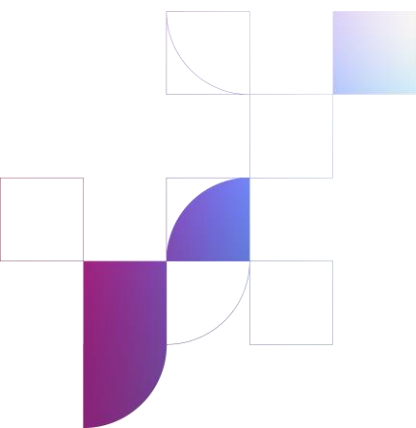


BEREC Report on the outcome of the Public consultation on the BEREC Report on the Internet Ecosystem



December, 2022

Contents

1. INTRODUCTION	2
2. GENERAL VIEW ON FEEDBACK RECEIVED	3
3. COMMENTS ON CHAPTERS 2 AND 3 – OVERVIEW OF THE INTERNET ECOSYSTEM & THE DIFFERENT ELEMENTS	5
4. COMMENTS ON CHAPTER 4 – RELEVANT LEGAL PROVISIONS	6
5. COMMENTS ON CHAPTER 5 – MAIN ACTORS OF THE INTERNET ECOSYSTEM	7
6. COMMENTS ON CHAPTER 6 – ANALYSIS OF COMPETITION DYNAMICS	9
6.1 Enabling and discovery layer elements (section 6.2.1 of the Draft Report)	9
6.2 Devices (section 6.2.2 of the Draft Report)	10
6.3 IAS (section 6.2.3 of the Draft Report)	11
6.4 DNS (section 6.2.4 of the Draft Report)	13
6.5 IP Interconnection (section 6.2.5 of the Draft Report)	14
6.6 CDNs (section 6.2.6 of the Draft Report)	16
6.7 IaaS, PaaS and SaaS (sections 6.2.6 and 6.2.8.3 of the Draft Report).....	17
6.8 Attention intensive applications (section 6.2.7 of the Draft Report).....	18
6.9 Other applications (section 6.2.8.1 of the Draft Report)	19
6.9.1 Live streaming and VoD content providers	19
6.9.2 NI-ICS (6.2.8.2)	20
6.10 IoT (section 6.2.9 of the Draft Report).....	21
7. COMMENTS ON CHAPTER 7 – ANALYSIS OF OPENNESS	22
7.1 Enabling and discovery layer elements (section 7.2.1 of the Draft Report)	22
7.2 Devices (section 7.2.2 of the Draft Report)	23
7.3 IAS (section 7.2.3 of the Draft Report)	24
7.4 DNS (section 7.2.4 of the Draft Report)	26
7.5 IP interconnection (section 7.2.5 of the Draft Report)	26
7.6 Hosting, CDN and cloud computing (IaaS and PaaS) (section 7.2.6 of the Draft Report)	28
8. COMMENTS ON CHAPTER 8 – FUTURE WORK	28



1. INTRODUCTION

This report summarises the responses provided by the stakeholders during BEREC's public consultation on the Draft BEREC Report on the Internet Ecosystem¹ (hereafter "the Draft Report"), as well as BEREC's views on the issues raised by the respondents. The Draft report was opened to public consultation from 14 June to 22 July 2022.

Seventeen respondents contributed to the public consultation, namely:

1. Internet Society
2. Internet Corporation for Assigned Names and Numbers (ICANN)
3. European Telecommunications Networks Association (ETNO)
4. European Competitive Telecommunication Association (ecta)
5. The GSM Association (GSMA) Europe
6. MVNO Europe
7. Telefonica - Spain
8. Vodafone Group
9. The Computer & Communications Industry Association (CCIA Europe)
10. European Broadcasting Union (EBU)
11. Google
12. Meta Platforms
13. Microsoft Corporation
14. Netflix
15. Zapaat Internet Search Engine
16. IP.rec
17. Chris Marsden

¹ BoR (22) 87, Draft BEREC Report on the Internet Ecosystem, 09.06.2022.
<https://www.berec.europa.eu/en/document-categories/berec/public-consultations/draft-berec-report-on-the-internet-ecosystem>

Comments, observations and recommendations raised by the respondents are summarised and structured in different chapters, and BEREC's views are presented in separate boxes. All non-confidential contributions are publicly available and accessible on BEREC webpage.² This report is a summary and it does not explicitly elaborate on comments or observations that are not directly related to the Draft Report subject to public consultation.

The Report on the outcome of the public consultation is organised following the sections of the Draft Report, with exception of the Chapter 2, which provides a short summary of the contributions of the aspects addressed by the stakeholders in their responses. The details of the positions expressed by the stakeholders in relation to the Draft Report are summarised in the Chapters 3-8.

BEREC acknowledges that a large number of respondents shared their analysis and insights on the current discussion concerning the Internet service providers' (ISPs) demand for a contribution by content and application providers (CAPs) to their investment in electronic communication networks (ECN), while a number of CAPs share also their insights with the contrary views. BEREC will not address these points in the current report and refers to its work on the subject.³

This Report on the outcome of the public consultation complements the final BEREC Report on the Internet Ecosystem.⁴ Both reports are being published simultaneously.

2. GENERAL VIEW ON FEEDBACK RECEIVED

The **Internet Society** provides comments on concentration in the content delivery networks (CDNs) market, considerations about Internet openness, diversity and complexity of the internet ecosystem, and provides references to relevant documents prepared by this organisation on topics addressed by the report, including a model to assess policy and regulatory interventions on the Internet.

ICANN's response deals with Domain Name System (DNSs), providing comments on different parts of the report regarding this element.

The contribution from **IP.Rec** reviews many of the topics addressed in the report, highlighting their conclusions on them, raising also issues on the Digital Markets Act (DMA) and Digital Services Act (DSA) and noting the role of EU regulation for other countries outside the EU.

² <https://berec.europa.eu/en/document-categories/berec/public-consultations>

³ See for instance BoR (22) 137, BEREC preliminary assessment of the underlying assumptions of payments from large CAPs to ISPs, 07.10.2022, <https://www.berec.europa.eu/en/document-categories/berec/opinions/berec-preliminary-assessment-of-the-underlying-assumptions-of-payments-from-large-caps-to-isps>

⁴ BoR (22) 167, <https://www.berec.europa.eu/en/document-categories/berec/reports/berec-report-on-the-internet-ecosystem>.

ETNO presents its views on IP interconnection, potential competition issues on DNSs, equipment used by ISPs, switching barriers for internet access services (IAS) and make some proposals for future BEREC work on these areas.

ECTA provides input about the Data Act, on cloud services, calls for a more in-depth analysis of ECS/ECN markets and its competition dynamics, and shares its views on the debate on IP interconnection as well as on future BEREC work.

The response from the **GSMA** focuses on different topics such as DNS, IP interconnection, openness, number-independent interpersonal communication services (NI-ICS), equipment deployed by IAS providers in the end-user premises, bundling and the CDN markets.

The contribution from **MVNO Europe** addresses mainly the issues related to the impact of devices, Operating Systems (OSs) and potential limitations for competition and openness derived from restrictions by devices/OS providers, raising also potential issues on the use of permanent roaming for Machine-to-machine (M2M) services.

Telefonica addresses topics as IP interconnection and the relation between IAs and CAPs, concentration and architectural aspects for DNS and Video on Demand, expressing also its views on the Open Internet (OI) regulation and its future evolution.

The **Vodafone Group** expresses its views on IP interconnection and specifically, on potential market failures and payment among the different actors.

CCIA Europe focuses its response on IP interconnection issues with a wider view on the relation between CAPs and ISPs as well as on openness issues.

EBU stresses the relevance of interoperability, open internet and open standards, calling BEREC's attention on the recent report on CDNs published by this organisation, also providing proposals for further BEREC work on content.⁵

Meta provides information about their investments in digital infrastructure and how Meta considers that it should be treated in relation to the infrastructure of ECN providers. Moreover, Meta also contributed with regards to IP interconnection, competition from other actors faced by Meta, and also raised issues on being compared to other Big Tech companies.

Google provides information about the company's investment in the internet infrastructure and partnerships with telecommunication operators, and shares its views on IP interconnection, specifically on the impact on smaller CAPs, bargaining power among actors and network neutrality issues.

⁵ EBU, CDN Architectures demystified, 2022, <https://tech.ebu.ch/docs/techreports/tr068.pdf>

Microsoft focuses its contribution on the heterogeneity of business models not necessarily based on monetization of data, IP interconnection, and its relationship with ISPs. Microsoft does not seek to compete with ECS/ECN operators but rather partner with them.

