Call for inputs:
Cloud Services Market Study

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Vodafone response
November 2022

Ofcom's review of the Cloud market is welcomed
Vodafone welcomes Ofcom's Cloud Market Study. It is clear that the cloud market is evolving rapidly and has now become an essential supporting element to a range of other industries and markets, including the UK communication sector. Large hyperscalers dominate the cloud market and Ofcom must be mindful of the potential for market failure to exist in the future, and in particular vigilant on restrictions which prevent consumers of cloud services from exercising choice.   These include restrictions that render consumers of cloud unable or unwilling to switch cloud providers due to either commercial or technological barriers dictated by either the market structure or by suppliers themselves - either because they hold a dominant position within the market as a whole, or because of their incumbent status as the supplier to individual cloud consumers. Ofcom are therefore right to seek to understand the market today and take decisive action to promote the market to develop in a positive way, protecting consumers from harm.

Cloud infrastructure has the potential to reduce the cost base for data hosting and the speed at which an organisation can increase or decrease data capacity and implement new infrastructure, platform or software capabilities. The cost benefit of the hyperscalers' pay as you go and pay as you use charging models may sometimes reduce cost wastage of installations permanently configured for peak demand and loss in quality of service when peak expectations are breached. These benefits are seen in the ongoing transition of many corporates to cloud service providers, although an ongoing question remains regarding cost, security, resiliency, and redundancy planning in relation to migration of the most sensitive, critical and regulated workloads.

Fostering a positive market evolution is part of Ofcom's role
Cloud by its nature is a disruptive technology and the market for cloud services, while still in its adolescence, is dominated by large hyperscalers who are seeking to leverage their respective positions in other technology markets and ecosystems to radically reimagine the infrastructure, hosting and software sectors. The telco sector has played a role in the provision of more traditional forms of storage/processing/hosting. The fixed telco sector is in the process of losing substantial revenues in this transition, putting further pressure on a sector with low market returns. It is yet to be seen if these revenues can be replaced by cloud resale and consultancy services and the potential cost saving of utilising cloud internally. The transition to cloud also affects the connectivity market as network operators (mobile and fixed) incorporate cloud design principles, however as yet the full benefits of cloud are yet to be realised due to factors that encourage the use of private cloud over public cloud. Ofcom is well placed and correct to "investigate whether any feature of the market, or the behaviour of providers, could dampen competition between suppliers and therefore have an adverse effect on business customers through higher prices, lower quality products or less innovation".

Connectivity services are vital to our modern society. Cloud has an important role to play with respect to fixed and mobile operators' costs and transformation in the speed to market of new services, increasing the welfare of UK consumers. Cloud could be one of the important tools to improve mobile profitability and in turn assure the investment in vital mobile networks. Ofcom has a role in ensuring a **well-functioning Cloud market**, as part of the communications value chain. The policy framework should:
- Support the growth of the UK tech industry and the scaling of 5G by enabling an open market for cloud service provision

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- Support regulation which maintains free flow of data across approved jurisdictions and does not limit telecommunications providers ability to choose their vendor of choice for service quality
- Support investment into 5G, edge services, network slicing and the connectivity services of the future by giving cloud providers & networks the certainty to invest together on new innovative solutions
- Evenly apply regulatory obligations / costs to create a level playfield, particularly with regard to security obligations
- Progress the move from self-regulatory codes around data portability towards enforceable remedies that ensure that portability remains a credible reality for cloud architectures

Cloud products are typically sold as homogenised offerings, standardised across all segments of users in a non-bespoke, take it or leave it manner. It is this standardisation that drives down the cost of provision and the improves scalability of the offering. Ultimately however it comes at a price, as cost effective vanilla cloud offerings (without market change) diminish the scope for innovation, requiring greater sophistication and service centric service wrap.

Regulators could have a role in ensuring that cloud users are not limited in their **ability to innovate**. Cost and interoperability barriers lead Cloud users to trade convenience and cost reduction off against curating their ideal network / service design.
- There are cost barriers of transporting data held in one cloud to be processed in services associated with another cloud. The import of data has no charge whereas exporting of data is charged for creating a barrier to multi-cloud use and full choice of applications.
- The potential to mitigate data exporting charges (explained above) by hosting the chosen / preferred software application within a single cloud is hindered by a lack of willingness by 3rd party software supplier to certify the software operation in another cloud domain.

