraph 1.10(c).

76 CSA Working Paper, paragraphs 2.82 to 2.93.

77 See, *e.g.*, CSA Working Paper, paragraph 2.90.

78 CSA Working Paper, paragraph 1.41.

79 CSA Working Paper, paragraph 1.40; Startup Coalition's response to the issues statement dated 17 October 2023, page 2; CCIA's response to the issues statement dated 17 October 2023, page 3; and ACT's response to the issues statement dated 17 October 2023, page 5.

80 CSA Working Paper, *e.g.,* paragraphs 1.6, 1.34.

81 CSA Working Paper, *e.g.*, paragraph 2.13.

empirically holds in this case. We've shown that this hypothetical concern does not hold in our submissions referenced in the CSA Working Paper,[82] to which the CMA has a duty to give due consideration.

Remedies are not warranted and would lead to significantly negative unintended consequences for customers

47. The type of discounts we offer are commonplace in many different industries and are widely recognised as efficiency-enhancing. There is no evidence that such discounts give rise to adverse effects on competition or contribute to any alleged barriers to switching or multi-clouding. They are a feature of a "well-functioning market" where suppliers compete vigorously on price among other factors. Consequently, any regulatory intervention that impacted AWS's ability to offer discounting would be unwarranted.

48. At the same time, the potential remedies being considered in the CSA Working Paper are not only unnecessary interventions in a well-functioning market but would have significant unintended consequences, in particular resulting in higher prices for UK customers. For example, the CSA Working Paper recognises that any restrictions on the level of discount that a cloud provider could offer may result in customers paying more, either in the short or longer term, directly harming customers and competition.[83] CSDs provide ongoing cost reductions for customers to more efficiently run and grow their businesses. Any intervention that results in UK customers paying higher prices, particularly vis-à-vis customers outside the UK, would make it more difficult for them to grow and compete.

49. The CSA Working Paper rightly recognises that its proposals to restrict discounts could lead to unintended consequences such as smaller discounts for customers or reduced investment in new data centre capacity as a result of the reduced certainty about their future demand.[84] This is exactly what would happen with regulatory intervention that would impact AWS's ability to provide CSDs to customers — reduced certainty in demand would considerably affect AWS's investment decisions, and would limit our ability to create efficiencies that benefit our customers.

50. The proposal to ban the use of commitments would directly harm customers. Suppliers offering customers discounts based on commitments is pro-competitive and reflects the bargaining power of customers. By obtaining commitments from customers, IT providers are more willing and able to provide customers with greater discounts from the start of the contract, as they have certainty that customers will spend the amount that corresponds to the discount afforded to them. Removing this option would limit customers' ability to receive larger discounts from the first dollar they spend from the start of their CSD contract. This would likely lead to higher prices for all customers who currently have CSDs, an effect that could be particularly harmful for smaller

82 CSA Working Paper, *e.g.,* paragraph 2.46.

83 CSA Working Paper, *e.g.*, paragraph 3.32.

84 CSA Working Paper, paragraphs 3.21, 3.31, and 3.38.

customers, such as start-ups, with more limited financial means, and, as a result, such a ban risks hampering wider innovation in the UK.

51. The CSA Working Paper acknowledges the possibility that requiring providers to publish their discount structures could result in 'standardised' discounts and a softening of competition.[85] What the CSA Working Paper fails to acknowledge is that the same exact risks would result from any restrictions around the structure of volume-related discounts. CSDs are an important tool for price competition between IT providers for new and existing workloads, and reducing suppliers' flexibility to price competitively and differentiate with discounts would reduce competition. At the same time, requiring cloud providers to follow the published discount structures and therefore restrict the ability to negotiate discounts would weaken the bargaining power of customers and their ability to negotiate lower prices.[86]

52. Further, considering potential remedies that could only apply to AWS and Microsoft based on alleged "market power" is misguided and would lead to a significant distortion of competition.

[85] CSA Working Paper, paragraph 3.48(a).

[86] CSA Working Paper, paragraph 3.48(b).

