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WORKSHOP ON SWITCHING AND INTEROPERABILITY OF DATA PROCESSING SERVICES

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Executive Summary

On the 28 April 2023, BEREC organized a Workshop on Switching and Interoperability of Data Processing Services. The event took place taking into consideration the proposal for a Regulation on harmonised rules on fair access to and use of data (the Data Act) put forward the European Commission on the 23 February 2022. The Data Act includes several provisions to facilitate switching and interoperability of data processing services and indicates that independent national competent authorities with experience in electronic communications services are well placed to ensure the application and enforcement of specific provisions. This exchange followed up on a previous BEREC General Statement on the draft Data Act[1] and a High-Level Opinion on the European Commission's proposal for a Data Act[2].

The workshop allowed sharing different views and perspectives from legislators, academia, users and the industry with the aims to i) gain a deeper understanding of the barriers to switching and interoperability faced by data processing services users; ii) identify solutions to reduce those barriers or possible lock-in effects taking into consideration their impact on security, data protection or innovation; iii) exchange on how the experience of switching of telecommunication services can be helpful for the elaboration and implementation of the Data Act and iv) foster a constructive dialogue with stakeholders and legislations for the finalization and implementation of the Data Act provisions.

The main topics and takeaways from the workshop are summarized as follows:

- **Cloud services landscape**

Most participants generally shared concerns about high concentration and limited competition in the cloud services markets and welcomed the Data Act objective to facilitate users' choice and eliminate the barriers and practices that may lead to their lock-in. Most speakers shared their expectations that the Data Act may help fostering healthy competition based on innovation and pricing. With this aim, the EC underlined the three general features that switching should fulfill to achieve a competitive cloud market: i) free of charge; ii) fast and iii) fluid.

- **Interrelation between cloud and Electronic Communications Networks and Services (ECN/S)**

Most participants underlined the interlink between cloud and Electronic Communications Networks and Services (ECN/S). The representative of the EC signalled the strong link between edge computing and electronic communication networks and services (ECN/S).

[1] https://www.berec.europa.eu/en/news-publications/news-and-newsletters/berec-welcomes-the-draft-data-act-proposed-by-the-european-commission

[2] https://www.berec.europa.eu/system/files/2022-07/BoR%20%2822%29%20118_BEREC%20H-L%20Opinion%20on%20the%20ECs%20proposal%20for%20a%20Data%20Act_0.pdf

Also with regard to the interplay between ECN/S and cloud, the Open Gateway was presented. This is a joint initiative involving telecommunications providers across the world to develop network-as-a-service capabilities cooperating with *hyperscalers* and developers through global and standardised APIs.

Mr. Grassia, representing ETNO, highlighted the transformation role of the cloud for ECN/S. As cloudification of networks is progressing and network-as-a-service is enabled, functions and components of the network are shifting towards the cloud. Such developments imply that telco operators will follow the implementation of the Data Act also as cloud services users.

Several speakers indicated parallelisms between telecommunications regulation and the Data Act provisions regarding switching and interoperability of data processing services. However, it was also pointed that that data processing services entails added complexity compared to ECN/S due to the heterogeneity of the services and bundling and integration of services with IT systems.

- **Technical considerations: functional equivalence and interoperability**

The EC explained that the Data Act will require functional equivalence for providers of Infrastructure as a Service (IaaS), for the same service type and for the services/infrastructure under the control of the original IaaS provider. Providers of Platform and Software as a Service (PaaS, SaaS) would be required to make open interfaces available and to ensure the compatibility of these interfaces with standards or open interoperability specifications.

In this regard, some speakers signalled some difficulties of enforcing these Data Act provisions. Namely, the following challenges were mentioned: i) the classification of the services (i.e., how to determine that services are the same); ii) the complexity of cloud services and its implications for switching or the adoption of mullti-cloud solutions (e.g., customer acquiring cloud services at different levels or integrated with the systems); iii) the specification for minimum scope of exportable data; iv) the delineation of responsibilities in the switching process (that could vary depending on the type of service provided and may to be shared among the original provider, the user and the recipient); v) the impact on innovation of the standards and interoperability provisions and vi) the potential adverse effects on smaller providers (being the Data Act symmetric regulation).

To minimize these risks, Mr. Schnurr proposed a “hypothetical service replication test”. WIK and AWS pointed out to standards solutions and tools setup by cloud providers to facilitate switching but also suggested a more targeted intervention defined on a case-by-case basis. OVH Cloud underlined the importance of open formats usable by all stakeholders to achieve operability and portability of data. Finally, ETNO indicated the need to further clarify responsibilities in the case of resellers.

- **Financial (charges and costs) considerations**

The EC explained that the Data Act proposal foresees the full removal of switching charges three years after the Regulation's entry into force. During the three-year transition period, providers are allowed to charge reduced switching charges reflecting the costs incurred.

The views on this matter were split in three different positions: i) OVH Cloud and Beltug welcomed this measure. Beltug pointed out that the providers should evaluate the cost of switching at an aggregate level, as in the telecommunications or energy sectors. OVH Cloud highlighted the high costs of migrating data out of a cloud provider's network and egress fees should be abolished immediately, without waiting the three years stated in the Data Act; ii) On the other hand, AWS representative considered that switching charges are too broadly defined in the Data Act thus preventing the provider to charge for any data transfer-out at all and recoup costs.. Additionally, he suggested distinguishing between data transfers and switching as providers should not be obliged to pay for external resources that they do not control or influence. iii) ETNO called for the proportionality of egress costs. However, ETNO considers that some kind of remuneration for the cost of the transfer is required as migration processes can be complex and may require support of specialised companies that has to be remunerated. A similar intermediated approach was expressed by Mr. Schnurr. He sustained that provisions should safeguard against inflated financial barriers to switching but allow for recoupment of regular costs.

- **Contractual considerations**

The EC explained that the Data Act includes a maximum notice and a maximum transition period during which the switching process must be concluded, with exceptions in cases of proven technical unfeasibility.