The answer by **Netflix** focuses on topics such as IP interconnection, openness and CDNs.

Zapaat's contribution develops a proposal for a standardized Internet ecosystem between the EU and Australia to increase reliability and prevent cybersecurity issues.

Finally, **Chris Marsden** recommends the reading of a book authored by him to address issues that are considered by him as not correct in the report.

BEREC's response:

BEREC thanks all stakeholders having responded this public consultation for their valuable input on the broad topic of the Internet Ecosystem. Input received allowed BEREC to have a more complete view on the different aspects addressed in the report. Many of the responses included reflections on issues not directly addressed in the report that will be taken into account by BEREC in other current BEREC reports or as future work.

BEREC would also like to thank the stakeholders for the useful references provided to reports prepared by stakeholders responding that will be taken into account in future work.

The next sections present in detail the specific feedback received on the topics addressed in the BEREC report open to public consultation, as well as BEREC views on the comments and issues raised.

3. COMMENTS ON CHAPTERS 2 AND 3 – OVERVIEW OF THE INTERNET ECOSYSTEM & THE DIFFERENT ELEMENTS

Regarding the elements in the DNS, **ICANN** believes that end users have always been able to configure their DNS stub resolvers to point to the DNS resolver of their choice, overriding the default configuration. According to **ICANN**, this was happening long before DNS-over-TLS (DoT) and DNS-over-HTTPS (DoH) existed. Regarding BEREC's statement about the domain names stored in authoritative DNS servers, managed at the top level by the international organization ICANN, ICANN comments that this view is not sufficiently detailed for such a complex ecosystem.

Microsoft agrees with BEREC's recognition that "*the internet is composed of many interrelated elements that affect each other*" and commented that the modern internet is more than just the traditional last-mile telco/ISP network infrastructure and one must look at the entirety of the internet infrastructure. Microsoft considers that it would be more appropriate to



also consider cloud computing and CDN as an integral part of the backbone of the internet infrastructure contributing beyond the storage and processing aspects.

BEREC's response:

BEREC agrees with **ICANN** that users have always been able to configure which DNS resolver to use. However, the point in the quote on page 16 of the Draft Report is that in the case of DoH, the choice of DNS resolver may instead be configured by default by the provider of the web browser (even though the user may change the configuration afterwards). Based on this, BEREC considers that there is no need to adapt the corresponding text in the report.

BEREC agrees with ICANN that parts of the overall DNS ecosystem are not covered in detail by the BEREC Draft Report. The operation part of the DNS service is closely related to the operation of IAS, and therefore this is emphasized in the report. However, the registration part of the DNS service, which has its own internal ecosystem, is more peripheral to the ecosystem model in the BEREC report.

On **Microsoft's** comments regarding the position of CDNs and cloud computing in the ecosystem, BEREC observes that these elements do not directly convey traffic between client and server sides, being this the reason why these elements are not in the part of the Internet infrastructure. However, BEREC agrees that these elements are key to distribution of content over the internet. To better illustrate this, BEREC's ecosystem model in the report is enhanced with connections from these elements towards IP interconnect and IAS elements. Thereby, the position of CDNs and cloud computing as being connected to the transmission elements when supporting the application server elements, has been clarified.

4. COMMENTS ON CHAPTER 4 – RELEVANT LEGAL PROVISIONS

On legal provisions, **ECTA** welcomes the Draft Data Act proposed by the EC which is being discussed at the co-legislation stage at the moment of preparation of this report.

In relation to the cloud services markets, **ECTA** agrees where BEREC underlines that BERECs contribution to the Draft Data Act can be valuable. ECTA believes that policy actions can significantly facilitate switching, interoperability and data portability in cloud markets, just like facilitating IAS switching and number portability have been key in the traditional markets for ECSs.

BEREC's response:

BEREC shares **ECTA's** views on the relevance of the draft Data Act provisions for the electronic communication future developments, in particular, the data processing switching

obligations. BEREC is following closely the legislators' proposals and has expressed its availability to provide input to the EU institutions as advisory body on telecommunications related matters.

BEREC has already published a general statement⁶ on the draft Data Act and a High-Level Opinion⁷ on the European Commission's proposal for a Data Act. In these documents, BEREC has acknowledged that the draft Data Act envisages that the independent national competent authority in charge of the implementation of that switching obligations shall have experience in the field of data and electronic communications services. Therefore, there is a common understanding that experience in the electronic communications services is valuable in this context as well. This experience could be relevant, in particular, for the monitoring of switching charges, technical aspects of switching, interoperability, or complaints handling. Draft BEREC work programme 2023⁸ envisages that BEREC will continue contributing to the Data Act and follow the development of the legislative process. In this context, a preliminary assessment on the implementation of switching between data processing services, activities such as a workshop on data processing services switching could be undertaken. BEREC finds that organizations like ECTA can provide a very valuable perspective and input for this work stream and looks forward to further exchanges and cooperation on this matter.

5. COMMENTS ON CHAPTER 5 – MAIN ACTORS OF THE INTERNET ECOSYSTEM

ECTA considers that the description of ECS providers should be expanded substantially, referring also to the presence of alternative operators, competition, the issues at stake in electronic communications regulation, etc. In addition, ECTA asks BEREC to recognize that alternative operators were instrumental in creating the physical infrastructure making the development of the internet possible in Europe. ECTA believes that no consideration, argument and reflection is put forward by BEREC when it comes to providing a more detailed and insightful analysis on the relationship between ECS providers and the global undertakings operating at client and server layers (Alphabet, Meta, Apple, Amazon, Microsoft and Netflix).

Google provides information about its investments on infrastructure. Google investments include subsea cables, large data centres for storing content as well as peering and content

⁶BoR (22) 54, BEREC's statement on the draft Data Act, 12.05.2022.

https://www.berec.europa.eu/sites/default/files/files/document_register_store/2022/5/BoR_%2822%29_54_BEREC_statement_on_the_draft_Data_Act_clean.pdf

⁷BoR (22) 118, BEREC High-Level Opinion on the European Commission's proposal for a Data Act, 15.07.2022.

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

⁸BoR (22) 143, Draft BEREC Work Programme 2023, 07.10.2022, <https://www.berec.europa.eu/en/document-categories/berec/berec-strategies-and-work-programmes/draft-berec-work-programme-2023>

delivery infrastructure at the edges of the network and beyond where they interconnect with ISPs.

Meta also provides information about its infrastructure. Meta operates 21 data centres around the world. Meta states that they invest across a variety of edge network elements, including PoPs virtually across all Europe, caches and IXPs. Meta's high capacity transport networks and edge network are not deployed in order to supply services to third parties and all of these facilities are used exclusively by Meta to transport data between its data centres and edge network as efficiently as possible. For this reason, Meta considers that its infrastructure deployment acts as a complement and not a competitor to telecommunications service and IAS providers for those services. Meta believes that because it is present in only a relatively small number of elements in the internet ecosystem (in 4 of the 20 elements analysed), it should not be grouped together with other Big Tech companies or labelled as being "*present across practically all of the elements in the internet ecosystem*".

Microsoft proposes to BEREC to improve the description of Microsoft's specific ecosystem in subchapter 5.2 of the Draft Report on the Internet ecosystem.

Netflix believes that in any given country, an average European user can generally choose from less than a handful of ISPs for the provision of broadband Internet service, a reality not well described by the statement that "the electronic communications services market is very fragmented".

BEREC's response:

On the general comment by ECTA about the need for a more in-depth analysis of ECS/ECN markets and its competition dynamics in this report, BEREC refers to all the work it has carried out and is carrying out on the issues proposed by ECTA. Such markets have been and will be extensively treated by BEREC over the years. Given the scope of the current report, BEREC is giving a general high-level view of the different elements of the internet ecosystem which is not claimed to be exhaustive for any of the elements, including those related to ECS/ECN markets.

BEREC has enriched the description of Alphabet based on information provided by **Google** on their CDN and partnerships with ECS operators.

Regarding the comment from **Meta** stating that high-capacity transport networks and edge networks deployed by this actor are focused on self-provisioning and not to supply to third parties, BEREC has adapted the conclusions in chapter 5, making it clear that in many cases the communications infrastructure deployed by platform providers act as a complement and not as competitor for ECS services provided by the traditional telecommunication actors.

BEREC welcomes these accurate and comprehensive input provided by **Meta** concerning the updated figures (i.e. the number of data centres owned by Meta) and complementary information on the elements of the internet ecosystem where Meta is present. BEREC has updated the chapter accordingly.