Software Licensing Working Paper

53. We are encouraged by the CMA's attention on Microsoft's anti-competitive licensing practices and its emerging views. We support the Principles of Fair Software Licensing and are encouraged by the CMA's considerations on how best to ensure that customers can select the IT provider of their choice to run Microsoft's immensely popular and critical productivity software, which competition authorities have found in the past to have a very substantial degree of market power.[87] Software licensing issues are distinct from the rest of the CMA's emerging views in the working papers as they relate to Microsoft leveraging its legacy, "must-have" productivity software to restrict customers' ability to work with the IT provider of their choice. Unlike Microsoft, most of the other IT services providers do not tend to have "must-have" legacy software that could be leveraged to distort competition to the detriment of customers. Indeed, licensing practices should not be leveraged to artificially restrict customer choice and make switching more difficult.

54. When Microsoft changed its licensing terms in 2019 and again in 2022, it made it more difficult for customers to run some of its popular productivity 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 licence even if they already own a licence for the software. A study by Professor Frédéric Jenny published on 22 March 2023 estimated that the first-year extra cost caused by customers needing to repurchase existing BYOL Microsoft 365 software licences to be used 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.*" Microsoft has acknowledged customers' concerns, but rather than fix its policy so all IT customers can run Microsoft's software on the cloud services provider of their choice, as it was before, it has unilaterally decided to lift some burdens for certain IT customers while preventing others from being able to run Microsoft's software on specific workloads or specific cloud services providers' infrastructure. For example, customers are still not able to BYOL their Microsoft software and run it on shared hardware when using Google Cloud, AWS, and Alibaba. This is despite shared hardware being the industry-standard for cloud services, and it being significantly more expensive and inefficient to allocate dedicated hardware to an individual customer. Shared hardware facilitates pooled resources that can be dynamically allocated among many customers as their respective individual needs fluctuate and scale over time.

55. While AWS is pleased that its customers will now be able to bring their own existing Microsoft 365 licences for use on one particular service (Amazon Workspaces), this does not resolve its customers' continued concerns over use of Microsoft's numerous critical software products using

[87] See, for example: European Commission, Digital Markets Act Impact Assessment support study - Annexes, p. 170, and European Commission, decision of 6 December 2016, Case M.8124, para. 293 et seqq. In addition, according to Gartner, Microsoft has held a very high, stable share (between 90-100%) for a very long time in the supply of productivity software for PCs globally – see https://blogs.gartner.com/craig-roth/2021/07/30/should-microsoft-office-365-be-afraid-of-google-workspace-gartner-2020-market-share-report-says/.

the IT infrastructure of their choice. These barriers can be eliminated by Microsoft (and Microsoft only) simply by changing its licensing terms.

Technical Barriers Working Paper

56. The potential interventions considered in the Technical Barriers Working Paper ("**TB Working Paper**") are unnecessary and potentially harmful as (i) the TB Working Paper has not actually established that technical barriers prevent customers from switching or multi-clouding in any way that is capable of harming competition; (ii) while there may be some inherent technical barriers, these cannot be resolved through regulatory intervention; and (iii) the remedies proposed to remove these inherent technical barriers are disproportionate and would harm customer choice and innovation.

57. While there will always be some inherent technical barriers, the introduction of cloud services by AWS and cloud services providers' efforts to support interoperability have made switching between IT providers easier than ever before, especially when compared to the costs and efforts customers used to incur when switching between providers of non-cloud IT services.

58. For example, 20 years ago, migration typically involved moving from one data centre to another, physically moving equipment to the new location. Data and software would have to be restored, with failures manually rectified over a long period. Since the introduction of cloud services, virtualisation has removed the need for physical transfer of hardware. Over the years, providers have been incentivised to support a wide range of operating environments, database types, storage types, and containers, to enable customers to replicate existing setups when switching without the level of manual work historically required. In addition, providers have invested in automation and tools to enable easier migration, allowing transformation between virtualisation layers and between operating systems, amongst others, or supporting portable infrastructure-as-code deployments. As a result, customers today have an unprecedented degree of flexibility in choosing, combining, and switching between IT providers to achieve the customer's desired IT solutions. We expect artificial intelligence to accelerate the ease with customers can switch, by automating code development and other technical tasks that are inherent in any change of IT services provider.

The CMA has not shown that technical barriers prevent switching or multi-clouding

59. The emerging views reflected in the TB Working Paper, namely that high technical barriers hinder switching and multi-cloud, are not supported by the evidence collected in the TB Working Paper or by reputable third-party sources.

60. The TB Working Paper includes but ultimately disregards strong evidence showing that customers can switch and multi-cloud when they need to.[88] For example, in the TB Working Paper, customers report that "*they experienced minimal barriers to integration across multiple public clouds.*"[89] With regard to feature differentiation, the CMA recognises that "*customers had mixed views on whether there are differences in the features of comparable core services across clouds that make*

[88] TB Working Paper, paragraph 4.17.

