



Lifting a regulatory millstone around 5G investors' neck – 5G network slicing versus EU-net neutrality?

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Abstract

Highly quality-sensitive 5G use cases, such as metaverse-type applications, connected and autonomous driving or digitalised health applications, are the future of the mobile internet. These use cases will rely on 5G network slicing technology to ensure

scalability and individually calibrated Quality of Service (QoS) levels. New electronic communications services ensuring specific QoS levels are subject to EU-net neutrality rules laid down in Regulation (EU) 2015/2120 and are currently being assessed by national regulatory authorities (NRAs) on a case-by-case basis. As acknowledged by the European Commission (EC) in its recent report on the implementation of the provisions of Regulation (EU) 2015/2120, this case-by-case approach results in legal uncertainty and acts as barrier to investments and innovation. In particular, it is often unclear to internet service providers (ISPs) if innovative quality-sensitive content, applications or services may be delivered via specialised services in accordance with Article 3 (5) of Regulation (EU) 2015/2120. The purpose of the article is to show a way to enhance legal certainty in the application of Article 3 (5) of Regulation (EU) 2015/2120 while preserving the fundamental digital rights of end-users regarding equal and non-discriminatory treatment of data traffic by ISPs as well as transparency. Specifically, striking this delicate balance could be achieved by introducing rebuttable presumptions to shift the burden of proving that “*optimisation is necessary in order to meet requirements of the content, applications or services for a specific level of quality*” (Article 3 (5) subpara. 1 of Regulation (EU) 2015/2120) and that specialised services are “*not [...] to the detriment of the availability or general quality of internet access services for end-users*” (Article 3 (5) subpara. 2 of Regulation (EU) 2015/2120) away from ISPs and towards NRAs.

Introduction

The creation of a connected continent has been a key priority of the EU ever since the European Commission (EC) issued its Communication “A Digital Single Market Strategy for Europe” in 2015 (EC, 2015). The 2030 Digital Compass (European Commission, 2021) and the European Declaration on Digital Rights and Principles for the Digital Decade (European Commission, 2022) respectively have acknowledged the role of electronic communications technology and network connectivity as an indispensable basis for the EU's economic success and resilience as well as the sustainable development of the European society. This requires the opening of new markets to investments in electronic communications infrastructures, technologies and services to improve welfare by ensuring the international competitiveness of European enterprises, the provision of public services, human and industrial safety as well as security.

Current developments within the mobile internet ecosystem indicate a trend towards highly quality-sensitive content, applications and services, such as metaverse-type applications, connected and autonomous driving or digitalised health applications (Smirnova et al., 2019; European Commission, 2021). This trend is reflected on both the supply and demand side. In order to be deployed effectively, safely, securely and at scale, these contents, applications and services will rely on electronic communications technology specifically tailored to their respective Quality of Service (QoS)¹ requirements. Some of these contents, applications and services are anticipated to have, inter alia, stringent demands regarding reliable and (ultra) low latency connectivity. In addition to their specific QoS

requirements, these new contents, applications and services have to be deployed on scalable mobile networks, which, in particular, are capable of reacting to sudden peaks in data traffic to enable safety and security critical applications and services.

Therefore, their delivery is expected to require purpose-specific network slices deploying customised and application-driven virtual networks that can flexibly scale and adapt to meet the heterogeneous and dynamically changing QoS requirements of an evolving range of different use cases. Furthermore, there are situations where network operators may be building out additional network capacity specifically to support these new use cases. For example, network operators might ensure coverage across rural road networks to support connected or autonomous vehicles. In the future mobile networks will likely be predominantly used to support these specific use cases, rather than for traditional internet access services (IAS).

Excellent and secure connectivity for everybody and everywhere in Europe is essential for a society in which every business and citizen can fully participate. Therefore, the EC has set the ambitious goal of achieving EU-wide gigabit connectivity by 2030 (European Commission, 2021). With regard to the technological realisation, the EC is focused on the more sustainable next generation fixed, mobile and satellite connectivity, with very high capacity networks (see Article 2 no. 2 of Directive (EU) 2018/1972²), including 5G, being rolled out. However, meeting the economic and societal demands of this new mobile internet ecosystem regarding individually calibrated QoS levels and scalability will require additional technological

innovations, in particular the development and deployment of 5G network slicing.

5G network slicing creates a network architecture that enables the multiplexing of virtualised and independent logical networks on the same physical network infrastructure. Each network slice is an isolated end-to-end network tailored to fulfil diverse QoS requirements requested by particular content, applications or services. Network slices can be either designed to deliver one specific use case or to meet the generic QoS requirements of specific categories of traffic. 5G network slicing also provides a tremendous amount of flexibility and scalability for highly quality and safety critical applications and services. As a result, ISPs are able to react to sudden peaks in traffic by upscaling bandwidth to enable safety critical applications and services and to prevent or mitigate the effects of mobile network congestion. Scalability also allows for the adaption to reduced volumes of traffic by downscaling bandwidth to preserve valuable network resources ensuring the resource and energy efficient usage of mobile networks to reduce CO2 emissions in line with the objectives of the European Green Deal (European Commission, 2019).