BEREC agrees on that **Meta** is not in practically in all elements of the Internet Ecosystem. As a matter of fact, BEREC is of the opinion that Meta is significantly present in several key elements, justifying its inclusion in chapter 5. Furthermore, Meta provides widely used services worldwide to a large number of users and has a significant market capitalization. It is moreover already widely recognised among the Big Tech companies. This being said, the text stating that “*Big Tech companies are present across practically all the elements of the Internet Ecosystem*” has been adapted to “*Big Tech companies are present across practically all the elements, or they can enjoy a significant presence in a relevant part of the elements in the internet ecosystem*”, and considers that the assertion that the Big Tech can leverage their position among different services and products holds even if they are not operating in practically all the elements.

On the issues raised by **Microsoft** on the heterogeneity of business models, BEREC agrees that the large variations of business models applied by large providers in the internet ecosystem, and on the fact that data monetisation is not always one of the key pieces for all business models. However, going through the level of granularity needed to analyse each business model applied by each platform would exceed the scope of the report, which is to present a general high-level view. In the context of other reports more focused on specific core platform services, such as NI-ICS, BEREC applies a more granular approach. Still, the final report has been adapted to take account of the differences among business models.

Based on the comment raised by **Netflix**, BEREC has adapted the subsection 5.6 to focus on ECS providers without making direct comparisons with the actors on the client and server sides.

6. COMMENTS ON CHAPTER 6 – ANALYSIS OF COMPETITION DYNAMICS

6.1 Enabling and discovery layer elements (section 6.2.1 of the Draft Report)

Microsoft reports that this company has announced a set of principles⁹ that apply to its app store on Windows, including a commitment to treat apps equally in its store, not requiring developers to use its payment system to process in-app payments, or not requiring developers to provide more favourable terms in this specific app store than in other app stores. These,

⁹ Microsoft, Adapting ahead of regulation: a principled approach to app stores, 2022, <https://blogs.microsoft.com/on-the-issues/2022/02/09/open-app-store-principles-activision-blizzard/>

and other commitments¹⁰, meant that Microsoft does not favour the exclusivity that leads for market closure in the ecosystem.

BEREC's response:

BEREC thanks **Microsoft** for its feedback and notes that Microsoft is not mentioned among the players imposing exclusivity in application stores. However, BEREC has adapted a paragraph in its executive summary and conclusions to stress that competition is impacted *when/if* independent application developers cannot access integrated application stores.

6.2 Devices (section 6.2.2 of the Draft Report)

MVNO Europe welcomes BERECs observation that devices are tied to other elements, potentially creating barriers to entry for new competitors. MVNO Europe believes that this does not fully address the issue that the so-called “termination monopoly” affects not only OSs, app-stores and search engines but also internet access providers. According to MVNO Europe, without the carrier partner agreements in place, several iOS features are blocked, not working properly or have to be manually configured (e.g. MMS, Mobile Hotspot, VoLTE deployment, 5G access, VoWiFi etc.). For instance, big companies are hard to approach refusing to make steps without commercial deal in place. The smaller the vendors become, the easier to talk to and work with. According to MVNO Europe, this is obstructing open internet and freedom of choice to the detriment of end-users. By buying an iPhone device, users are not only obliged to use the corresponding Apple OS, but they are also constrained/limited in their usage of the features developed for this OS. It is distorting competition on electronic communications markets in favour of the largest network operators that have a ‘carrier partner agreement’ with Apple, resulting in less choice, less competition and & less innovation.

MVNO Europe also believes that challenges with carrier bundles are particularly an issue for those smaller operators who operate under their own MCC/MNC tuple. Operators purely borrowing MNO will experience less problems, although it may still be preferred to have customized setting for the particular subrange used (for example: pre- defined different APN, customized VoLTE settings, etc). Another topic is eSIM support on smartwatches. According to MVNO Europe, both Apple and Samsung limit the deployment of this service via a commercial model and additional requirements (entitlement servers). MVNO Europe considers that it should be up to the operator to agree with its end-customer on a certain commercial offer, it should not be Apple who dictates this to the MVNO.

MVNO Europe suggests that BEREC adds the following wording at the end of paragraph 6.2.2 so to explicitly underline this problem: *“Furthermore, OEMs may also discriminate between one electronic communications provider and another, by guaranteeing the full*

¹⁰Microsoft, Building a new, open Microsoft Store on Windows 11, 2021, <https://blogs.windows.com/windowsexperience/2021/06/24/building-a-new-open-microsoft-store-on-windows-11/>

functionality of the device/OS only to those operators that signed a commercial agreement that binds the operator to provide also additional services. It is for example the case of Apple that makes the proper functioning of its handsets and operating system conditional upon the signature of a 'carrier partner agreement' that requires operators to also sell iPhones and provide technical assistance in for these. Those are services that small and specialized operators do not have the means to provide. Without this type of commercial agreement in place, several features are blocked, not working properly or have to be manually configured (e.g. MMS, Mobile Hotspot, VoLTE deployment, 5G access, VoWiFi, etc.). Other big companies, like Samsung and Google, are also hard to approach and refusing to make steps without a commercial agreement to be in place. This is obstructing the principles of the OI and freedom of choice to the detriment of end-users. It is distorting competition on electronic communications markets in favour of the largest network operators that have a 'carrier partner agreement' with Apple. Overall, this causes less choice, less competition and less innovation".

BEREC's response:

BEREC shares the concerns of MVNO Europe on the impact of "carrier partner agreements" on ISPs, affecting the full functionality of the devices, since the limitation in the devices may impact competition among ISPs. To this regard, BEREC reiterates that the interdependencies that exist among the different elements of the internet ecosystem and, therefore, the potential bottlenecks in one element may impact other elements in terms of competition and/or openness. For this reason, BEREC has been following the topic on potential bottlenecks arising from the devices' mechanisms or ecosystem, having already developed some work¹¹ on it and has also organised internal workshops. Notwithstanding, BEREC notes that these issues are beyond the current regulatory powers of NRAs, which limits their ability to intervene when needed.

In this context, BEREC will take on board in the final version of the report the concerns *related to the absence of commercial agreements* presented by MVNO Europe. In addition, the example provided by MVNO Europe related to eSIM *in smartwatches* will also be *added*.

6.3 IAS (section 6.2.3 of the Draft Report)

ECTA notes that the report does not provide any evidence on the differences between competition dynamics existing in different Member States and on how less than complete implementation of the regulatory framework has promoted or restrained competition. In addition, ECTA believes that today the European ECS, ECN and IAS markets, although the regulatory framework applied in EU Member States, are far from being really competitive at fixed and at mobile segments, with some limited exceptions. ECTA recognizes that mobile

¹¹ BoR (18) 35, BEREC report on the impact of premium content on ECS markets and the effect of devices on the open use of the Internet, 08.03.2018.

https://www.berec.europa.eu/sites/default/files/files/document_register_store/2018/3/BoR_%2818%29_35_BEREC_report_premium_content_ECS_markets.pdf

number portability has decreased the switching costs and had a very positive impact on the competition dynamics, noting the presence of a strong fourth MNO as the crucial factor for having difference on mobile competition dynamics. ECTA also comments on the relevance of non-discrimination obligations.

According to **GSMA** and **ETNO**, the trend towards bundled offers by ISPs is reported as having increased switching barriers, making it more difficult for new market entrants to compete but BEREC fails to mention that this issue, when and if it occurs, has already been addressed by the EECC (section 6.2.3).

According to **Netflix**, BEREC notes that ECS pro-competitive regulation in the last two decades has played a very important role in ensuring market entry, effective competition and innovation for the benefit of users". While some large ISPs have expressed concerns about the investments needed to achieve next generation networks (FTTH) rollout and their profitability, Netflix suggests BEREC should also take note of new entrants¹² investing heavily in fibre networks, for example institutional funds with a long-term capital outlook that seem to contradict those concerns.

BEREC's response:

BEREC highlights in the Draft Report that, in general, the IAS market is mostly dynamic, which does not exclude that there may be different levels of competition across Member States and markets. Notwithstanding, considering **ECTA's** comment on the differences between competition dynamics existing in different Member States, BEREC clarifies in the final version of the report that there are competitive differences related to the specificities of each market (e.g. the number of players).

Regarding **ECTA** comment on the factors that led to the decrease of switching costs in the mobile market, BEREC highlights that number portability is only mentioned as an example of regulatory intervention that had a positive impact in the competition dynamics. Notwithstanding, there are other factors that have also impacted to the decrease of mobile switching costs.