[89] TB Working Paper, paragraph 4.14.

it harder to use multiple clouds or switch."[90] Furthermore, third-party surveys and anecdotal customer feedback beyond that collected by the CMA, demonstrates that customers can switch and multi-cloud and are not limited by technical barriers in doing so (with the exception of Microsoft's anti-competitive licensing practices).[91]

61. Moreover, as explained in paragraphs 14 to 15 above, cloud services providers have, and will continue to have, strong commercial incentives to lower technical barriers and support interoperability.

Inherent technical barriers cannot be resolved through regulatory intervention

62. Common technical barriers relating to latency,[92] skill gaps,[93] and feature differentiation[94] are inherent to IT services and are not specific to cloud services. For example, switching between clouds or with other IT providers will sometimes require time and effort to re-design and re-engineer workloads due to technical differences between IT environments, including between clouds and between clouds and on-premises technology, which would be true in any technical arrangement. The TB Working Paper has not presented any evidence of cloud services providers intentionally imposing artificial technical barriers to prevent customers from switching or multi-clouding and we at AWS think carefully about how best to minimise technical barriers as part of our design decisions.

63. Customer feedback indicates that a switch between cloud services providers would cost a similar (if not less) amount to the initial migration from on-premises IT infrastructure to a cloud services provider.[95] This further supports that these costs are inherent to IT services, despite the mitigation efforts undertaken by cloud services providers. Indeed, the CMA's Updated Issues Statement itself recognises that in a well-functioning market (*i.e.*, where no intervention is required), "*customers may still face some sources of friction when exercising their choice of cloud provider, […], due to any intrinsic features*."[96]

64. Furthermore, the perceived concerns around feature and interface differentiation of IT services between providers are unwarranted.[97] These differences are reflective of a healthy level of competition as they indicate high levels of innovation and customer choice and should therefore be encouraged rather than viewed as a reason for regulatory intervention. IT services are not

90 TB Working Paper, paragraph 5.6.

91 See paragraphs 13 to 19 above.

92 TB Working Paper, paragraph 7.19.

93 TB Working Paper, paragraph 7.30.

94 TB Working Paper, paragraph 5.32.

95 TB Working Paper, paragraph 4.26. While the CMA has not examined the initial migration costs from on-premises to the public cloud, it seems to suggest that such initial migration has less technical costs. See TB Working Paper, paragraph 3.12 and Figure 3.1.

96 Updated issues statement, paragraph 86.

97 See TB Working Paper, paragraphs 5.16, 5.18, and 5.66.

undifferentiated goods and adjustments are part and parcel of switching IT providers. The TB Working Paper includes feedback from customers recognising that technical barriers may naturally result from fundamental differences in how cloud services providers approach cloud services.[98] For instance, at AWS, we have chosen to adopt three availability zones per region – the result being that we have different underlying infrastructure and related APIs to other cloud services providers, a choice driven by our view of how best to support our customers with greater availability and resiliency. While this may lead to some technical burden when switching between IT providers,[99] such as managing the transformation of software from different virtualisation layers (*e.g.*, Kernel-based Virtual Machine to VMware's ESXI server) and between different operating systems (*e.g.*, UNIX to Linux) or databases (*e.g.*, Postgre to SQL), our customers view our approach to cloud services as a key reason for choosing AWS.

65. In the TB Working Paper, customers also display differing and often contradictory views about technical barriers. For example, there is conflicting evidence on whether latency is a barrier to switching[100] and whether customers are required to change observability tools when switching or multi-clouding.[101] Views on technical barriers for ancillary services are also, at best, mixed.[102] These mixed and contradictory views illustrate that technical barriers are specific to each customer, as different customers value different aspects of cloud services, have different requirements, and face unique challenges depending on their use case. In other words, the existing technical barriers are not artificially imposed by cloud services providers across customers to prevent them from switching or multi-clouding but are inherent to IT services.