Mr. Schnurr shared the view that contractual obligations should be targeting to the switching process. In this regard, rules specifying a maximum transition period for the switching process itself are considered more justified than the proposed right of customers to terminate any contractual agreement with a data processing service provider within a maximum notice period of 30 days as users may also benefit from long term contracts.

Beltug's representative called for more widespread use of exit clauses in contractual agreements. He noted that reference standard contractual clauses in the EU Cloud Rulebook proposes a standard clause for switching and exit assistance. This implied that a switching and exit plan has to be included from the beginning in the cloud agreement. Furthermore, the provider must provide the tools to export customer data and applications.

- **Regulatory consistency**

The EC signalled that cloud computing is touched by various regulatory regimes like cybersecurity and data protection. This entails significant challenges for coherent enforcement. For this reason, the Data Act proposal introduces a mechanism for cooperation on effective enforcement, not only across borders but also across regulatory disciplines.

Mr. Schnurr mentioned the relevance of guaranteeing consistency between the symmetric regulation in the Data Act and complementary instruments such as sector-specific regulation and the Digital Markets Act or competition law.

WIK further considered that the Data Act provisions on switching and interoperability go well beyond the requirements of the Digital Markets Act. WIK considers that the requirements and obligations which apply to gatekeepers or players with market power (i.e., asymmetric regulation) should be more detailed and perhaps more onerous than the Data Act.

- **Governance**

The proposal calls on Member States to designate competent authorities to enforce the Data Act. In this regard, the EC signaled that ECN/S regulators bring valuable experience in this context, especially in switching, and the growing interrelation between cloud and ECN/S. From a broader perspective, the EC acknowledged that evolution of ECN/S requires regulators to move more strongly into the digital space. The Data Act proposal lays the basis for a comprehensive enforcement regime with opportunities for BEREC members to play an important role.

Mr. Schnurr underlined the fact that regulatory intervention requires a deep understanding of the economic characteristics and competition dynamics of data processing industry that could differ for each service. He also stated that BEREC should play a very important role in the enforcement of the Data Act.

1. Introduction

On the 23 February 2022, the European Commission published a proposal for a Regulation on harmonised rules on fair access to and use of data (the Data Act)[3]. The proposal includes several provisions to facilitate switching between providers of data processing services, measures to foster interoperability of the services. It indicates that independent national competent authorities with experience in electronic communications services are well placed to ensure the application and enforcement of specific provisions.

As part of the work related to BEREC's input to the EU institutions on the Data Act, in BEREC's Work Programme 2023[4], a workshop on data processing services switching and interoperability was envisaged with the aims to (i) gain a deeper understanding of the barriers to switching and interoperability faced by data processing services users; (ii) identify solutions to reduce those barriers or possible lock-in effects, taking into consideration their impact on security, data protection or innovation; (iii) exchange on how the experience of switching of telecommunication services can be helpful for the elaboration and implementation of the Data Act and (iv) foster a constructive dialogue with stakeholders and legislations for the finalization and implementation of the Data Act provisions.

The workshop followed up on previous BEREC workflows on the draft Data Act in 2022: a BEREC general statement on the draft Data Act[5] and a High-Level Opinion on the European Commission's proposal for a Data Act[6].

The event took place on the 28 April 2023 and was structured in the following parts:

1. Opening by BEREC's Chair 2023, Mr. Konstantinos Masselos,
2. Keynote speech by the EC speaker, Ms. Laura Balke (DG CNECT), introducing the Data Act provisions,
3. Brief presentations of different reports/projects providing different perspectives on the topic,
4. Industry panel,
5. Closing words by BEREC's Vice-president 2023, Ms. Annemarie Sipkes.

[3] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2022:68:FIN
[4] https://www.berec.europa.eu/en/document-categories/berec/berec-strategies-and-work-programmes/berec-work-programme-2023
[5] https://www.berec.europa.eu/en/news-publications/news-and-newsletters/berec-welcomes-the-draft-data-act-proposed-by-the-european-commission
[6] https://www.berec.europa.eu/system/files/2022-07/BoR%20%2822%29%20118_BEREC%20H-L%20Opinion%20on%20the%20ECs%20proposal%20for%20a%20Data%20Act_0.pdf

The debate involved all relevant stakeholders and reflected their different viewpoints: academics, consultants, cloud providers and cloud business users, telecommunications providers. It relied on presentations by the panellists as well as on Q&A sessions.

As part of the preparatory work for the workshop, a context paper[7] (see Annex I) was provided to further define the scope of the workshop and support the speaker's interventions.

About 100 participants, representing BEREC members and different types of stakeholders, took part in the event. All the presentations shared during the event has been published in BEREC's website[8] and the full video of the event is available on BEREC's YouTube channel[9].

2. Keynote speakers

2.1. Mr. Konstantinos Masselos, BEREC Chair 2023

Mr. Masselos, was not able to deliver his opening speech due to technical problems, however, even outside the workshop's limited timeframe, he has often expressed BEREC's great interest in the proposed legislation of Data Act, which is likely to play a key role in the digital transformation. The provisions set out in the context of Data Act clarify who can access data and in what terms. This proposal was timely introduced by the EC. Data has become one of the most valuable assets in our society and most of the innovative technological developments of our times (like AI, IoT and cloud) are closely related to the production and use of data. It is undeniable that whoever is in control of the generated data, has power and advantage. This may result in distortion of the competition in the data market and limitations to the rights of the users.

BEREC is following with great interest the process of the trilogue, both because of Data Act's expected impact on the data market, businesses, consumers, public services and society as a whole, but also because BEREC has a lot of experience in issues that are closely related to the provisions of this proposal, like switching, interoperability and pricing regulation.

As technology evolves, more and more the line between the electronic communications sector and the digital ecosystem becomes blurry, due to the growing role played by digital services in traditional markets. The European digital policy framework is adapting to this ever-changing environment and BEREC is taking action to play its part in this evolution.

