

Comments on CMA's working paper on technical barriers

IBM welcomes the opportunity to comment on the CMA's preliminary views in relation to technical barriers and commends the CMA's extensive work to date. As previously set out in its comments on the Issues Statement, IBM believes that the cloud industry faces various technical barriers that limit interoperability and portability. In addition to certain general comments, IBM will set out here some preliminary views on (i) areas raised by the CMA for discussion, and (ii) the remedies considered by the CMA. [§<]

General comments

Diversity of cloud use. IBM notes that the CMA's investigation so far has yielded diverse viewpoints from customers. This is only to be expected, since customers will have markedly different experiences with cloud depending on their levels of expertise, their industry and their use cases. [§<]

Switching vs. multi-clouding. IBM supports the CMA's overall preliminary conclusion, in its working paper on technical barriers ("**Technical Barriers WP**"), that customers experience technical challenges relating to (i) switching between public clouds¹ and (ii) multi-clouding.² IBM agrees that these two scenarios are by their nature markedly different and should be assessed separately:

- For switching, portability is key [§<]. Portability ensures that customers can consistently use the best service for their needs, efficiently manage their spending and, more broadly, embrace cloud in a more predictable way, irrespective of where it is hosted. [§<]
- Multi-clouding is a very complex area and warrants a nuanced approach.
 - What is multi-clouding? In its Technical Barriers WP, the CMA looked into various levels of integration. IBM invites the CMA to address these differing scenarios with the necessary caution. [§<]
 - Multi-clouding is also key for resiliency. [§<]

Focus on artificial technical barriers. As the CMA acknowledges, certain technical barriers may be inherent in cloud. As a matter of priority, IBM invites the CMA to focus its efforts on artificial barriers that increase the technical challenges customers face when switching between and/or integrating multiple clouds. IBM considers the following areas to be key:

- Maintaining – and improving – the publication of open and stable APIs.
- Preserving optionality, integration, and interoperability of third-party ancillary services. Ancillary services are essential tools for mobility in the market. However, a third-party supplier of ancillary services is dependent on the relevant CSP for access [§<].
- [§<]
- [§<]

Public cloud does not operate in a vacuum. Alongside the focus on public cloud, IBM invites the CMA to be vigilant regarding interlinkage between public cloud, private cloud and on-premises infrastructure.

¹ Technical Barriers WP, para. 1.8.

² *Ibid.*, para. 1.6.

IBM notes the importance of assessing possible remedies from a broader hybrid cloud standpoint, so as to avoid unintended consequences. [REDACTED].

Possible remedies. The provision of cloud infrastructure services is a complex market, and the assessment of possible remedies to technical barriers warrants a cautious and nuanced approach. While IBM understands that the CMA is assessing competitive dynamics throughout the entire cloud stack, it should ensure that the differences in the way services are provided at the various levels are fully taken into account. IBM notes that the CMA has already identified differences between the market dynamics for IaaS and PaaS services, and these should be kept front of mind if and when deciding on possible remedies. IBM reiterates that there is no one-size-fits-all in terms of remedies for interoperability/portability, and this would need to be assessed for each level of the cloud stack, for each type of service and take into account that older services may be harder to retrofit to comply with new requirements, especially for smaller providers.

IBM summarises below its preliminary views on possible remedies for technical barriers:

- Open and stable APIs. [REDACTED]
- Increased transparency and better customer information could go a long way to improving market conditions in the short term, especially with regards to the publication of open API/SDKs (or the continuation thereof). Requiring all CSPs to describe e.g., how customers can migrate away from their cloud may however not be efficient (customers need automation and tools more than information to migrate) and risks imposing a disproportionate burden on smaller providers.
- Standardisation may also warrant a nuanced approach. [REDACTED]
- [REDACTED].