Concerning the **GSMA** and **ETNO** comments on bundled offers by ISPs, BEREC will add in the final version of the report a reference to the provision of the EECC as suggested.

BEREC acknowledges the **Netflix** contribution on the relevance of regulation in order to ensure competition and on the strong investment in networks by new entrants. BEREC recognises that new entrants, such as new types of investors, have played an important role in this regard. Notwithstanding, the investment in FTTH has been mainly done by the telecommunications operators (or partly financed with public funding). BEREC considers that

¹² New types of investors in the FTTH networks (e.g. institutional funds, private equity firms).

this idea is already reflected in the Draft Report and for, that reason, does not see the need to change the text in the final version of the report.

6.4 DNS (section 6.2.4 of the Draft Report)

From the **ICANN** perspective, one must distinguish between two main areas of the overall DNS ecosystem: registration and operation. Registration is the process by which a domain name is registered in the DNS. On the operational side, DNS resolution is typically performed ISP- operated DNS recursive servers or public resolvers. On the BEREC statement that “*Also servicing an authoritative DNS server with a DNS resolver leads to a cost advantage*”, ICANN commented that the cost of running a server on a virtual machine is low, so there are little real savings in their view.

According to **ETNO**, BEREC dismisses possible competitive issues arising from DNS provided by entities other than ISPs not being subject to any regulation, even highlighting possible positive impacts on openness and convenience, while maintaining that the openness of the DNS provided by ISPs is ensured because it is subject to the OI regulation and that no consideration is made on the impact of DNS over HTTPS (DoH) resolvers on the ability of ECN/ECS providers to fulfil their obligations under EU law.

ETNO suggests that possible competition issues arising from all actors of the internet ecosystem but ISPs (e.g. DNS/DoH resolver) are underestimated, while at the same time hinting at additional areas of concern with regard to ISPs, even when these have already been addressed in adopted legislation.

In **GSMA’s** opinion, the DNS topic represents another example of the imbalance in the regulatory framework. GSMA believes that DNS services of ISPs are subject to provisions under the OI regulation, while those of Over the Top (OTTs) are not. GSMA suggests a future work on the competitive issues arising from DNS.

Telefonica welcomes the inclusion of the DNS function of Internet as a stand-alone market relevant for the functioning of the Internet ecosystem. According to Telefonica, the market changed from no one having a global dominance to players that either alone or in collaboration with few other players, dominate the market. According to Telefonica, these players different from ISPs can extend their market power to this adjacent market and increase their share overnight, just asking users with a biased question when opening the browser, using the OS, the device, etc. while the ISPs are subject to the obligations in the OI regulation.

Telefonica doesn’t share BEREC view that the DNS market should not present competition dynamics and potential bottlenecks and recommends the appropriate remedies in case a market failure is identified and recommends a deeper analysis.

BEREC’s response:



BEREC thanks stakeholders for their feedback and has carefully considered respondents' views related to DNS.

BEREC welcomes the clarifications on DNS registration and operation by **ICANN** and adapted the Draft Report concerning cost advantages.

BEREC notes that **ETNO, GSMA and Telefonica** perceive an imbalance in the regulatory framework concerning DNS and refers to paragraph 78a and 78c of the BERE Guidelines on the Implementation of the OI regulation¹³.

Regarding the suggestion by **GSMA and Telefonica** to work further on the topic of DNS, BERE will continue to monitor new developments in the market.

6.5 IP Interconnection (section 6.2.5 of the Draft Report)

The contributions from **CCIA, Google, Netflix and Meta** in this consultation all depict the interconnection market in similar way:

- These stakeholders generally agree with BERE assessment of the competition and openness dynamics in the IP interconnection markets, concluding that “*transit and interconnection players do not seem to pose major difficulties to competition*” (**CCIA**).
- They consider that large CAPs do not have a detrimental impact on interconnection services, as their investment efforts are beneficial to others, be it smaller CAPs or ISPs. As they invest in infrastructures like CDNs, they free-up capacity on backbone networks for other players and help preventing congestion.
- **Google, Netflix, Meta** put forward their open interconnection policies, seeking free-peering with most of their counterparts and enabling connection to free on-net CDNs. Some of them are also present at multiple IXPs (Google) or interconnection facilities (Meta, Netflix), making it geographically easy to connect.
- **CCIA, Google, Netflix, Meta** are mostly critical of the interconnection practices of large incumbent ISPs, which they identify as the main driver for interconnection disputes. It is noted that some of the incumbent ISPs force CAPs and smaller to ISPs to buy transit, which may result in poorer end-user quality of service, or paid-peering. The respondents see this as a consequence of the termination monopoly exploited by the ISPs, and a competition concern.
- **CCIA** cites the example of Deutsche Telekom, allowing peering only if CAPs and ISPs can meet a 1:1 strict traffic volume ratio and obliging others to pay transit fees. **CCIA** also

¹³ BoR (22) 81, BERE Guidelines on the Implementation of the Open Internet Regulation, 09.06.2022. <https://berec.europa.eu/en/document-categories/berec/regulatory-best-practices/guidelines/berec-guidelines-on-the-implementation-of-the-open-internet-regulation-0>

quotes the examples of the case *Init7 vs Swisscom*, in which “*the Swiss Federal Administrative Court found such practices, when conducted by an incumbent ISP which has a technical monopoly for access to its end customers, to be anticompetitive, that IP transit cannot be a substitute for peering, and that a traffic ratio of inbound and outbound traffic cannot be a price criterion*”.

- Additionally, **CCIA** and **Google** defend that there is no real difference in terms of access to quality-enhancing CDNs for smaller CAPs, as the market for commercial CDNs is competitive and providing alternatives to the CDN investment performed by larger CAPs.

On the opposite, **ETNO**, **Vodafone**, **Telefonica** have presented a different assessment of the interconnection market:

- **ETNO**, **Vodafone** and **Telefonica** insist on the development of large traffic asymmetries over the past years. In ETNO’s opinion, this fact is due to the negotiating power of the large CAPs; these have the possibility to bypass an operator if they disagree with the terms of a contract. They can reroute their traffic through any telco’s transit agreement, instead of negotiating directly a commercial relationship at a fee with the telco in question. In their opinion it is an impairment for both competition and openness.
- **Telefonica** and **Vodafone** see the OI regulation as a hindrance in their interconnection relationships, as CAPs are protected as end-user of the Regulation.
- **Telefonica** minimizes the positive impact of CDNs on their network, as they say that they have no effect on the access part of the network.
- **ETNO**, **Vodafone**, **Telefonica** insist on the growth of inbound traffic, especially video traffic, that is shifting the balance in the interconnection market.

BEREC’s response:

BEREC acknowledges that a large number of respondents shared their analysis and insights on the current discussion concerning the ISPs’ demand for a contribution by CAPs to their investments in ECN. BEREC will not address these points in the current report and refers to its work on the subject¹⁴.

Concerning the specific topics covered in the IP interconnection section of the report on the Internet ecosystem, stakeholders had split conclusions:

- **CCIA**, **Google**, **Netflix** and **Meta** seemed to agree with the conclusions of the BEREC report, adding that most negotiation issues stemmed from restrictive

¹⁴ Ibid footnote 3

practices by large ISPs, taking advantage of termination monopoly, whilst CAPs generally had open interconnection policies

- **ETNO, Vodafone, Telefonica** estimated that BEREC failed to see a market failure on IP interconnection; but this affirmation seems to be related only to the topic of possible contribution to network costs, not to negotiation of interconnection agreements or other possible technical interconnection issues.

In this perspective, BEREC does not see a need to amend this section and the topic will be further examined in other BEREC documents.

6.6 CDNs (section 6.2.6 of the Draft Report)

In **GSMA's** opinion, the economies of scale in the CDN market are systematically overestimated (p.49), as barriers to entry are in fact comparatively low, i.e., investments in server infrastructure are not sunk. This is in stark contrast to investments in other infrastructure elements, such as fibre lines.