[7] https://www.berec.europa.eu/system/files/2023-04/Workshop%20context%20paper.pdf
[8] https://www.berec.europa.eu/en/events/berec-events-2023/berec-workshop-on-switching-and-interoperability-of-data-processing-services
[9] https://youtu.be/n-wuj5KI-qw

BEREC has published an action plan[10] which shows how BEREC and the NRAs will get prepared to contribute to a regulatory environment in Europe 2030, fit for the digital age and the global context. In 2022, BEREC published a general statement on the draft Data Act and a High-Level Opinion on the European Commission's proposal for a Data Act. In this document, BEREC shares some best practices and suggestions gained by its experience in applying similar provisions in the telecommunications sector as it is the case of switching. Also, in its 2023 work program, several work items have been included related to cloud services, among those, following closely the developments around the Data Act.

This workshop is of great interest to BEREC, as it aimed to gain a deeper understanding of the barriers to switching faced by data processing services users, to identify solutions to reduce those barriers and the possible lock-in effects and to consider how the experience of switching of telecommunication services can be helpful for the elaboration and implementation of the Data Act.

2.2. Ms. Laura Balke, European Commission (DG CNECT)

Ms. Laura Balke has represented the European Commission (EC) who provided the rational and general lines of the Data Act to facilitate switching and interoperability of data processing services, covering both cloud and edge services. The EC underlined three main features that switching should fulfil to achieve a competitive cloud market. It should be: i) free of charge; ii) fast and iii) fluid.

Regarding switching cost, the EC explained that the Data Act proposal foresees the full removal of switching charges, covering egress fees[11] and other costs (e.g., use of API), three years after the Regulation's entry into force. During the three-year transition period, providers are allowed to charge reduced switching charges reflecting the costs incurred. The proposal foresees monitoring of this reduction by the EC.

Additionally, the EC noted that switching must be made swift for the user. To this end, the proposal includes a maximum notice and a maximum transition period during which the switching process must be concluded, with exceptions in cases of proven technical unfeasibility. During the three years until the full abolition of switching charges, the interoperability provisions of the Data Act will significantly facilitate switching.

Ms. Balke signalled the importance of interoperability, a matter closely related to BEREC's expertise, to facilitate a fluid switching. Although interoperability is at the heart of the Data Act proposal, it is not overly prescriptive on how interoperability of data processing services shall be achieved. The proposal obliges providers across the cloud stack to remove obstacles to switching. Functional equivalence would be only required for providers of Infrastructure as a

[10] https://www.berec.europa.eu/en/document-categories/berec/berec-press-releases/press-release-berec-defines-its-vision-for-the-regulatory-environment-by-2030

[11] Egress fees are charges for moving, retrieve, or transferring data from the cloud.

Service (IaaS), for the same service type and the obligation is limited to the services/infrastructure under the control of the original IaaS provider. Providers of Platform and Software as a Service (PaaS, SaaS) are required to make open interfaces available and to ensure the compatibility of these interfaces with standards or open interoperability specifications identified in the new Union repository for interoperability of data processing services. , Both harmonised standards and open interoperability specifications, building on the work done by the industry in this field, can be identified in the repository. The EC considers that past experiences with traditional standardization for the cloud market have not resulted in significant market uptake. Open interoperability specifications are therefore introduced in the Data Act as a parallel route for the implementation of the switching provisions.

The EC trust that these measures will allow fluid switching and, in the absence of lock-in practices, providers will compete on innovation and pricing.

The proposal calls on Member States to designate competent authorities to enforce the Data Act. The EC mentioned that electronic communication regulators bring valuable experience in this context, especially in switching, considering particularly the strong link between edge computing and electronic communication networks and services (ECN/S). Moreover, the evolution of electronic communication requires regulators to stretch their action out to the digital space and the data Act may be a first instance of that. Cloud computing is touched by various regulatory regimes like cybersecurity and data protection. This entails significant challenges for coherent enforcement. For this reason, the Data Act proposal introduces a mechanism for cooperation on effective enforcement, not only across borders, but also across regulatory disciplines. The Data Act proposal lays the basis for a comprehensive enforcement regime with opportunities for BEREC members to play an important role.

3. Switching and interoperability perspectives

3.1. Mr. Daniel Schnurr. CERRE and University of Regensburg

Mr Daniel Schnurr, author of the chapter "*Switching and interoperability between data processing services in the proposed Data Act*"[12] as part of the CERRE Report "*Data Act: towards a balanced EU data regulation*" (2023) intervention focused on the main following topics.

The speaker pointed out that the Data Act is a horizontal and symmetric regulation, which sets basic rules for all providers of data processing services, irrespective of their size and market positioning. This approach implies a different regulatory burden for providers having a different scale and calls for an assessment of potential adverse side effects.

[12] https://cerre.eu/publications/switching-and-interoperability-between-data-processing-services-in-the-proposed-data-act/

The Data Act's focus is enabling one-off switching between data processing services, complemented by interoperability rules and standards as well competition and sectorial regulation. However, this main objective sets in a quite complex context where the Data Act establishes mandatory contractual safeguards, provisions for data portability, the principle of functional equivalence and the concept of interoperability regulation.

In general, contractual obligations should be targeted to the switching process. Thus, rules specifying a maximum transition period for the switching process itself are considered more justified than the proposed right of customers to terminate any contractual agreement with a data processing service provider within a maximum notice period of 30 days. Moreover, provisions should safeguard against inflated financial barriers to switching, but allow for recoupment of "regular costs" and all involved parties should account for their own responsibilities in the switching process.

More in detail, regarding required provisions for data portability, art. 24. 1 (b) mandates specification for minimum scope of exportable data (which include metadata created during the use of the service), art. 26.4 provides for a structured, commonly used, non-proprietary and machine-readable format and for the principle of functional equivalence. The latter poses some questions, for instance if the portable data proves sufficient to recreate the same service at the original provider. In this case, the principle for functional equivalence could be substituted with a hypothetical service replication test. This test implies questioning if, in case of taking out portable data from the original services, the same service could be provided if this data would be provided as a new customer. In case test is passed, the data provided would be considered sufficient and with the required quality for the performance of the service. In the opinion of Mr. Schnurr, this change would minimize the need for a general classification of service type for all data processing services and would free up originating service providers from responsibilities linked to the functional level offered by the recipient. This is suggested to foster clarity about the responsibilities of the involved operators and reduce legal uncertainty for both the original service provider and the destination service provider.