Additional calls for inputs

- ***Ways in which technical barriers may influence future competition, including price, quality, innovation and customer choice***

The CMA noted the diverging views among CSPs on whether increased interoperability and portability risk hindering innovation and customer choice.³ IBM considers that interoperability and portability would foster innovation and increase customer choice. Lowering technical barriers would further push CSPs to compete on the merits of their offerings. An increase in interoperability and portability is not equivalent to a harmonisation of services offered by CSPs. On the contrary, improved interoperability and portability would allow customers to choose the services that best meet their needs, without having to factor in the costs relating to switching. [REDACTED]

- ***Technical costs for core services***

The CMA looked into three potential sources of costs connected to technical switching and/or multi-cloud costs: (i) feature differentiation, (ii) interface differentiation and (iii) asymmetry of integration.⁴ While IBM agrees that differences in features of core services may generate some technical costs, IBM views these costs as inherent to a competitive market and no more than a function of the differentiation between suppliers on the merits. [REDACTED]

[REDACTED]. As previously explained, IBM considers that when a provider exclusively provides (or significantly favours) cloud-related services within its own cloud infrastructure, this may affect competition [REDACTED]. While a measure of asymmetry of integration may in some cases be technically necessary, IBM considers that in most cases reserving integration to first-party services creates artificial technical barriers. [REDACTED]

³ *Ibid.*, paras. 4.31 et seq.

⁴ *Ibid.*, paras. 5.2 et seq.

As set out above, while IBM agrees with the CMA's observations on the different levels of portability for IaaS and PaaS core services, [REDACTED].

- **Technical costs for ancillary services and tools**

IBM welcomes the CMA's focus on ancillary services and tools. As previously explained to Ofcom and the CMA, IBM considers that interoperability of Day2 operations tools is a critical area, as well as interoperability of tools allowing for cloud costs monitoring. IBM has invested into many cloud-agnostic ancillary tools (e.g. Apptio, Turbonomic, IBM Verify, OpenShift, etc.). The continued cooperation of CSPs is essential for ancillary tools to effectively facilitate switching and multi-cloud. [REDACTED]

- **Latency**

IBM agrees with the CMA's conclusion that latency can be a challenge - for specific customers - to integrating multiple public clouds, when the integration involves workloads that require real-time or near-real-time transfers of data.⁵ [REDACTED].

- **Mitigation of technical costs**

a) *To which extent can and do CSPs design public cloud infrastructure services in a way which makes it easy to switch to but hard to switch away from at a technical level;*

[REDACTED].

b) *To which extent other CSPs, ISVs and customers can unilaterally mitigate technical costs to multi-cloud and switching, without the active co-operation of the incumbent cloud providers;*

IBM agrees that tools are available to mitigate, to a certain extent, technical costs [REDACTED].

c) *To which extent open-source communities are able to incentivise cloud providers to facilitate multi-cloud and switching, for example because these communities develop more open competing products, or because customers and/or cloud providers' employees share their values and are able to influence cloud providers.*

IBM is and has always been a strong supporter of open source. Open source is good for the competitiveness of the cloud market irrespective of whether the services are implemented by the customer or managed. [REDACTED]

[REDACTED].

Remedies

- **General design considerations**

- Scope: The CMA is assessing the scope of cloud services and CSPs that should be covered by possible remedies. As set out above, there are differences in the way services are provided at the various levels of the cloud stack, and remedies should be tailored to the specific issues they are aiming to address. As such, IBM considers that it is unlikely that remedies relating to *all* cloud infrastructure services would be appropriate in this case, and that remedies should be developed at the very least for *each specific* type of services where an issue has been identified. [REDACTED]

With regards to the scope of remedies, IBM considers that this would need to be assessed on a remedy-by-remedy basis. [REDACTED].

⁵ *Ibid.*, para. 7.19.

IBM also invites the CMA to consider that while its investigation focuses on the UK market, cloud services are often provided on a worldwide basis. CSPs already need to comply with diverging regulatory requirements throughout the world [§].