Regulators could have a role in ensuring **appropriate quality of service levels are offered**. There is scope for greater cost efficiency in cloud design. Hyperscalers' could increase the level of service level agreements and service level guarantees for their services which in turn could enable less consumption and simplified design by service users.

Regulators could have a role in **assuring end to end network security** in particular where cloud is used by CNI customers. The integration of cloud as part of a CNI telco service requires a specialised approach with both parties being subject to legislative requirements.

Answers to questions:
Question 2.1: How do you see developments in the international context impacting the provision of cloud services in the UK?
- Geopolitical factors impact purchasing decisions and the level of available competitive choices.

Question 4.1: Do you agree with the scope of the market study?
- We consider understanding private cloud use by telcos for network functions is necessary.

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Question 4.2: Are there other ways to those listed in paragraphs 4.11 to 4.14 in which customers use cloud services, and factors which determine their cloud usage, that we should examine?
- We consider that barriers to innovation / customer choice should be examined. For example the reduction in choice due to the financial practise to apply egress data transfer costs and the lack of 3rd party certification when an application is hosted in a competitors cloud environment.

Question 4.3: Do you agree that the features set out in paragraph 4.15 are the most important features for customers when choosing cloud services?
> We propose considering the following**:**
- Cost
- Functionality, convenience
- Security and resiliency
- Geopolitical concerns
- Location of data centres (eg larger centres tend to have capacity and services added prior to smaller subsidiary locations which improves speed and QoS)
- Data sovereignty, ability to control their own data and maximise the value of their own data

Question 4.4: Is our characterisation of how cloud services are sold and buying patterns correct at paragraphs 4.16 to 4.18? Are there other methods?
- We consider there is merit in considering the extend of standardisation of services. The lack of sector specific solutions / terms and conditions has implications for CNI telcos utilising Cloud.

Question 4.5: Do you agree with our characterisation of competition for different types of services and customers? Are there any other aspects where competition may vary?
- A purchasers' competency with Cloud design and use determines which type of Cloud provider can be purchased from and deployed effectively.

Question 4.6: What are your views on our characterisation of cloud ecosystems?
- As the ecosystem expands the bundling of features can impact competition across the market.

Question 4.7: Do you agree with our proposed approach for considering the dynamics in cloud infrastructure services competition, and what do you think are the most important issues to examine?
- Ability to innovate and move workloads between cloud services via use of managed hosting and multi-cloud solutions
- Inefficient costs placed on users of Cloud that could be resolved via greater interoperability or certification, barriers to switching such as lack of portability standards and egress fees
- Geopolitical factors that reduce choice (unjustified data localisation mandates)

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Question 4.8: Do you agree we should examine cloud ecosystem competition? How do you see cloud ecosystems currently developing, including around core areas set out in paragraphs 4.40 and 4.45?
- Hyperscalers are at different stages with their roadmaps for products. It is our view that where there is a "competency leader" initially they are caught up over time by the other Hyperscalers.
- We consider the market should be supported by:
- Switching / migration tools'
- The ability for customers to choose multi cloud to enable preferred software solutions,
- The ability to purchase unbundled services,
- Consideration as to whether bundling limited competition.

Question 4.9: Do you have any concerns regarding any conduct or activities of any provider(s) that may adversely affect market dynamics now or in the future?
- The integration of cloud as part of a CNI telco service requires a specialised approach with both parties being subject to legislative requirements.
- Barriers to effective switching choices due to the limited number of hyperscalers in the event of geopolitical concerns.

Question 4.10: Are there any remedies that you believe we should investigate further to mitigate some of the potential risks we've identified in this document or concerns you have with the market?
The policy framework should:
- Support the growth of the UK tech industry and the scaling of 5G by enabling an open market for cloud service provision
- Support regulation which maintains free flow of data across approved jurisdictions and does not limit telecommunications providers ability to choose their vendor of choice for service quality
- Support investment into 5G, edge services, network slicing and the connectivity services of the future by giving cloud providers & networks the certainty to invest together on new innovative solutions
- Evenly apply regulatory obligations / costs to create a level playfield, particularly with regard to security obligations
- Move from self-regulatory codes around data portability towards enforceable remedies that ensure that portability remains a credible reality for cloud architectures
- Remove cost and interoperability barriers lead Cloud users to trade convenience and cost reduction off against curating their ideal network / service design.
- Respond to the integration of cloud as part of a CNI telco service requires a specialised approach with both parties being subject to legislative requirements.
- Promote increased level of service agreements and service level guarantees for their services, which in turn could enable less consumption and simplified design by service users.