Concerning interoperability, mandatory interoperability standards will have to be assessed against possible adverse effects on smaller providers. Benefits of interoperability may accrue to big companies for economies of scale/scope. In addition, technical complexity, broad diversity of services and dynamic technological progress should be considered when mandating interoperability standards.

Finally, yet importantly, it was noted by Mr. Schnurr that some action to guarantee consistency between the symmetric regulation in the Data Act and complementary instruments such as sector-specific regulation and the Digital Markets Act (obligations on data portability) would be necessary to address potential competition issues. Such intervention requires a deep understanding of the economic characteristics and competition dynamics of data processing industry that could differ for each service. BEREC should play a very important role in the enforcement of the Data Act.

3.2. Mr. Claude Rapoport, – Chairman of Beltug

Beltug represents the users of digital technologies and networks' association in Belgium. Europe launched competition in the telecom market for removing lock-in problems. In the cloud services markets however, lock-in problems are much bigger nowadays. Beltug worked with sister organisations from France, Germany and the Netherlands, and detected many unfair and unbalanced clauses in cloud contracts, that raised problems for conducting business on the demand side. Therefore, Beltug elaborated 11 principles[13] to get a balanced and fairer cloud market.

One of the principles is that cloud service providers should fulfil existing regulatory obligations, following evidence (for instance with the implementation of the GDPR) that big cloud providers are not prone to compliance.

Other principle is that cloud service providers should not create a commercial or technical lock-in: each provider proposes its own specific technical environment, so to raise costs for redevelopment. Against this obstacle, interoperability could prove an effective solution. In addition, licence management and migration costs cause lock-in as tie-in factors. Nowadays, less than 5% agreements include switching and exit clauses, so when entering a contract, businesses do not know if they can get back their data and applications, neither they know the costs of exit and getting back their intangible data and data related assets. Art. 23, removing obstacles to effective switching, and 25 in the proposed Data Act on gradual withdrawal of switching charges are therefore very timely and necessary. Based on the proposed Data Act, cloud contracts should include switching and exit clauses.

Regarding the costs of switching, according to the first legislative version, Beltug pointed out that the provider should evaluate the cost of switching at an aggregate level, as in the telecommunications or energy sectors. Nonetheless, the European Parliament introduced a change, which could bring back risks of lock-in, as it foresees charges for services undertaken at customer request, so that only mandatory operations must not be charged. On the other hand, the EC has appointed an expert group to write down standard contractual clauses (SCC) compliant with the proposed Data Act. The impact of that is uncertain, as it will not be mandatory, due to the fact that the principle of freedom of contract has to be respected. In all cases, the SCC will be included in the Cloud Rulebook[14], so to gain a reference status for virtuous compliance. The EC expert group proposes a standard clause for switching and exit assistance. It requires a switching and exit plan to be included from the beginning in the cloud agreement. It requires also the provider to provide the tools fit to export and transport the customer data and applications. Business users do hope that the switching and exit plan becomes an element of competition in the market, so to be allowed to choose the best cloud provider also on the basis of the best exit conditions.

[13] 11-fair-principles-BELTUG-CIGREF-CIOPLATFORM-VOICE-06102022.pdf
[14] https://digital-strategy.ec.europa.eu/en/library/cloud-and-edge-computing-different-way-using-it-brochure#Rule

Some considerations were done by the speaker on the broader picture that witnesses the explosion of IoT data and the flourishing of partnerships between telco, involved in data transport, and cloud providers (joint/bundled offers) who are indispensable for data storage and processing. This implies an evolving market scenario that tends to promote market concentration on the offer side. Such a set-up requires BEREC intervention. Indeed, BEREC, being familiar with the liberalization and regulation of the telco sector, will have to consider new consolidation processes triggered by the cloud market that does involve telcos as well.

3.3. Ms. Ilsa Godlovitch, Director, Brussels (WIK – Consult)

On behalf of WIK, Ms. Godlovitch presented their recent study *"Interoperability, switchability and portability – Implications for the Cloud"*[15].

WIK underlined lessons from the past on interoperability and portability in the telecommunications - and the banking-sector. The examples in telecoms and banking showed that it took quite a long time to make interoperability and portability work and that non-standardised closed services rapidly overtook the standardised versions. Moreover, the speaker noted that whereas with those services single homing was very common, cloud services have a higher degree of multi-homing.

Porting obligations in banking and telecoms involved only basic information and key processes and required collaboration between recipient and donor. Switching cloud services is not as straightforward as it is for SMS, calls or banking services, because it requires a whole environment to be considered. Cloud switching entails interoperability between IT environments that could include infrastructure, platforms, applications and data, e.g., cloud switching could also involve not only data portability, but also application portability. In the case of Software as a service (SaaS), there are many different kinds of services with higher complexity and different switching efforts.

Ms. Godlovitch indicated that the responsibility for interoperability aspects also varies in the different scenarios and across the value chain. It could lie with the customer (in the case of IaaS), the cloud service provider or the app provider. The amount of data involved differs as well, for example if you stayed for a long term with a provider it could accrue to petabytes. Many different scenarios and alternatives are thinkable when you look at the different services (IaaS, PaaS and SaaS) or even switching between those categories.

Solutions for some of these issues already exist, including standards like REST, Json, xml or APIs making the different applications "fit" together. Even the 2020 SWIPO Code of conduct, which is focused on the most straightforward area of switching, namely switching between IaaS and potentially IaaS and on-premise infrastructure, notes the difficulty to "estimate switching costs" possible "data portability incompatibilities" due to the different technologies,

[15] https://www.wik.org/fileadmin/files/_migrated/news_files/WIK-C_Studie_Implikationen-fuer-die-Cloud.pdf

protocols, implementation methods involved. In comparison, it was much easier in the past to make, for example, SMS interoperable or the porting of a telco identifier possible.