EBU believes that the Draft Report is a comprehensive snapshot in time and provides a good picture of the complex interactions amongst the different elements composing the Internet ecosystem and would like to draw attention to the recently adopted EBU Technical Report on CDNs.¹⁵

Netflix observes that CDN services are a very competitive space, with fierce competition between well-established market players that have been around for decades (Akamai was founded in 1998), more recent entrants (Fastly, Cloudflare), large cloud platforms offering CDN services (Amazon Cloudfront or Google Media CDN), and local or regional players. **Netflix** suggests that BEREC should revise or remove the following statements that they believe are inaccurate:

- *"The CDN market on the other hand seems largely concentrated and barriers to entry are high because of the significant investment to have this geographical coverage needed to host QoS-sensitive applications and content efficiently" (section 6.2.6)*

BEREC's response:

BEREC recognises the need to correctly define the type of services provided when referring to CDNs. In case of *commercial* CDNs, the market appears to be concentrated around some big players. The market shares can be measured in different ways. As suggested by ENISA¹⁶, for instance, CDN providers can be ranked according to the number of websites

¹⁵ [Ibid footnote 5](#)

¹⁶ See ENISA, "Short paper on the security and operation of content delivery networks", 2022 – available under request

served from the “top 10 million” list¹⁷. With this approach, Cloudflare would have close to 80% market share. The International Data Corporation (IDC)¹⁸ also identifies a concentrated market around few CDN providers (Akamai is leading this list, followed by Amazon CloudFront, Cloudflare and Alibaba). Concerning barriers to entry, BEREC acknowledges the insights provided by the stakeholders. In recent years, big CAPs have been largely investing in CDNs deployment. However, such in-house CDNs are mainly deployed for the CAPs’ private usage and generally not provided to third parties on a commercial basis.¹⁹

BEREC maintains in the report that the market for commercial CDN appears to be concentrated, but adapts the final report to acknowledge that increasing investment in and deployment of CDNs (mostly for private usage) can be observed.

6.7 IaaS, PaaS and SaaS (sections 6.2.6 and 6.2.8.3 of the Draft Report)

ECTA notes that the Draft Report proposes a structure for the competitive analysis of cloud services that distinguishes on the one hand, between cloud computing (Infrastructure as a Service (IaaS) and Platform as a Service (PaaS)) which is being analysed together with Hosting and CDN services and on the other hand, software as a service (SaaS). Even though understanding the underlying systemic reason, ECTA does not agree with this approach because the competition and openness analysis of those three types of cloud services (IaaS, PaaS and SaaS) should go hand in hand given the characteristics of the market. ECTA highlights that SaaS services are often provided bundled with IaaS, and that it is clear leverage to cloud services occurs from market positions in desktop and mobile OSs, office suites, etc. Moreover, IaaS, PaaS and SaaS markets are highly concentrated in hands of few global players vertically integrated along the whole value chain.

ECTA informs that several ECTA members operate in IaaS markets as they can actively rely on their know-how and expertise in ECN provision for offering infrastructure-based services including the hardware (racks and servers) and location (data centres). In order to offer competitive IaaS services and making those services attractive for the businesses, they often rely on partnerships with very few global SaaS operators that dominate the market (in particular Microsoft). ECTA underlines that the leverage action that BEREC assumes in a theoretical manner is a reality in cloud services markets where the ECN providers are new entrant as IaaS providers and they necessarily need to offer their service bundled with SaaS.

¹⁷ This is the approach chosen by W3Tech (<https://w3techs.com/technologies/overview/proxy>)

¹⁸ “MarketScape Worldwide Commercial Content Delivery Network Services Vendor Assessment”

¹⁹ Google has both its ‘commercial’ Cloud CDN caters to cloud customers and a private CDN used for YouTube and other in-house Google content

BEREC's response:

BEREC acknowledges that there are different ways of describing the different elements of the Internet Ecosystem, and cloud services in particular. By describing IaaS and PaaS together, but SaaS separately, BEREC does not deny the strong links between the three layers of the cloud. The distinction made in the Draft Report is in line with other reports, such as ACM's market study into cloud services²⁰ and the GSMA report on the internet value chain²¹, both published recently. BEREC also recognises the leverage power among the different layers and/or other elements of the ecosystem, such as OSs, and office suites in particular. However, SaaS services as a whole consists of a wide variety of heterogeneous services. As a result of this heterogeneity, different players have a strong position on 'subsegments' of these markets. In contrast, IaaS and PaaS is much more concentrated as a whole.

The bundling and leveraging 'issue' is addressed in subchapter 6.2.8.3 about SaaS, but BEREC mentions this issue in subchapter 6.2.6.2 as well in the final report.

6.8 Attention intensive applications (section 6.2.7 of the Draft Report)

Meta believes that the ways in which people share and communicate have exploded thanks to dynamic competition and low barriers to entry and expansion. According to **Meta**, apps do not necessarily compete only against apps with similar functionality. **Meta** believes that the competition among app developers is robust based on the data that in 2021 the most downloaded app was TikTok, including messaging services apps like Telegram, Snapchat and Zoom as global top 10 downloaded apps²². Meta observes that consumers switch and multi-home between multiple apps and websites.

BEREC's response:

BEREC acknowledges that a great number of applications rely on capturing people's time and attention. However, as explained in the report, BEREC chose to focus the analysis notably on social networks and video-sharing platforms because those services present specific features. Indeed, they enable the exchange of user-generated content between different groups, including business users and consumers, whereas applications that provide access to premium content in live streaming or video on demand (VoD), such as Netflix, do not show this same feature. Therefore, even if, for example, both Facebook and Netflix aim at capturing users' attention, they do not appear to be strictly substitutable services. Another reason, also stated in the Draft Report, to address social networks and video-sharing platforms separately from applications such as Netflix, is their relevance for access to news and information. In this

²⁰ ACM, Market Study Cloud services, 2021, [Public Market study cloud services DEF \(acm.nl\)](#)

²¹ GSMA, The Internet Value Chain, 2022, [Internet-Value-Chain-2022.pdf \(gsma.com\)](#)

²² Data.ai State of Mobile 2022, available at <https://www.data.ai/en/go/state-of-mobile-2022>

regard, BEREC notes that social networks and video sharing platforms are regarded as important channels to deliver their editorial content.

Furthermore, concerning competition among app developers, BEREC notes in its Draft Report that attention-intensive application markets, are very concentrated around two players, Facebook (Meta) and YouTube (Google/Alphabet), in terms of number of users. As stated in the Draft Report, the survey conducted in the PPMi/ BEREC report²³ “*Analysing EU consumer perceptions and behaviour on digital platform’s for communications*”, published in June 2021, showed that when respondents were asked which of the social media platforms listed they used the most, 46,1 % answered Facebook (Meta), 27,7 % answered YouTube (Google/Alphabet), and 16,5 % answered Instagram, whereas only 2,5 % answered TikTok. The most recent data confirm this trend: according to Statista²⁴, the most popular social networks worldwide as of January 2022, in terms number of monthly active users, are first Facebook (Meta), with 2,9 billion users, and second YouTube (Google/Alphabet) with 2,7 billion users. WhatsApp (Meta) and Instagram (Meta) are ranked 3rd and 4th, with respectively 2 billion users and 1,5 billion users. TikTok only appears in 6th position with 1 billion users, and Snapchat and Telegram are respectively ranked 12th and 13th with 557 million users and 550 million users respectively.

Finally, BEREC recognises that users switch and multi-home between multiple apps and websites, and that they usually use several messaging services. However, Meta typically owns two widely used social networks apps with Facebook and Instagram, and two widely used messaging services with WhatsApp and Messenger (the latter, according to Statista, representing 990 million monthly active users in January 2022). All of these applications gather an important number of users, as showed in Statista’s figures, which supports the assertion of Meta having a major competitive advantage.

6.9 Other applications (section 6.2.8.1 of the Draft Report)

6.9.1 Live streaming and VoD content providers

According to **Telefonica**, though VoD services are identified as an active part of competitive dynamics in the Draft Report, at no point is the role that these providers play in the traditional Pay-TV market as substitute service providers. Telefonica suggests that it is necessary for NRAs to update the definition of relevant markets and to consider those services provided by

²³ BoR (21) 89, *Analysing EU consumer perceptions and behaviour on digital platform’s for communications*, PPMi, commissioned by BEREC, 10.06.2021.

https://www.berec.europa.eu/sites/default/files/files/document_register_store/2021/6/BoR_%2821%29_89_Consumer_Behaviour_and_Digital_Platforms_Report.pdf

²⁴ <https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/>

OTTs that directly compete with traditional telecommunications services, and are, therefore, substitute services for them.

BEREC's response:

BEREC thanks **Telefonica** for sharing its views on VoD services, and on the interest of addressing competitive dynamics for these services, including substitutability, that exceeds the scope of the report. BEREC addressed issues related to VoD and premium content in other reports²⁵ and will take into account Telefonica's views when addressing these issues.

6.9.2 NI-ICS (6.2.8.2)

GSMA Europe anticipates the important role of BEREC in supporting the enforcement of article 6 of the DMA and the obligation for gatekeepers on interoperability of NI-ICS.