66. Even though the technical barriers are inherent to IT services, AWS and other cloud services providers have invested heavily to ensure that their impact on the ability of customers to multi-cloud and switch remains minimal. For example:

    a. Our open APIs and Software Development Kits ("**SDKs**"), as well as services such as Amazon ECS and Amazon EKS Anywhere, allow customers and third parties to build compatible software and solutions.

    b. We have invested heavily in security related solutions to assist customers in managing their security needs either when switching or when using IT services across different IT services providers. For example, we developed "Cedar", an open-source policy language and authorisation engine that defines fine-grained permissions, allowing customers to determine what person or systems should have access to IT resources or functions. We also launched Amazon Verified Permissions ("**AVP**"), which provides fine-grained permissions management capabilities for customer and ISV applications, backed by Cedar. This service, which can be used with third-party solutions outside of AWS, allows customers to express fine-grained permissions as easy-to-understand policies enforced in

98 TB Working Paper, paragraph 4.3.

99 TB Working Paper, paragraph 5.18.

100 TB Working Paper, paragraphs 5.6, 5.8, 7.12, and 7.25.

101 TB Working Paper, paragraphs 6.70 and 6.79.

102 TB Working Paper, paragraph 9.92.

customers' applications. Further, in conjunction with over a dozen security industry leaders and led by Splunk, we developed the Open Cybersecurity Schema Framework ("**OCSF**") to try and establish a commonly-agreed-upon schema for data sources among different security-focused IT solutions. As a co-founder of the OCSF effort alongside Splunk, we helped create the specifications and tools that are available to all industry vendors, partners, customers, and practitioners.

c. We have been at the forefront of developing technical solutions that allow customers to run their applications on AWS and still connect to other cloud services providers, or on-premises, for any application dependencies. For example, in 2017, we launched a managed Kubernetes service called Amazon Elastic Kubernetes Service ("**EKS**") to make it easier for customers to run the most popular open-source container orchestration software – Kubernetes – on AWS. Containers, including those orchestrated via Kubernetes, help support interoperability as they package applications into an industry standard format that are easily moved to another IT environment. The aim of EKS was to alleviate the operational burden connected with running Kubernetes for the customers who might find that useful – thereby encouraging customers to use the Kubernetes managed service. However, customers can also run the open-source version of Kubernetes on AWS directly using EC2, allowing them to maintain control over the provisioning and deployment of Kubernetes if they prefer. This significant investment in containerisation technology allows customers to multi-cloud and switch by porting applications between different environments with minimal technical barriers.

d. We also interconnect directly with many networks, including those of other cloud services providers, to help customers enjoy a reliable data transfer experience across different providers and networks. If a customer decides to move to another IT provider, we have invested heavily to remove barriers because our focus is on building long-term customer trust and removing these barriers makes AWS attractive to new and returning customers.

e. We already take many active steps to inform and educate our customers, explaining the programming language behind various tools that can be used to build on AWS and documenting the changes to the underlying open source of our managed open-source services.[103]

f. We constantly invest to assist our customers in learning new IT skills. Many customers use our free training offerings to increase their workforce's overall cloud-based skills. AWS Training and Certification equips learners and organisations in more than 200 countries and territories with education resources to build and validate in-demand cloud computing skills. Learners of various skill levels, roles, and backgrounds can build knowledge and practical skills with 600+ free online courses in up to 14 languages on AWS Skill Builder. Since 2020, we have helped more than 21 million people globally to get free cloud computing skills training,[104] as part of our commitment to provide free training to 29

[103] See https://aws.amazon.com/developer/tools/?nc1=f_dr.

[104] See https://www.aboutamazon.co.uk/news/aws/ai-skills-report.

million people globally by 2025.[105] In the UK, we have provided cloud skills training to more than 1.1 million people since 2017; this includes both free and paid training.[106] We have also committed to provide two million people of all ages with free AI skills training by 2025.[107] We also help cultivate the next generation of cloud professionals through our Education Programs, including AWS Academy, AWS Cloud Institute, AWS Educate, and AWS re/Start, providing cloud skills training and AWS Certification opportunities to individuals of diverse backgrounds who want to learn cloud or seek a career change. We recently launched two paid digital subscriptions for our digital learning centre, "AWS Skill Builder: Individual and Team", to support customer learning with highly interactive, challenged-based learning and AWS Certification exam preparation.