About the implementation of the Data Act, WIK did not expect that the Data Act provisions on switching and interoperability go well beyond the requirements of the Digital Markets Act. However, one would have expected that the requirements and obligations which apply to gatekeepers or players with market power would be more detailed and perhaps more onerous than those that apply to the market as a whole.

Ms. Godlovitch did not consider suitable to speak about interoperability and portability in generic sense but, due to the vast range of services, it is important to look at specific services or data, as with the examples with telcos and banking. In this sense the responsibilities, timeframes and complexity for switching depend on the nature/level of the source and destination cloud service, and the amounts of data involved. Also, the provisions in the Data Act speaking of “Full equivalence” in interoperability and “service continuity” in switching would leave little room for service differentiation and innovation.

Four recommendations from the WIK study for the implementation of the data act:

- **Recommendation 1: Targeted (case specific) intervention rather than general obligations**

  Instead of blanket obligations for cloud interoperability and portability and undefined standards goals, identify specific applications/cases where there is an objective interest based on evidence of demand for a specific form of interoperability and/or portability that is not being met by the market, and the conditions described in Recommendation 2 are met.

- **Recommendation 2: Support for innovation, respect for proportionality**

  When mandating standards, ensure that the relevant use cases are clearly identified, intervention is relevant to the problem identified, and that the measures are proportionate and take into account the implications on innovation and the potential to differentiate. Limit the objective that interoperability should achieve “functional equivalence” to basic functions and/or data (i.e. a subset of mature and established functions or data which have been identified as essential), and further clarify this concept.

- **Recommendation 3: Principles for service migration and shared responsibility**

  Distinguish between standardised and bespoke cloud services. Limit responsibilities for migration for CSPs to those, which are under their control, and require recipient to collaborate in good faith. Consider developing model contract provisions addressing certain common issues.

- **Recommendation 4: Coherence with other legislation**

  Avoid overlapping or adding on other legislative measures. Digital Market Act already enlists cloud as core platform service for gatekeepers’ designation. Data Act should be lighter touch and not extend the Digital Market Act.

3.4. Mr. Óscar Louro García, Go-To-Market Director, (Telefónica Open Gateway)

Mr. Louro on behalf of Telefónica started his presentation by pointing to the major developments of telecommunications network providers. With the arrival of new standards (3G, 4G, 5G) there is a completely new set of capabilities. However, these new capabilities are only available through complex special projects that require a lot of time and resources that are not easily replicable for other customers. With these new generations of networks, it has become easier to transform telco networks to programmable networks that are accessible by third parties by the means of APIs. “Open Gateway”[16] is the initiative that should make this possible. It is led by GSMA; many operators are participating in the initiative that looks to transform telecommunications networks into platforms. “Open Gateway” aims to open up telco capabilities to an interoperable, intuitive and programmable environment. These capabilities are deployed through global and standardised APIs under the framework of “CAMARA”, the Open Source project led by the Linux Foundation in partnership with the GSMA.

“Open Gateway” therefore constitutes a framework of APIs designed to provide universal access to operator networks for developers. It should accelerate the development of innovative and immersive technologies and services. It is very important to GSMA to make it developer-friendly, for example by offering simple service APIs that abstract complex network APIs, where only one integration for all telco’s worldwide is needed and by satisfying data privacy and regulatory requirements.

Already 25 telcos from all around the world are participating and this initiative is expected to change the sector and positively affects other players of the industry. For aggregators, hyperscalers, start-ups, application providers this should lead to a broader and more innovative range of solutions based on new network and telco APIs, available through the marketplaces for developers. This in the end give the users an improved user experience with premium features for video calling, gaming and fintech applications and access to new services.

Telecommunications networks are very capable and are now moving from traditional APIs, such as voice, SMS, data to the “open gateway” APIs, for example features like device status, QoD mobile (latency / jitter), device location, SMS-based authentication (also silently), number verification or sim swap (important for banking and fraud detection). Within GSMA now the standardization process of these and many, more APIs is ongoing.

In conclusion, GSMA’s ambitions with “Open Gateway” is to transform telco networks into future-ready platforms exposing Network and Telco capabilities with the developer in the centre of GSMA’s attention. Therefore, “Open Gateway” should offer standardized, automated, simple, on-demand APIs. The apps and services that are created should take

[16] https://www.gsma.com/newsroom/press-release/gsma-open-gateway/

advantage of advanced network functionalities, in order to provide a better experience to final customers improving customization of network capabilities.

3.5. Questions and answers session Part I

For Mr. Schnurr

What are the main differences and implications, which need to be taken into account when exporting data from IaaS, PaaS and SaaS layers?

Should some clarity be enhanced on the correlation between the type of cloud service producing the data to be exported and the switching requirements?

“I think clusters and more concrete specifications would certainly be helpful. For IaaS a common set of metadata are the configuration parameters of the containers (e.g., for virtual machines, computing units, etc). For SaaS it will be much more specific to the service (e.g., time stamps of messages in office suites). In my opinion, this can also be approached from a reverse perspective: i.e. “What data and metadata are necessary for an as efficient operator to replicate the service”.

For Ms. Godlovitch:

What is the scope, main differences and implications of data exports that are depending on the type of cloud service (IaaS, PaaS or SaaS)? Who are the main clusters of metadata produced by the use of the main different cloud services?

Ms. Godlovitch explained that – when talking about IaaS for example – the data is under the control by the customer, they are effectively renting infrastructure. Everything on top of that is their own. Therefore, there are only certain scenarios, in which the data is specifically the responsibility of the cloud service provider. In her view, there is a need to go one level of complexity down and for the Data Act to become effective, it is necessary to think about very specific issues and very specific problems and address those directly.

To all speakers:

What is the objective scope of functional equivalence?

Mr. Schnurr and Ms. Balke confirmed that “functional equivalence” is intended to apply only to IaaS. Ms. Balke further explained that Article 26 (1) applies to infrastructure as a service with the proactive obligation for functional equivalence, limited to what the service provider of IaaS can control. On the other hand, obligation in Art 23 has a different rationale given that it aims to remove obstacles and to protect the customer potentially attaining functional equivalence in the new environment.

Another question from the audience targeted fixed term contracts.

