



Bundesnetzagentur

Net Neutrality in Germany Annual Report 2017/2018



Net Neutrality in Germany

Annual Report 2017/2018

Report of the Bundesnetzagentur to the European Commission and BEREC

pursuant to Article 5(1) Regulation (EU) 2015/2120

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Courtesy translation

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I. Introduction

1. Regulation (EU) 2015/2120 laying down measures concerning open internet access¹ aims to establish common rules to safeguard equal and non-discriminatory treatment of traffic in the provision of internet access services and related end users' rights. It aims to protect end-users and simultaneously to guarantee the continued functioning of the internet ecosystem as an engine of innovation.²
2. In accordance with Article 5(1) national regulatory authorities (NRAs) must publish reports on an annual basis on their monitoring and findings, and provide these reports to the Commission and BEREC.
3. BEREC published "Guidelines on the Implementation by National Regulators of European Net Neutrality Rules" on 30 August 2016 in accordance with Article 5(3).³ These Guidelines are designed to provide guidance on implementing the obligations of national regulatory authorities and contribute to the consistent application of this Regulation.
4. In accordance with the BEREC Guidelines (paragraph 182), NRAs should publish their reports on an annual basis by 30 June for the period 1 May to 30 April. The present report, which covers the period from 1 May 2017 to 30 April 2018, is to be submitted by 30 June 2018.
5. By publishing this report, the Bundesnetzagentur fulfils its reporting duty on its monitoring and findings for the second year of application of Regulation (EU) 2015/2120. Also by the publication of this report the Bundesnetzagentur simultaneously fulfils its reporting duty under section 43a(1) third sentence of the German Telecommunications Act (TKG).
6. The report focuses on the following issues: the safeguarding of open internet access (Article 3), transparency measures (Article 4), supervision and enforcement (Article 5), and penalties (Article 6).
7. The report covers significant activities of the Bundesnetzagentur with respect to the following:
 - the investigation of zero rating offers (Article 3(2) in conjunction with Article 3(1) and Article 3(3); see paragraphs 16-24, 36);
 - consumer complaints relating to traffic management measures (Article 3(3); see paragraphs 33-35, 37-41) and low data transmission rates (Article 4(1)(d) in conjunction with Article 4(4); see paragraphs 48-49);

¹ Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015 laying down measures concerning open internet access and amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services and Regulation (EU) No 531/2012 on roaming on public mobile communications networks within the Union, Official Journal 2015, L310/1. Any article without reference to an Act or to a Regulation shall be understood to refer to Regulation (EU) 2015/2120.

² See recital 1 of the Regulation.

³ Non-authorised translation of the Guidelines:

https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Breitband/Netzneutralitaet/LeitlinienDeu.pdf?__blob=publicationFile&v=3

- adoption of a clarification that clearly defines the terms "significant discrepancy, continuous or regularly recurring" with respect to speed parameters in accordance with Article 4(4) (see paragraphs 60-67);
- operation of a quality monitoring mechanism (section 43a(3) TKG and Article 5(1); see paragraphs 73-85).

II. Supervision and enforcement of Regulation (EU) 2015/2120 on open internet access

Competence

8. In Germany, the Bundesnetzagentur is responsible for enforcing the rules on net neutrality under Regulation (EU) 2015/2120.
9. Depending on the matter at issue, the Bundesnetzagentur may consult with other authorities, for example the Federal Cartel Office (Bundeskartellamt), the state media authorities and the Federal Commissioner for Data Protection and Freedom of Information (BfDI). Data protection falls under the joint responsibility of the Bundesnetzagentur and the BfDI (see section III.3.1 below).