Telefonica notes that although the Draft Report analyses the role of the different actors in the internet value chain, at no point does it study the role that these internet actors' services have as substitutes for traditional communications services or whether current regulation should be updated due to the predominant and changing role of OTTs over time. According to Telefonica, NI-ICS are sufficiently close substitutes from the end-user's perspective but current regulatory practices do not reflect this approach and NI-ICS provided by OTTs are not included in the relevant analysis and therefore remain unregulated. Telefonica is in favour of imposing new obligations on providers of NI-ICS, such as WhatsApp or Skype, which are competing with incumbent operators and are subject to less regulatory burden than them.

In **Meta's** opinion, in relation to messaging services specifically, BEREC alleges that "*lack of competition may also result by way of inefficiencies through imposed terms and conditions, exacerbated collection of data or little security and reliability*". Meta notes that there is very limited connection between alleged levels of concentration or competitiveness of a market and levels of privacy, security or reliability. According to Meta, this fails to recognise that NI-ICS must comply with GDPR and have also been recently subject to increased levels of regulation in this space. In particular, the EECC imposes requirements- not just on traditional communications services but also on NI-ICS - in terms of consumer transparency obligations, management of risks and disclosure obligations related to security of service, and protection of communications confidentiality.

Microsoft observes that the statements of the Draft Report with regards to NI-ICS portray these services with a 'one-size fits all' approach, not taking into consideration the very different nature of NI-ICS (e.g. there are large differences between B2C instant messaging apps and B2B productivity services), thus not capturing the different set of services they provide. Microsoft believes that ECN/ECS providers can and often do offer OTT services

²⁵ BoR (18) 35, BEREC report on the impact of premium content on ECS markets and the effect of devices on the open use of the Internet, 08.03.2018.

of their own or as a sell-through channel for third party OTT services. Microsoft believes that many telecommunication operators use OTT services as an attraction or even incentive to acquire and retain subscribers and that some operators went to the extent of offering zero-rated video streaming services as part of the subscription bundle.

BEREC's response:

BEREC thanks **GSMA Europe** for the comments on the role of BEREC regarding the DMA and interoperability of NI-ICS. For the Report on the Internet Ecosystem a comprehensive assessment of interoperability of NI-ICS is out of scope. However, BEREC prepared a Draft Report on Interoperability of NI-ICS²⁶, which covers the analysis of the relation between interoperability and encryption. The Draft Report is open for public consultation²⁷ at the moment of publication of this report.

Regarding the comment by **Telefónica**, BEREC recognises that market analysis is carried out on a case-by-case assessment by NRAs and competent bodies and encompasses the assessment of substitutability between interpersonal communication services. Furthermore, BEREC refers to the development of indicators assisting the analysis of NI-ICS in the BEREC Report on harmonized definitions for indicators regarding over-the-top services, relevant to electronic communications markets²⁸ and the PPMi report Analysing EU consumer perceptions and behaviour on digital platforms for communication²⁹ providing findings on the end-user perspective.

Regarding the comment by **Meta**, BEREC adapts its report by emphasizing that consumers tend to stick to a NI-ICS due to consumer inertia, limiting the role of security and privacy in competition.

Regarding the comment by **Microsoft**, BEREC has adapted the final report by pointing out the variety of business models of NI-ICS providers.

6.10 IoT (section 6.2.9 of the Draft Report)

Referring to the issue of permanent roaming, **MVNO Europe** states that IoT services do not limit themselves to pure M2M communications and may include connectivity services that somehow require partial human usage/interaction (e.g. infotainment services such as weather forecasts or navigation systems in a connected car). According to the MVNO Europe, some

²⁶ <https://www.berec.europa.eu/en/document-categories/berec/reports/draft-berec-report-on-interoperability-of-number-independent-interpersonal-communication-services-ni-ics>

²⁷ <https://www.berec.europa.eu/en/document-categories/berec/reports/draft-berec-report-on-interoperability-of-number-independent-interpersonal-communication-services-ni-ics>

²⁸ BoR (21) 127, BEREC Report on harmonized definitions for indicators regarding over-the-top services, relevant to electronic communications market, 30.09.2021.

<https://www.berec.europa.eu/en/document-categories/berec/reports/berec-report-on-harmonised-definitions-for-indicators-regarding-over-the-top-services-relevant-to-electronic-communications-markets>

²⁹ Ibid footnote 23

MNOs accept to enable permanent roaming services for pure M2M communications (e.g. telematics for diagnosing machines) while refusing to do so for non-pure M2M connectivity services – which are nonetheless essential in the IoT value chain/ecosystem. Without being able to provide those non-pure M2M connectivity services, MVNO Europe members are forcibly pushed out of the IoT market because industrial customers expect those non-pure M2M connectivity services to be included in the IoT solution that is offered. MVNO Europe invites BEREC to closely monitor this issue so that it can be addressed in future revisions of the Roaming Regulation.

BEREC’s response:

As stated in the updated BEREC wholesale roaming guidelines³⁰, “MNOs are expected to increasingly accept reasonable requests for wholesale roaming agreements which explicitly allow permanent roaming for M2M communications (Recital 21). Especially as the majority portion of current M2M communication does not generate much data, reasonable terms and charging models should allow for flexible wholesale roaming agreements. These may include tariff schemes which are not based on the volume of data consumed but instead, for example, on the number of connected machines per month, a flat price per device, level of quality of service (QoS), etc. BEREC expects that visited network operators will have a clear motivation to meet all reasonable requests for dedicated M2M communication technologies enabling the Internet of Things, such as LTE-M, NB-IoT, and the 5G IoT standards, etc.”

BEREC is aware that this topic is particularly crucial for MVNOs and will continue to monitor the topic and is planning to start analysing the M2M roaming issue further during 2023.

7. COMMENTS ON CHAPTER 7 – ANALYSIS OF OPENNESS

7.1 Enabling and discovery layer elements (section 7.2.1 of the Draft Report)

For **Meta** it is also important to recognise that, despite having some of the most popular apps in the world, Meta’s ability to innovate on its products and services and even reach its customers is determined, and in some cases, significantly limited, by the most popular mobile OSs, such as Apple’s iOS.

BEREC’s response:

³⁰ <https://www.berec.europa.eu/en/document-categories/berec/regulatory-best-practices/guidelines/berec-guidelines-on-the-application-of-article-3-of-regulation-eu-2022612-of-6-april-2022-on-roaming-on-public-communications-networks-within-the-union-wholesale-roaming-guidelines>

Concerning **Meta's** contribution, BEREC agrees that a prominent provider of one element (e.g. on the discovery layer) can still face limitative practices put in place by another prominent provider of a different element (e.g. on the enabling layer).

7.2 Devices (section 7.2.2 of the Draft Report)

GSMA and ETNO question BEREC's negative assessment of ISPs imposing specified equipment (as an exception to the general rule) when technically justified, as this is aimed at ensuring the performance levels for the end-user, and has been acknowledged and permitted by the regulation.

According to **MVNO Europe**, the paragraph on the device openness should be amended as follows (proposed additions underlined):

"Hence, users (among them, developers) might be restricted in the way they access the device's resources. For example, basic functionalities of the device may be available only to specific apps (e.g. NFC chip); there may also be limits to access to other resources, such as battery charge, memory space and CPU. This can be seen as a limit to software innovation at the device level. Basic functionalities of the device might also be blocked, malfunctioning or need to be set up manually depending on the electronic communication provider because of commercial restrictions that the device manufacturers put in place. For example, as referred to in paragraph 7.2.2, some features of Apple devices (e.g. MMS, Mobile Hotspot, VoLTE deployment, 5G access, VoWiFi, etc.) are blocked, not properly functioning or have to be set up manually depending on whether the mobile operator signed a so-called 'carrier partner agreement' with Apple. Other restrictions and limitations could also be introduced into the device, for instance port blocking, which may also impact users' choice."

CCIA argues that platform and ecosystem operators are not "enticing [users] to stay in the same environment to benefit from cross-device services and better interoperability of devices". Rather, in CCIA's view, users are demanding better cross-device services and interoperability and that is why ecosystem operators are expanding their product ranges, increasing product integrations, and integrating multiple functionalities within their ecosystem. CCIA considers that it is questionable whether these kinds of integrated ecosystems can be created in a way that meets consumers' expectations and demands in a way that sufficiently accommodates the demands of competitors. Regulatory interventions that require openness may inadvertently eliminate the benefits that caused consumers to choose more closed ecosystems, causing these more closed systems to disappear from the market. CCIA furthermore emphasizes that much of the value that platforms generate is through reducing the transaction costs of intermediation by sorting and organising information in a way that makes decisions easier and more efficient for end-users.