Ms. Balke explained that there was some confusion about the purpose of the Data Act in regards of fixed term contracts. In her view, the purpose of the Data Act was not to upend this business model, which could have some benefits for both: providers in terms of security and

for customers in terms of potentially educed service fees. She expects this to be a point to be dealt with in the negotiations with the co-legislators.

The third question connects with CERRE's proposal of a "service replicability test" and what it includes.

Mr. Schnurr explained that the benefit of CERRE's proposal was that it would not be necessary to make any assumption about to which service you switch, even if it is planned to go to another service type. The idea was to cut this link between the original and the destination service provider in terms of a regulatory obligation and ensure that the customer can really get everything they need from the original service provider to be able to replicate the service at another service provider. In such a scenario, it would then be the duty of the destination service provider to be as efficient and to develop the capabilities to provide an equivalent service.

4. Industry Panel

The industry panel was formed by Mr. Arnaud David, Director of EU Public Policy at Amazon Web Services (AWS), Ms. Solange Viegas Dos Reis, Chief Legal Officer, (OVH Cloud) and Mr. Paolo Grassia, Director of Public Policy, (ETNO).

To launch the debate, participants were asked to provide a general statement of their key comments regarding switching and interoperability. After these initial statements, a round of reactions took place.

4.1. Mr. Arnaud David, Director of EU Public Policy at Amazon Web Services (AWS)

Mr. David told the audience some insights about the technical and operational aspects of switching between cloud providers. As a general standpoint, AWS supported the customer's ability to choose the service that best fits their needs and mentioned initiatives and tools put in place by AWS to that end.

He postulated three main comments to the Data Act. The first comment was about the operational and technical side. Here it was stated that the switching process is a shared responsibility between the initial provider, the customer and the destination provider. It is also important to take into account the reason why particular customer wants to switch and the complexity of the infrastructure and the services that the customer has built. Overall, Mr. David said it is important that the Data Act reflects this sort of complexity and should improve in a way that would reflect the technical and operational reality.

The second comment of Mr. David was about the switching charges. These are, at least for the moment, probably quite broadly defined. It is important to have in mind that customers can

decide to transfer their data for a lot of variety of reasons. Operate a data transfer either to switch to the provider, but also just to download the data, to make the data available to the customer, to take the data and to transfer the data as a backup. So, this concept of data transfer is quite broad and the Data Act should probably be a bit more precise, because otherwise the risk that AWS sees is that this will just prevent any provider to recoup the costs related to the development, operation, security, and improvement of cloud infrastructures and services, including to facilitate switching operations. For example, AWS supports data transfer by using truck that transport data between location. Other providers do not. If now all these types of services are free of charge, who will invent the next truck? Similarly, it would not be appropriate to extend the Data Act's requirements on switching to the in-parallel use of data processing services. Next to a negative effect on incentives to innovate, there are other concerns. In order to identify in-parallel use of other service providers, a provider would have to access customer content, raising security concerns. Lastly, removing data transfer fees for in-parallel use of CSPs would encourage customers to seek a "solely CSP-supported IT solution" to benefit from the lack of fees.

The third comment was about the wording of "functional equivalence". He basically pointed out that we need to be careful about not oversimplifying the cloud services as saying that all services are equal and provide exactly the same outcome is far from the reality. You have cloud services on the one side, but you don't know how they are used by customers. It could be just to develop a website or very complex CRM solution. So ultimately, this complexity needs to be taken into account.

According to Mr David's opinion, interoperability is an important topic and there are two aspects to enable it: i) development of standard that are consensus-based focusing on technical reality; ii) building services as a means of interoperability with services from any provider, such as for instance, by using solutions based on open-source software and standards like HTTPS, Kubernetes and Parquet; iii) supporting standard protocols in services and iv) by allowing third-parties to use APIs and SDKs, as we do at AWS.

4.2. Ms. Solange Viegas Dos Reis, Chief Legal Officer, (OVH Cloud)

Ms. Viegas Dos Reis from "OVH Cloud" explained the switching on the cloud market from the perspective of a European cloud provider.

The great support was expressed for the Data Act initiative and the EC, which aims to promote a fair and competitive European market for cloud and data services, but she warns also about the presence of commercial, technical and contractual barriers that prevents customers from switching between providers. In that sense, the Data Act is very important for removing all switching barriers and for ensuring a real freedom of choice (between many providers) in benefit to the users, the cloud providers and the consumers.

Currently the European market for cloud services is strongly concentrated between few stakeholders (three cloud providers are concentrating 72% of the market share and the quick

decrease of the European providers share in the last five years). Therefore, there is a necessity to address this situation with the Data Act in order to ensure better competition in the next years and to allow also new multi-cloud approaches for the consumers. In order to meet users' needs, several cloud services may be required.

Regarding the different barriers, there are concerns about the commercial barriers raised by switching fees or egress fees, and the technical barriers in relation with interoperability.

For the first ones, OVH Cloud advocated for the elimination, without exceptions, of egress frees and mentioned the insights in this regard in a Cloud services market study published by Ofcom[17]. Ms. Viegas Dos Reis highlighted the high costs of migrating data out of a cloud provider's network and egress fees should be abolished immediately, without waiting the three years stated in the Data Act.

It was highlighted that currently in the Data Act there is a time frame for the abolition of the egress fees. This period is 3 years starting from the enforcement of the Data Act. Some concerns were expressed about postponing the abolition of egress fees in three years until 2027, due to the market developing very rapidly. There is a huge concentration of the market in some hands and cannot wait 2027. She believes that the Data Act should be more ambitious on it and immediately abolish those fees, because there is no reason at all to maintain those fees for three years and this is something that is important. It is an expected change from the legislators on the Data Act to turn the abolition immediate and not only in three years.

For the interoperability, Ms. Viegas Dos Reis considered that the Data Act is going in the right direction. However, it could go further and aim to the definition of open formats usable by all the stakeholders to ensure that the data stored by cloud providers could be compatible with such open formats, in order to achieve a good operability and a good portability of the data.