67. While AWS and other cloud services providers make considerable efforts and investments to reduce the inherent technical barriers, it is impossible to remove them completely. Removing all technical barriers, to the extent that it is even feasible to do, would require all services to be equivalent. However, cloud services providers should not be penalised just because they do not offer identical services to their competitors (*e.g.*, Azure does not offer an analogous service for AWS's DNS service Route 53).[108] Requiring all services to be equivalent would remove any incentive to innovate as a new feature or service would need to be shared with and replicated by competitors. Therefore, any requirement to have equivalent services would lead to IT providers offering the lowest common denominator service, thereby harming customers. For example, a customer complained that they face technical barriers since S3 and Azure Blob Storage have different SDKs and APIs.[109] To completely remove these technical barriers caused by feature differentiation between services, either the providers would have to work to a common SDK or API, or one of the providers would have to adopt the other's SDK or API, resulting in a redesign and delayed release of services. Customers would then lose out on the characteristics and features that make a provider's services unique, and providers would no longer have an incentive to innovate.

Remedies seeking to resolve inherent technical barriers would be disproportionate

68. The potential remedies considered in the TB Working Paper are unnecessary for the reasons explained above. In addition, they would severely harm innovation and customer choice. For example, imposing mandatory regulator-enforced standards[110] is simply incompatible with dynamic and innovative industries, such as the IT sector. IT providers large and small are constantly developing new technologies to meet customer needs and solve novel problems, each offering a unique set of services, features, reliability, availability, scalability, and price. User

[105] See https://www.aboutamazon.com/news/workplace/amazon-to-help-29-million-people-around-the-world-grow-their-tech-skills-with-free-cloud-computing-skills-training-by-2025.

[106] See https://erp.today/aws-london-summit-heralds-opportunity-during-times-of-crisis/.

[107] See https://www.aboutamazon.com/news/aws/aws-free-ai-skills-training-courses.

[108] TB Working Paper, paragraph 5.18.

[109] TB Working Paper, paragraph 5.55. Note that this particular issue can be resolved through open-source solutions, such as those offered by Github. See https://github.com/bendrucker/azure-blob-to-s3.

[110] TB Working Paper, paragraph 9.33.

requirements are also constantly changing, and technology needs to be developed and applied in different ways to address new challenges. Technological innovation does not follow a linear path, and experimentation with different solutions is required to discover their benefits and drawbacks. Enforced standards run counter to the dynamic needs of the industry and tether innovation to a static set of technologies and practices. Even if those standards encapsulate the optimal solutions at the time they are set, they will likely not be optimal solutions for future problems.

69. The steep cost of the proposed remedies is unwarranted considering the lack of evidence of competition concerns. Moreover, as explained in paragraph 65 above, customers value different aspects of cloud services and face unique challenges depending on their use case. For example, one customer may value low latency highly whereas another may value availability over latency. Imposing a blanket remedy will not resolve the inherent technical barriers that are specific to each customer and risks limiting customer choice.

70. Finally, if the CMA were to impose remedies for technical barriers on cloud services providers, these remedies should be applied to all IT services providers in order for them to be effective rather than just to some cloud services providers.[111] Given that new entrants are entering the market for the supply of IT services on a regular basis and IT providers are constantly developing new features and services for customers, it is not clear which IT provider will gain customers in the future and therefore it would be unfair to only impose restrictions on some IT services providers but not others.

[111] TB Working Paper, paragraphs 9.7 to 9.9.

Potential Remedies Working Paper

It is unnecessary to consider potential remedies in a well-functioning market where intervention is not warranted

71. The working papers do not present any evidence that there are features in the supply of cloud services that give rise to an AEC, except in relation to Microsoft's licensing practices. Therefore, it is premature to consider potential remedies in the absence of evidence that harm to competition can be expected. Indeed, the consideration of possible remedies is always contingent on an AEC finding having been reached,[112] which is not possible on the evidence presented in the working papers. Notwithstanding this, we make the following observations on certain elements of the potential remedies working paper (the "**Potential Remedies Working Paper**").

72. We would encourage the CMA to take a very cautious approach when considering actions taken by regulatory and legislative authorities in other jurisdictions in its assessment of any potential remedies in this investigation. For example, 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 not enacted in response to demonstrated harm to competition. We welcome the fact that, by contrast, the CMA is taking the time to learn and understand how cloud services work and assess the need for remedies before imposing them, and we are confident it will reach the conclusion that none are required, except in respect of Microsoft's licensing practices. Introducing legislation in a dynamic industry that is functioning well, such as cloud services, risks negatively reducing the long-term incentives of providers to invest and innovate. Indeed, some of the regulatory requirements set out by the EU Data Act may result in an unintended reduction of competition and suboptimal outcomes for consumers as cloud service providers' ability to compete for new customers and to innovate will be constrained. For example:

    a. Any regulatory requirement for cloud services to work with a predetermined set of standards will impede rather than improve competition in the IT sector. Such a requirement would run counter to the dynamic needs of the IT sector, reduce incentives to innovate and increase the cost of any innovation. Even if certain technologies may have become *de facto* standards among cloud providers and customers, it is entirely possible and likely that these standards can and will change as technology continues to evolve.