Simultaneously, the EC is committed to safeguard fundamental digital rights such as on equal and non-discriminatory treatment of data traffic by ISPs, which are guaranteed by Regulation (EU) 2015/2120³ and commonly referred to as the principle of net neutrality (European Commission, 2022). Regulation (EU) 2015/2120 aims to protect both end-users⁴ and the continued functioning of the open internet ecosystem as an engine of innovation (Recital no. 1 of Regulation (EU) 2015/2120).

However, the provisions of Regulation (EU) 2015/2120, in particular its Article 3, may act as a barrier to innovations and investments in the electronic communications sector as it is sometimes unclear whether certain experimental services and technologies, such as electronic communications services delivered via 5G network slicing, are permissible under net neutrality rules.

While drafting Regulation (EU) 2015/2120, the Union legislator foresaw the general need for differentiation in terms of QoS. Therefore, Regulation (EU) 2015/2120 allows for the implementation of reasonable traffic management measures based on objectively different technical QoS requirements of specific categories of traffic (Article 3 (3) subpara. 2 of Regulation (EU) 2015/2120) and the offering of specialised services which are optimised for specific content, applications or services, where the optimisation is necessary in order to meet their specific QoS requirements (Article 3 (5) of Regulation (EU) 2015/2120). However, national regulatory authorities (NRAs) charged with the interpretation, application and enforcement of Regulation (EU) 2015/2120 apply a case-by-case approach to new technologies and services. This approach is reinforced by the Body of European Regulators for Electronic Communications (BEREC) in its guidelines on the implementation of Regulation (EU) 2015/2120 (BEREC Guidelines) (BEREC, 2022b). In its recent report on the implementation of the provisions of Regulation (EU) 2015/2120 the EC has acknowledged that this case-by-case approach results in a “*lack of legal certainty*”, which in turn “*may have a chilling effect on investments and innovation*” (European Commission, 2023).⁵ Against this background, the EC has

recognised the demand for greater legal certainty in the application of Regulation (EU) 2015/2120 and a possible need for clarifications by the EC (European Commission, 2023):

“Greater legal certainty could therefore be beneficial to both innovators and consumers in the future. How to achieve it, by signalling that new high-performance services should be possible within the scope of the Regulation, and whether such ‘signposting’ should be done via a clarification in the BEREC guidelines (e.g. in shorter intervals commensurate with market and technological developments) or by the Commission, is one of the matters to focus on in the near future.”

In light of these concessions, this paper will precisely outline the unclarity of Article 3 of Regulation (EU) 2015/2120 as well as the uncertainty in terms of its application, in particular its paragraph 5, and the resulting throttling effect on the development and deployment of innovative electronic communications technologies, such as 5G network slicing (3.). This paper will then compare possible policy remedies to be adopted by the EC⁶ (4.) and present a concrete proposal for new regulatory formats to enhance legal certainty in the application of Article 3 (5) of Regulation (EU) 2015/2120 to specialised services delivered via 5G network slicing (5.).

Section snippets

Literature

Literature on the legal assessment of 5G network slicing under net neutrality regulations is rare and usually focusses on specific

frictions between net neutrality and 5G network slicing.

Smirnova et al. (2019) briefly describe the offering of specialised services as a use case for 5G network slicing and provide measuring algorithms for the quality of IAS and application-specific quality of specialised services.

Yoo and Lambert (2019) provide a detailed discussion of potential tensions between...

QoS differentiation under EU-net neutrality rules

Article 3 (3) subpara. 1 of Regulation (EU) 2015/2120 lays down a general obligation for ISPs to treat all traffic equally: *“Providers of internet access services shall treat all traffic equally, when providing internet access services, without discrimination, restriction or interference, and irrespective of the sender and receiver, the content accessed or distributed, the applications or services used or provided, or the terminal equipment used.”* This obligation reflects the...

The EC's policy toolkit to enhance legal certainty in the application of article 3 (5) of regulation (EU) 2015/2120

There are two main types of action for the EC to enhance legal certainty in the application of Article 3 (5) of Regulation (EU) 2015/2120: Communication and Recommendation.¹⁶ Although not explicitly provided for in the TFEU, Communications play an important role in the EC's practice....

Proposal for new regulatory formats to enhance legal certainty in the application of article 3 (5) of regulation (EU) 2015/2120 to specialised services delivered via 5G network slicing

To begin with, in the case at hand a Commission Recommendation should be addressed to NRAs as well as BEREC and contain guidance on the development of new regulatory formats for the appropriate and forward-looking application of Article 3 (5) of Regulation (EU) 2015/2120 within the scope of NRA's and BEREC's independence. When developing new regulatory formats, BEREC should assume its role as defined in Regulation (EU) 2018/1971 by drawing upon the expertise available in the NRAs, thereby...

Conclusion

The EC acknowledges the considerable legal uncertainty surrounding the assessment of Article 3 (5) of Regulation (EU) 2015/2120 regarding highly quality-sensitive content, applications and services delivered via 5G network slicing. The adoption of a Commission Recommendation addressed to NRAs and BEREC is the most effective way to enhance legal certainty in the application of Article 3 (5) of Regulation (EU) 2015/2120 to specialised services delivered via 5G network slicing and, as a result,...

Declaration of interest

The article is based on a legal opinion by Christian Koenig for a german 5G provider....

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