4.3. Mr. Paolo Grassia, Director of Public Policy, (ETNO)

ETNO recently published a study on the Data Act[18], which describes the various business areas of ETNO members affected by it, in their capacity as providers of connectivity, but also possibly as providers of data processing services or cloud services.

Some telecom operators are important cloud providers in Europe, other than the three main hyperscalers. However, the disparity is significant: a large player like Deutsche Telecom, for example, has 2% of the market versus, over 70% combined for the three major ones. There is an ambition to compete. However, there are some barriers: one is the different network effects that of course ISPs cannot leverage; additionally, there are also lock-in effects and then technical barriers to migration. Therefore, ETNO members welcome the Data Act when it comes to switching and interoperability, as a way to obtain a level playing field between

[17] https://www.ofcom.org.uk/consultations-and-statements/category-2/cloud-services-market-study
[18] https://etno.eu//downloads/reports/etno_data-act_report.pdf

cloud providers. ETNO shared some suggestions to improve the Data Act and its pro-competitive objectives towards more proportionality in the implementation:

- ETNO suggested clarifying the responsibility, in the switching process, for companies that are resellers of cloud services. Indeed, telecom providers are often providing services by using cloud resources and infrastructure from other providers.
  ETNO defended that the responsibility for the switching process should rest on the original provider of the cloud resources (i.e., the partner of reseller), because resellers may be limited in their access to the resources, the controls and the functions of the service.
- ETNO's second suggestion concerned the proportionality of egress costs; there should be some kind of remuneration for the cost of the transfer, because some migration processes can be complex (e.g, 5G private networks), specialised companies are sometimes required to help especially small cloud providers into managing the cloud switching and transfer. There should be a space for remunerating these specialised companies.

Finally, ETNO is strictly against exceptions in the implementation of the Data Act, as there have been legislative proposals to carve out specific use cases. The Data Act should apply across borders and technologies.

Mr. Grassia highlighted the transformative role of the cloud, notably for ISPs as cloudification of networks is progressing and network-as-a-service becomes a possibility (e.g., Open Gateway). Functions and components of the network are shifting towards the cloud (e.g., firewall, data workload, balances). This brings new issues, as ISPs are concerned also as users in the implementation of the Data Act. Important network functions are hosted in the cloud, ISPs have to be able to avoid lock-in effects, and also, they will vary of keeping a balanced relationship with the cloud providers they partner with, as the cloud providers become increasingly evolved into telecom networks.

Mr. Grassia also advocated for proportionality in the switching requirements, for example by leaving flexibility in the switching timeline, as business users (like ISPs) sometimes do have a complex cloud environment that needs longer switching times.

4.4. Questions and answers session Part II

What are your views on the provisions in Data Act regarding notice for contracts?

Mr. Arnaud David. AWS

"Some switching operation can be straightforward. Others are probably more complex, depending on the amount of data, on how the solution has been designed by the customer, the different tools used. There should be rooms for contractual negotiation on this. This is because you cannot switch all type of workloads, just within a very short period. It is feasible for some solutions and for others it is not.

By analogy, it is not substantially different from traditional outsourcing where there was an extensive period of transition between two providers. This logic remains the same regardless the technology. So, contractual flexibility remains important in this topic."

Ms. Solange Viegas Dos Reis. OVHcloud

With 5% of the contract contains provision about exit and the complexity moving to cloud is important (moving out of the cloud, moving from cloud to cloud, etc.). Therefore, we are talking about long and complex projects every time."

Cloud switching is a very complex and burdensome process at an early stage. The formulation of contractual clauses should factor in this inherent operational complexity, far from becoming an additional barrier.

Mr. Claude Rapoport. Beltug

He expressed that the exit clause is discussed upfront in the contract. Therefore, when you start the contract, you know the way it could be possible to get out. If there are some egress fee remaining, at least it should be clear from the day one and he expects that all providers give an exit clause plan in the commercial phase in the marketing phase so that this can be used to compare to different offers.

Ms. Solange Viegas Dos Reis. OVH Cloud

She claims for transparent and reasonable fees with an at cost approach. In addition, when moving to a cloud provider, this cloud provider must have in mind that one day clients can move out of service so the price of the cloud service must be already included in the fees paid for the cloud services and the egress fees could disappear."

Mr. Claude Rapoport. Beltug

"Not every customer has to pay for his own getting out because we will only have for example 3, 4 or 5 customers leaving. Users will not be leaving services without reasonable purpose they will switch to other providers. This needs to be addressed at an aggregated level. After aggregation is done, and fees will be calculated like global costs and those fees can be taken into consideration when leaving the services and switching."

4.5. Closing words – Ms. Annemarie Sipkes, BEREC Vice-Chair 2023

Ms. Annemarie thanked all the speakers and participants in the workshop and expressed gratitude to the European Commission and Ms. Laura Balke for a very clear presentation. "All of us now realised the importance of free, fast and fluid switching. Daniel & Ilsa from academic research side pointed out various difficulties and complexities". However, we should not think it is easy to get to a point of having free, fast and fluid switching. Switching is one thing; interoperability is something different. The analogy of switching in telecommunication might prove very useful, but this does not mean that we can apply lessons from the telco experience

weighty (without adaptation and flexibility). Thanks to Claude and Oscar for presenting industry perspectives. Telecom regulators witness the complexity of interaction between telecommunications and cloud providers. There is an interdependence, because “without connectivity a data centre is just a large refrigerator”. Telcos are actors but also clients, as virtualisation is progressing; this is a good reason for BEREC to analyse these developments.

We have heard all the different perspectives from academia, market participants and policy makers. BEREC supports a perspective of technological neutrality, innovation incentives, openness and sustainability. However, although the strategic orientation to a free fast and fluid switching is clear, getting there still confronts us with many technical dilemmas and questions. Looking forward to build on this debate.

5. Conclusions and next steps

BEREC noted and welcomed the lively discussion and active involvement of all participants.

BEREC will continue exchanges an analysis on this topic to deepen on the different points raised by the speakers and in view of the final Data Act legal eventually approved by the EU legislators.