    b. Price controls on DTO fees "at cost" and banning the possibility to earn profit on DTO will act as a disincentive for cloud services providers using proprietary networks to innovate and invest to improve their service, and will lead to higher prices for other services as providers will need to recoup these costs elsewhere.

73. We therefore strongly urge the CMA against considering an approach similar to that of the EU Data Act. Moreover, the Potential Remedies Working Paper considers that the similarity of

[112] CMA3, Market Studies and Market Investigations: Supplemental guidance on the CMA's approach, January 2014 (revised July 2017), paragraph 3.10.

measures taken in other jurisdictions may be relevant to the CMA's proportionality assessment of potential remedies should it find an AEC, *i.e.*, that it may be "*relatively less costly to make similar changes in the UK*."[113] Considering the extra implementation costs is not the right basis to assess whether a proposed remedy is proportionate to the alleged issue it is trying to address, particularly where such measures are without adequate justification in their own jurisdiction, let alone in the UK. For example, if there is no compelling evidence that customers are unable to switch or multi-cloud due to technical barriers in a way that harms competition, a remedy mandating standardisation or functional equivalence of cloud services will never be proportionate or warranted simply because the additional cost of implementing it outside of the EU (*i.e.,* in the UK) is minimal.

74. We observe that the Potential Remedies Working Paper contemplates tools that may be available for intervention via the Digital Markets, Competition and Consumers Act 2024 (the "**DMCC Act**").[114] Reasons similar to this market investigation – lack of evidence of an AEC and the existence of a well-functioning market – render unwarranted an intervention under the DMCC Act. Hypothetically, if competitive conditions radically change in the future, the DMCC Act will always give the CMA the necessary tools to assess adverse effects on competition and intervene if warranted.

[113] Potential Remedies Working Paper, paragraph 3.8.

[114] Potential Remedies Working Paper, paragraph 3.23.

Conclusion

75. The IT services market is well-functioning, dynamic, and competitive. Within this market, cloud services continue to increase competition, innovation, and choice, while lowering costs and technical barriers to switching and interoperability. Focusing only on one part of the overall IT services market does not appropriately capture the sector's inherent competitive dynamics and fails to recognise the ways that cloud services have lowered costs and technical barriers and spurred innovation that has benefited UK businesses. It displays all the beneficial aspects of competition and produces considerable value for customers. It is evident from the working papers and empirical evidence that competition is functioning well in relation to cloud services, and this is supported by the features this sector exhibits, also taking into account the key factors set out in the Guidelines for market investigations.[115] In particular, firms are incentivised to compete to meet the needs of new and existing customers by innovating to provide better services at lower prices and increase the number, variety, and quality of new and existing services and features. They are naturally rewarded for satisfying customers with more sales. The dynamic nature of this market is further evidenced, and driven, by the entry and expansion of new and existing cloud services providers.[116] The only reasonable interpretation of the evidence presented in the working papers is that this is precisely the type of market where intense rivalry between firms to win customers' business is delivering good outcomes for customers, thus requiring no regulatory intervention. Since proudly pioneering the development of cloud services only 18 years ago, we have had to compete fiercely to remain successful by constantly innovating and delivering high quality services at competitive prices, and these competitive dynamics continue to characterise the well-functioning IT services market we see today.

76. We appreciate that the CMA is taking the time better to assess the market and we remain confident that, based on the irrefutable evidence before it, the CMA will reach the conclusion that no form of intervention is warranted, other than with respect to Microsoft's licensing restrictions. In fact, any other intervention would be disproportionate and detrimental for customers.

77. For all of the reasons set out above, we call for the CMA to carefully consider the evidence provided in this submission which challenge its emerging views in order to avoid unnecessary intervention in what is already a well-functioning, dynamic, and competitive IT services market.

[115] CC3 (Revised), Guidelines for market investigations: Their role, procedures, assessment and remedies, paragraphs 10 to 12.

[116] See *e.g.*, paragraph 24 above.