BEREC's response:



BEREC acknowledges the comments from **ETNO and GSMA**. Even though BEREC recognises that there might be technical justifications for imposing a specific equipment, namely to ensure a proper functioning, BEREC considers relevant to point out potential issues for users that may arise from that limitation. Against this background, BEREC does not see a need to amend the report.

BEREC welcomes the comment from **MVNO Europe** on the consequences arising from the failure to conclude commercial contracts between operators and device manufacturers, as it may affect users' experience. To this extent, BEREC will add a reference in this regard in section 7.2.2. of the final version of the report, in accordance with what was done in section 6.2.2., as proposed by MVNO Europe.

BEREC considers that both open and closed ecosystems can have advantages and disadvantages. Therefore, BEREC would disagree with the fact that closed ecosystems have no negative impact, at least from the openness perspective; in the sense of an open internet, the barrier for new service providers to enter parts of a closed ecosystem (which furthermore are concerning CAPs with a strong customer base) cannot be seen as having a positive impact.

7.3 IAS (section 7.2.3 of the Draft Report)

ECTA agrees with the analysis of openness performed by the Draft Report for the IAS market. According to ECTA, it is true that: *“by exerting technical control over the internet access, providers of IAS have the ability to influence an important part of the network layer. However, users are safeguarded by the OI regulation, as this regulation prevents restrictions or limitations to access not only to the services, content and applications over the IAS, but also to the provision of the internet-based services”*. In fact, the OI regulation has prohibited the ISPs from discriminating between internet traffic, applications, protocols, or providers of internet-based services. ECTA underlines those ongoing debates on the so-called 'OTT Fair Share', irrespectively from their outcome (which at the moment is uncertain), should not alter or undermine the OI regulation which provided greater choice, innovation and competition to European consumers and businesses.

Netflix agrees with BEREC's assessment that Internet access, and the ISPs that provide it, play *“a substantial role in the internet ecosystem as it is a gateway between end users and business users such as CAPs. By exerting technical control over the Internet access, providers of IAS have the ability to influence an important part of the network layer.”* The existence of this termination monopoly is one of the reasons for the OI regulation that Netflix strongly supports, and for which the European framework constitutes a global reference.

Telefónica agrees with pointing of the market competitiveness as the driver of market dynamism but argue the main reason safeguarding consumer choice is not OI regulation, but strong market competitiveness. Telefonica believes that the DMA and the DSA are precisely two EU legislative tools aiming to limit the market power abuse and limitations to consumer

choice as the new Internet bottlenecks, adding that there are no signs on restrictions to consumer choice by ISPs in the US market neither in EU, where the legal cases on potential breaches of the OI regulation have been limited since the regulation entered into force and related to diverging views on the OI regulation regarding commercial zero-rating practices.

GSMA welcomes the recognition that the application of the OI regulation has ensured that IAS remain open, but expresses their concern regarding the impact the OI regulation is having on the development of new digital services, in particular services *other than IAS, under the so-called “specialized services’ regime”* According to GSMA, despite the fact that the current guidance indicates that such use cases are not, per se, prohibited, the current guidance on the interpretation and application of the OI regulation makes it hard to identify, without taking a strict ‘innovation by permission’ approach, which content can be treated as a specialised service, as the criteria against which these are assessed are very challenging to apply in the context of an increasing volume of 5G-slice based specialised services. GSMA welcomes the BEREC’s recognition that gatekeepers can impact the openness of the internet ecosystem, and innovation.

BEREC’s response:

BEREC thanks stakeholders for their comments and agrees with **ECTA** and **Netflix** that the OI regulation has provided greater choice, innovation and competition to European consumers and businesses and that ISPs are an important gateway between end-users and business users.

BEREC agrees with **Telefonica** that market competitiveness is an important driver/indicator for consumer choice. However, BEREC believes that the OI regulation is safeguarding consumer choice and competition on the merits, by prohibiting ISPs from discriminating between internet traffic, applications, protocols, or providers of internet-based services. Against this background, BEREC does not see a need to amend the report.

BEREC does not share **GSMA’s** concerns with regards to the impact the OI regulation and the BEREC Guidelines on the implementation of the OI regulation³¹ have on new digital services, such as specialised services. As expressed already in 2018 BEREC Opinion on the OI Regulation³², the OI regulation seems to be leaving considerable room for the implementation of 5G technologies, such as network slicing, 5QI and Mobile Edge Computing. To date, BEREC is not aware of any concrete example given by stakeholders where the implementation of 5G technology as such would be impeded by the Regulation. BEREC has

³¹ Ibid footnote 13

³² BoR (18) 244, BEREC Opinion for the evaluation of the application of Regulation (EU) 2015/2120 and the BEREC Net Neutrality Guidelines, 06.12.2018.

<https://www.berec.europa.eu/en/document-categories/berec/opinions/berec-opinion-for-the-evaluation-of-the-application-of-regulation-eu-20152120-and-the-berec-net-neutrality-guidelines>

addressed this topic further in the 2022 BEREC Opinion on the OI regulation³³. Against this background, BEREC does not see a need to amend the report.

7.4 DNS (section 7.2.4 of the Draft Report)

On the BEREC statement that “*One example is that non-ISP DNS providers might have the incentive to differentiate the way they deal with DNS queries for addresses to their competitors*”, **ICANN** commented that this could easily be detected if the DNS stub resolver were to verify the integrity of the DNS response using DNSSEC validation, and that public resolver operators do not appear to be doing this.

Telefonica believes that while the OI regulation applies to the DNS service if provided by ISPs together with the IAS, other providers of DNS service are not subject to any alike obligations and thus these gatekeepers as identified in the report are legally able to implement actions restricting competition and consumer choice prohibited to ISPs by the OI regulation. Telefonica disagrees with BEREC’s analysis whether one player could potentially block a competitor, because this is not how a dominant provider will behave. According to Telefonica, it just needs to *convince* a user once or take profit of *consumer’s inertia* and the choice will stay almost forever.

BEREC’s response:

BEREC welcomes the clarification by **ICANN** concerning the possibility to detect differentiated treatment of DNS queries and adapted the report to reflect this in section 7.2.4.

Telefonica comments that DNS service providers that do not offer an IAS are not covered by the OI regulation, is correct and was already stated in the report. The example by BEREC of anti-competitive behaviour by DNS service providers is not limited to dominant players and it is not meant to give an in-depth analysis. BEREC has clarified the example in section 7.2.4 of the report.

7.5 IP interconnection (section 7.2.5 of the Draft Report)

CCIA proposes BEREC to clarify that the primary reason why small CAPs might not be able to provide the same quality of service [as large CAPs] is driven by incumbent ISPs’ restrictive interconnection practices. Incumbent ISPs are keen to leverage their internet access monopoly to either push smaller CAPs into paid-for transit agreements which they do not need to deliver traffic efficiently, or to impose paid-for peering conditions on them. Worse, smaller CAPs which cannot afford a transit and or paid-for private peering fee may see their traffic

³³ <https://www.berec.europa.eu/en/document-categories/berec/opinions/berec-opinion-for-the-evaluation-of-the-application-of-regulation-eu-20152120>

degraded. In addition, CCIA invites BERC to consider how small CAPs benefit from large CAPs' investments when using their hosting, transport and delivery capabilities.

Google believes that BERC's initial conclusion that small CAPs may not be able to provide the same quality of service to their internet-based services if large CAPs "*increasingly use dedicated, private capacity functioning as a backbone in parallel to the shared internet infrastructure*". around the impact of IP interconnection on smaller CAPs is unclear. According to **Google**, the capacity freed up on core and backbone networks because of this investment by large CAPs (e.g. in CDNs) can ensure that all content, including that from small CAPs, obtains a better quality of experience for users. Furthermore, commercial CDN platforms such as Akamai and Cloudflare are available to CAPs of all sizes – and Cloudflare even offers a "free tier" – so it should not be considered that small CAPs are necessarily at a disadvantage in Internet content delivery." The use of peering and CDN platforms improves the quality of experience for everyone.