- Duration: Considering the fast-moving nature of this market, IBM considers that it is impossible to estimate the minimum duration of possible remedies to effectively address potential competition concerns. IBM considers that any remedies that may be imposed by the CMA should in principle be [§] subject to review provisions allowing for modification or withdrawal depending on changes in market conditions.

- **Standardisation remedies**

As explained in its comments on the CMA's Issues Statement, IBM is in favour of open and widely used industry standards. However, the devil is in the detail and IBM would need to understand what the CMA aims to address, and what would be the requirements of any standardisation remedies, in order to be able to provide more helpful comments on these issues. IBM nevertheless sets out below preliminary views on some of the CMA's consultations questions.

IBM notes that standardisation warrants a nuanced approach. [§].

IBM also notes that the section on standards refers to the adoption of common practices, e.g., requiring CSPs to publish some or all of their APIs.⁶ It is unclear to IBM how this would differ from the suggestion of principle-based requirements set out in the following section.

- a) *9.46 Do you agree with our characterisation of common standards in cloud services and interfaces, as set out in Table 9.1 and, if not, why do you disagree?*

IBM broadly agreed with the characterisation of common standards set out in Table 9.1 [§].

- b) *9.47 Do you agree that common standards and standardisation in general are more appropriate for IaaS, ancillary services and tools and interfaces (APIs) than for more abstracted types of PaaS services?*

As previously explained, [§].

- c) *9.50 Which standards setting bodies have sufficient independence and could set common standards for one or more of the types of cloud service or interfaces?*

IBM considers that the best way to ensure appropriate governance for standards would be to rely on the Linux Foundation. [§].

- d) *9.51 Should the standards apply to all cloud providers that offer a relevant cloud service or should standards only apply to the largest cloud providers?*

As set out above, limiting a standardisation remedy to the largest providers may have unintended effects and be detrimental for other CSPs. [§].

- **Principle-based requirements**

- a) *9.62 Is it preferable to impose broader principles-based requirements on cloud providers, or more prescriptive rules/common standards?*

IBM considers that the response will depend on the concerns the CMA aims to remedy. IBM agrees with the CMA that monitoring of compliance with any principle-based requirement would be key for the efficiency of such remedy.

⁶ *Ibid.*, para. 9.33.

b) 9.63 What broad principles should cloud providers be required to comply with, if we pursued a principles-based approach?

As explained above, there is no one size-fits-all remedy for the various issues that the CMA is assessing. [REDACTED].

c) 9.64 Should all cloud providers be required to comply with a principles-based approach or only the largest cloud providers?

This will also need to be assessed on a case-by-case basis. [REDACTED].

[REDACTED].

- **Use of abstraction layers**

The CMA is considering whether it would be necessary to require CSPs to provide abstraction layers, possibly for free.⁷ IBM does not consider that there is a need for such a remedy [REDACTED].

- **Interconnectivity and latency remedies**

The CMA is considering whether remedies relating to (i) connecting third party data centres and/or (ii) requiring CSPs to make data centre space available to other CSPs would be appropriate.⁸ IBM considers that such a remedy is neither warranted nor efficient. [REDACTED].

Separately, IBM notes that [REDACTED].

- **Transparency remedy**

As explained to the CMA throughout the investigation, IBM supports efforts to improve customers' information as to the interoperability of cloud services, so as to allow them to make better informed choices. IBM however agrees with the CMA that if too much information is published, this would ultimately have a negative effect on customers. IBM also notes that requiring all CSPs to describe e.g. how compatible their cloud is or how customers can migrate away from their cloud⁹ may not be efficient (customers need automation and tools more than information to migrate) and risks imposing a disproportionate burden on smaller providers.

[REDACTED].

⁷ *Ibid.*, para. 9.71 et seq.

⁸ *Ibid.*, paras. 9.95 et seq. and 9.105 et seq.

⁹ *Ibid.*, para. 9.116.