Moreover, the BEREC 2023 Work Programme envisages several work streams related to the provision of data processing services:

- Report on cloud services and edge computing.
- External study on the trends and policy/regulatory challenges of cloudification, virtualisation and *softwarisation* in telecommunications.
- Report on the entry of large content and application providers into the markets for electronic communications networks and services.
- BEREC workshop on the perspectives and regulatory/competition challenges of Internet of Things (where the interlink between IoT, cloud/ edge services and the data economy could be addressed)

The outputs of the workshop will support BEREC’s assessment carried out in these workstreams that could also identify concrete future BEREC’s related work.

Annex I – Workshop Agenda

Keynote speakers

10:00 – 10:05	Introductory words Mr. Konstantinos Masselos. BEREC Chair 2023
10:05 – 10:20	Data Act approaches to facilitate switching and interoperability. Ms. Laura Balke. European Commission

Part I - Switching and interoperability perspectives.

Moderator: Mr. Bert Klaassens. BEREC's Planning & Future Trends working group co-chair

10:20 – 10:30	Academic - Mr. Daniel Schnurr. CERRE and University of Regensburg
10:30 – 10:40	Users - Mr. Claude Rapoport. Beltug
10:40 – 10:50	Consultancy - Ms. Ilsa Godlovitch. WIK
10:50 – 11:00	Telecommunications providers – Mr. Oscar Louro Garcia, Telefónica
11:00 – 11:15	Q&A Part I
11:15 – 11:30	*Break*

Part II – Industry panel

Moderator: Ms. María Ruiz. BEREC's Planning & Future Trends working group co-chair

11:30 – 12:00	Mr. Arnaud David. AWS Ms. Solange Viegas Dos Reis. OVHcloud Mr. Paolo Grassia. ETNO
12:00 – 12:15	Q&A Part II
12:15 – 12:20	Closing words Ms. Annemarie Sipkes. BEREC Vice chair 2023

Annex II - Context paper: Switching and interoperability of data processing services

In February 2022, the European Commission published a proposal for a Regulation on harmonised rules on fair access to and use of data (the Data Act)[19]. The proposal includes several provisions to facilitate switching between providers of data processing services and indicates that independent national competent authorities with experience in electronic communications services are well placed to ensure the application and enforcement of specific provisions.

1. Why is switching and interoperability of data processing services relevant?

Data processing services comprise cloud, edge and other similar services which allow users ubiquitous, flexible, on demand access over the internet to a pool of configurable computing resources, including servers, databases, software applications, storage capacity and computing power. Edge services are a type of cloud services where the location of the data-processing capacity is located close to or in the physical endpoint where the data is generated allowing to offer low- latency distributed computing and storage capabilities as well as other advantages such as control on data location.

Political objectives

According to Eurostat, 41% of EU enterprises used cloud services in 2021 and adoption of these services has increased in the last years. Nevertheless, the EU is still far from the ambition set by the **2030 Digital Compass**. Namely, that by 2030 75% of European enterprises have taken up cloud computing services, big data and Artificial Intelligence and 10 000 climate-neutral highly secure edge nodes are deployed in the Union, distributed in a way that guarantees access to data services with low latency (i.e., a few milliseconds) wherever businesses are located.

Market concentration

The cloud services market is highly concentrated and several studies[20] have identified potential competition concerns including, among others, (technical and financial) switching and interoperability barriers. A recent publication by the Synergy Research Group (2022) states that three leading global cloud providers (Amazon, Microsoft and Google, known as “hyperscalers”) account for 72% of the European market and their share continues to steadily rise. The European leaders, SAP and Deutsche Telekom account each for 2% of the European market. They are followed by OVHcloud, Telecom Italia, Orange and a long list of national and regional players.[21] The highest growth, triggered by PaaS with database, IoT and analytics services, confirm that bundle with data and analytics boosts competitiveness.

[19] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2022:68:FIN
[20] See, for instance, ACM Market Study Cloud services https://www.acm.nl/system/files/documents/market-study-def-public.pdf
[21] Synergy 2022 https://www.srgresearch.com/articles/european-cloud-providers-continue-to-grow-but-still-lose-market-share

2. What is the interplay between cloud and electronic communications services?

Commissioner Breton recently described the future connectivity network as a blend of transmission, storage and computing and signalled the transformation of telecommunication networks into platforms, where connectivity and computing capacity converge (notably with edge computing) and where physical network interconnections become application programming interfaces. This transformation is a consequence of three main developments: i) virtualization trends that entail an increasing relevance of cloud services for the provision of ECN/S (i.e., the provision of certain network elements by cloud providers); ii) the provision of cloud/edge services by traditional ECS/N providers and iii) the joint commercialization of cloud and ECS by means of bundled products raising in particular the need of ensuring the coherent implementation of telecommunication and data processing switching regulation.

3. Why a BEREC workshop?

In 2022, BEREC published a general statement on the draft Data Act and a High-Level Opinion on the European Commission's proposal for a Data Act. In this document, BEREC shares some best practices and suggestions gained by its experience in applying similar provisions in the telecommunications sector as it is the case of switching. In its 2023 work program, BEREC has considered the increasing relevance of data processing services in the provision of ECN/S and, in general, for the Internet Ecosystem. Several working lines related to cloud services have been included in the work programme, among those, following closely the developments around the Data Act.

The workshop aims, among others, to the following objectives:

- Foster a **constructive dialogue** with stakeholders (including providers and users), competent authorities and legislators for the implementation of the Data Act provisions.
- Discuss on **competition of data processing services** including the potential impact of the data processing competition issues in the provision of ECS/ECN. Identify the requirements to enhance competition in the provision of data processing services
- Gain a deeper understanding of the **barriers to switching** faced by data processing services users. Identify solutions to reduce those barriers and the possible lock-in effects taking into consideration their impact on security, data protection or innovation. Consider how the experience of switching of telecommunication services can be helpful for the elaboration and implementation of the Data Act,
- Exchange on how to promote the **adoption** of data processing services to meet the EU 2030 targets.
- Discussing **implementation** issues (e.g., definition of the scope of exportable data).