Netflix argues that CDN services are a very competitive space, with fierce competition between well-established market players that have been around for decades, more recent entrants, large cloud platforms offering CDN services, and local or regional players. A new Internet-based streaming service could launch today, and obtain CDN coverage allowing it to deliver content efficiently around the world. Netflix therefore suggests BERC to revise or remove the following statement it finds inaccurate:

"Since large CAPs increasingly use dedicated, private capacity functioning as a backbone in parallel to the shared Internet infrastructure, this may lead to a situation where small CAPs are not able to provide the same quality of service to their Internet-based services. Users expect a relatively fast response of their services, otherwise they switch to faster services. This leads to problems for innovative start-ups that compete with large CAPs that are able to invest in dedicated capacity and run faster services." (section 7.2.5)

BERC's response:

BERC shares **CCIA's** assessment of restrictive IC practices by incumbents, as well as smaller CAPs difficulties.

Google's and Netflix's critical view of the access of smaller CAPs to infrastructures of CDN is debatable. The differences in bargaining power concerning possible negotiation of peering agreements are nonetheless still significant in this perspective. In this line, BERC has maintained the original text.



7.6 Hosting, CDN and cloud computing (IaaS and PaaS) (section 7.2.6 of the Draft Report)

Netflix argues that considerations about traffic ratios are not relevant, since CDNs deliver traffic according to the cold potato rule, i.e. closest to the users. While traffic ratios make sense in a hot potato routing environment with multiple interconnection points, where the receiving network shoulders the costs of transporting traffic between distant locations, traffic ratios should not apply in a cold potato environment where ISPs receive traffic next to their users. According to **Netflix**, ‘traffic ratios’ have been used as justification to engage in “selective” interconnection policies with perverse effects.

BEREC’s response

BEREC acknowledges that on-net CDNs, such as those mentioned by **Netflix**, have a different impact on interconnection and might be treated differently than, for instance, peering relations. This is however often the case and it is also a difference between smaller and bigger CAPs: CAP with no access to on-net CDN will always face negotiations on traffic ratios whenever they wish to enter a direct interconnection relationship.

8. COMMENTS ON CHAPTER 8 – FUTURE WORK

On the priorities and topics for BEREC’s future work on the Internet Ecosystem, several stakeholders (**GSMA, ETNO, ECTA, EBU, Microsoft, Internet Society and Telefonica**) specifically commented and made specific suggestions. The focus has been mainly on BEREC’s expertise in ex-ante regulation which BEREC should, on one hand, use in areas that are related to its traditional field of expertise, i.e. ECN/ECS, and on the other hand, to effectively apply to support other institutions like the EC in other fields.

In **GSMA**’s view, BEREC and its members will have a role to play in supporting the EC in its role as lead enforcer for the DMA. GSMA also believes that BEREC should use its experience in ex ante regulation for sharing best practices between Member States and developing analytical tools to help in identifying gatekeeping behaviour. GSMA anticipates BEREC will have a particularly important role in supporting the enforcement of Article 6 (Obligation for gatekeepers on interoperability of NI-ICS) given the significant overlap here with traditional (number-based) communications services. GSMA welcome the focus on digital platform regulation in the BEREC Internet Ecosystem report, in particular the focus on forthcoming *ex ante* regulatory regime which will be instituted under the DMA, taking effect in early 2023. GSMA finds it highly relevant not to underestimate the influence of the OS providers on the overall openness of the Internet and to acknowledge the lock-in effects of devices, and welcomes the recognition of the termination monopoly that is held by the OS providers.

ETNO notes that some of the elements for future work raised by BEREC may be better explored by other institutions and bodies, which have a clearer mandate to explore the issues



in depth, e.g. ENISA, competition authorities and the EC. One possible area for future work by BEREC could in ETNO's view be to explore whether innovations by some market players could hamper the ability of ECN/ECS providers to fulfil their obligations under EU law, and, where appropriate, BEREC should promote new standards and innovations.

ECTA remarks that no real holistic independent study has been performed by policy makers or NRAs since the liberalisation of the telecom markets to understand the financial performances of the sector and therefore recommends BEREC to prepare an in-depth study of the performance of the ECN/ECS markets in terms of Return on Capital Employed (ROCE). ECTA suggests that BEREC gives priority to the items demonstrably connecting the internet ecosystem to the competition problems encountered by ECN, ECS and IAS providers. ECTA also finds it necessary to analyse the competition problems in the Internet of Things markets.

The **EBU** proposes BEREC to consider further exploring the question of discoverability/findability/prominence of content of general interest and also the consumption of public service media in the car.

The **Internet Society** proposes that BEREC in its future work recognises the evolving and fast-changing nature of the Internet and suggests that regulators conduct specific Internet Impact Assessments to any policy proposal that could affect the characteristics of the infrastructure. The Internet Society refers to its work³⁴ on this, that can be used when analysing the impact of any policy proposal.

Telefonica welcomes a renewed BEREC interest in analysing the Internet ecosystem and market dynamics. Telefonica, in light of the DMA and the DSA, argues that it is time now to go beyond pure technical analysis of market dynamics and directly address identified market failures. In Telefonica's view, identified topics such as Fair Share Payments, DNS, Traditional regulated markets and OI regulation, deserve further BEREC involvement and work in the coming months.

Microsoft acknowledges that in its past reports from 2012 and 2017, BEREC has recognised the important roles and value of the infrastructure investments made by content providers, such as CDNs and effective peering agreements, in the overall effectiveness of market-driven IP interconnect practices and in the context of net neutrality. Microsoft commends BEREC for these past studies and recognition and urges BEREC to continue to advocate its conclusions and recommendations against unwarranted regulatory intervention.

MVNO Europe proposes BEREC to closely monitor the issue of the exclusion from the scope of non-pure M2M connectivity services so that it can be addressed in future revisions of the Roaming Regulation.

³⁴ Internet Society, Internet Impact Assessment Toolkit, 2021
<https://www.internetsociety.org/issues/internet-way-of-networking/internet-impact-assessment-toolkit/>

BEREC's response:

Concerning the **GSMA's** contribution, BEREC is already actively contributing to supporting the EC in the implementation of the DMA. On top of BEREC's work on ex ante regulation of digital gatekeepers, BEREC has also recently published a report on the interoperability of NI-ICS³⁵. In line with its strategic priority to support competitive, sustainable and open digital markets, and with the role that BEREC will play within the High-Level Group for the enforcement of the DMA, BEREC plans to keep monitoring the evolutions in the internet ecosystem and the practices of the different players. Concerning devices and OSs, BEREC has adapted the corresponding paragraph accordingly.

Concerning **ETNO's** suggestion to focus future work on topics such as the impact of the Big Tech companies' innovation and practices on ECN/ECS providers, BEREC refers to its Work Programme 2023³⁶ where several items will analyse this point (e.g. BEREC Report on the entry of large content and application providers in electronic communications network and services markets, or the report on cloud services and edge computing).

On the proposal from **ECTA** on preparing a study on the performance of ECN/ECS markets in terms of economic parameters as ROCE, although not included in the section of future work, being very specific to the ECS/ECN sector, BEREC considers it interesting and will take it into account for future BEREC work programmes.

On the issue of priority for work related to ECN/ECS markets and the impact of other elements in the Internet Ecosystem, raised by **ECTA** and **ETNO**, BEREC has prioritised in the section on future work on the Internet ecosystem the topics that are more in relation with ECN/ECS markets that are increasingly intertwined with IT services. In this line, the proposal from **EBU** on exploring issues related to content discoverability and prominence, as well as consumption of media in the car, although BEREC considers it an interesting topic, is not envisioned as high-priority work as other issues identified for future work. Notwithstanding, it will be taken into account in the future.

BEREC agrees with the **Internet Society** on the evolving and fast-changing nature of the Internet, and thanks the Internet Society for the reference to the documentation on the Internet Impact Assessment Toolkit developed by this organization, that will be taken into account by BEREC and its members when analysing the impact of policy proposals in relation to the Internet Ecosystem.

³⁵ <https://www.berec.europa.eu/en/document-categories/berec/reports/draft-berec-report-on-interoperability-of-number-independent-interpersonal-communication-services-ni-ics>

³⁶ Ibid footnote 8

On the proposals from **Telefonica** about topics on payments on IP interconnection, traditional regulated markets and OI regulation are already being subject to BEREC reports³⁷.

BEREC thanks **Microsoft** for its input on previous work done by BEREC and considers that all regulation to be applied must be justified, and when so, regulatory intervention should take place.

On the proposal from **MVNO Europe**, BEREC is planning to start analysing the M2M permanent roaming issue further during 2023, as this will be part of its work programme.³⁸

³⁷ <https://www.berec.europa.eu/en/document-categories/berec/reports/summary-report-berec-open-ran-workshop-24-may-2022>; <https://www.berec.europa.eu/en/document-categories/berec/reports/berec-report-on-the-implementation-of-the-open-internet-regulation-2022>;

³⁸ Ibid footnote 8