Methods of supervision and enforcement

10. Under Article 5(1), the Bundesnetzagentur shall closely monitor and ensure compliance with Articles 3 and 4. The Bundesnetzagentur is responsible *ex officio* for enforcing Regulation (EU) 2015/2120 on open internet access. Its main information sources are complaints, the public media and other sources (eg information from other authorities or from internet access providers who inform the Bundesnetzagentur of a specific business model).
11. In many cases the Bundesnetzagentur will take action following a complaint (complaint-based approach). The Bundesnetzagentur will thus support the complainant if the complainant's concerns are justified. By taking this approach, the Bundesnetzagentur is able to identify the main issues from the end-user's perspective and take appropriate measures vis-à-vis the provider concerned if the infringements take on a larger dimension.
12. In addition, the Bundesnetzagentur takes into account other information about any infringement of Regulation (EU) 2015/2120 (eg information from public media or from the internet).
13. Providers of internet access services are required to carry out a self-assessment of the compatibility of their contracts with the net neutrality rules set out in Regulation (EU) 2015/2120 and, if necessary, must amend their contracts accordingly. There is no obligation to notify the Bundesnetzagentur. Notwithstanding the above, the Bundesnetzagentur may intervene if they find any contracts for internet access are defective.

III. Enforcement activities of Regulation (EU) 2015/2120 and the findings of monitoring work

14. The Bundesnetzagentur's activities related to various provisions of the Regulation.

1. The safeguarding of the open internet – Article 3

1.1. Agreements and commercial practice – Article 3(1) and (2)

Article 3(1) and (2) Regulation (EU) 2015/2120

(1) End-users shall have the right to access and distribute information and content, use and provide applications and services, and use terminal equipment of their choice, irrespective of the end-user's or provider's location or the location, origin or destination of the information, content, application or service, via their internet access service.

This paragraph is without prejudice to Union law, or national law that complies with Union law, related to the lawfulness of the content, applications or services.

(2) Agreements between providers of internet access services and end-users on commercial and technical conditions and the characteristics of internet access services such as price, data volumes or speed, and any commercial practices conducted by providers of internet access services, shall not limit the exercise of the rights of end-users laid down in paragraph 1.

15. During the reporting period, several of the Bundesnetzagentur's investigations or complaints received related to Article 3(1) and (2). Of particular interest were zero-rating offers and connectivity problems due to a lack of provision of publicly available IPv4 addresses.

Zero-rating

16. During the reporting period, there were two major zero rating-offers on the German market: the tariff option "StreamOn" offered by Telekom Deutschland GmbH and "Vodafone Pass" offered by Vodafone GmbH.

Deutsche Telekom: StreamOn

17. The StreamOn tariff option is a zero-rating offer that can be added at no extra charge to the MagentaMobil M and L tariffs and the MagentaEins tariff. Data consumption for the audio and video streaming of partner content does not count towards the data allowance for the respective tariff. The tariff option has been on offer since 19 April 2017. The following applies to the respective tariffs:

- M tariff: StreamOn Music (the zero-rating of audio streaming of partner content) can be added as an option.
- L tariff: StreamOn Music and Video (the zero-rating of audio and video streaming of partner content) can be added as an option. In the L tariff the available bandwidth is reduced, this means that for video streams of both partner and non-partner content the bandwidth is restricted to a maximum of 1.7 Mbit/s ("video throttling"). This leads to a 480p resolution, thus videos cannot be displayed in HD quality. StreamOn customers may deactivate the bandwidth reduction at any time for a period of up to 24 hours if they want to watch videos in HD quality. In this case, the data consumed will count towards the data allowance and thus there is no zero-rating.
- MagentaEins tariff: the customer can add StreamOn Music and Video as an option, i.e. the zero-rating of audio and video streaming of partner content. Videos can be streamed in HD quality; there is no bandwidth reduction in this tariff.

18. Only audio and video streams from content partners are zero-rated. Generally, participation in "StreamOn" is open to any audio or video content provider. However, the content provider must conclude an agreement with Deutsche Telekom and meet the requirements set out in the general terms and conditions for content providers.⁴

19. The Bundesnetzagentur has prohibited the use of video throttling as part of "StreamOn" by decision of 15 December 2017 (see paragraph 36 for more details). Additionally, through the intervention of the Bundesnetzagentur, Telekom Deutschland GmbH has revised its General Terms and Conditions for the Participation of Streaming Providers in the zero-rating offer.⁵ Previously these general terms and conditions did not permit either private content providers to participate or those content providers to participate that offer a download functionality in addition to their streaming content. Although, in practice, Telekom Deutschland GmbH had already accepted such content providers as content partners. Telekom Deutschland GmbH amended its General Terms and Conditions for the Participation of Content Partners accordingly as of 1 March 2018. The amendments met the requirements of the Bundesnetzagentur for the open, transparent and non-discriminatory participation of content providers in StreamOn.

20. Following the decision on StreamOn, one provider of audio and video content complained that it was not able to participate in Deutsche Telekom's StreamOn zero-rating offer. This content provider used the BitTorrent protocol to distribute content. The content provider has since implemented a streaming client on its website, which means that at the present time some of the provider's services meet the requirements of the General Terms and Conditions for the Participation of Content Partners in StreamOn. The Bundesnetzagentur is investigating whether Telekom Deutschland GmbH's requirements, which are preventing the

<https://www.telekom.de/hilfe/mobilfunk-mobiles-internet/mobiles-internet-e-mail/streamon/allgemeine-geschaeftsbedingungen.pdf?samChecked=true>

⁵ See the Bundesnetzagentur press release of 15 December 2017 at

https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Allgemeines/Presse/Pressemitteilungen/2017/15122017_StreamOn.pdf

provider's participation with respect to some of its services, are objectively justified. This investigation is still in progress.

Vodafone: Vodafone Pass

21. Since 26 October 2017, Vodafone GmbH in Germany (Vodafone) has been offering "Vodafone Pass" as an add-on option to its Red and Young tariffs. This allows so-called "passes" from the categories audio, video, chat and social to be added. Services in these categories offered by partner companies may be used by the Vodafone Pass customers without the data consumed being deducted from their tariff data allowance (also known as zero-rating). The "Video Pass" can be added to the RED/Young M and RED/Young L tariffs. At a higher level, the Vodafone Pass zero-rating offer differs in one key factor from the Telekom Deutschland GmbH StreamOn zero-rating offer: whilst video traffic is throttled from the start with StreamOn, Vodafone has not yet implemented video throttling for Vodafone Pass, although Vodafone has contractually reserved the right to do so. In the reporting period, the Video Pass contains the following clause: "Vodafone reserves the right to limit videos to standard definition (SD) quality (480p)." The terms and conditions of participation for content providers that want to participate in the Vodafone Pass are set out in the Service Provider Agreement. Initially, the terms and conditions of participation were not published on the internet. Participation was originally only for those content providers that offered their services via an app.
22. The Bundesnetzagentur has carefully examined the Vodafone Pass zero-rating offer *ex officio*, primarily in view of the statutory requirements of net neutrality. In doing so, the Bundesnetzagentur consulted with Vodafone GmbH and questioned the market players (including content providers and Internet service providers), state media authorities, the Federal Cartel Office and professional associations.
23. Furthermore, efforts were made to amend the terms of the Vodafone Pass contract. In particular, this involved making the individual Vodafone Passes clearly distinct from each other and specifying those services that are not part of the zero-rating offer.
24. After having concluded its investigations, the Bundesnetzagentur objected to the Vodafone Pass under net neutrality aspects, amongst others. The main criticisms were the reservation of video throttling in its original form, the non-publication of terms and conditions of participation for content providers, and the need for content providers to offer an app in order to take part in the Vodafone Pass. Meanwhile, Vodafone has amended its offer; in view of this amendment, the Bundesnetzagentur does not see any need to continue the investigation at present.⁶ Unlike the StreamOn zero-rating offer from Telekom, video traffic is currently not throttled with the Vodafone Pass. The reservation of video throttling is designed in such a way that videos are only restricted to SD quality (480p) provided this is

⁶See Bundesnetzagentur press release of 15 June 2018, https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Allgemeines/Presse/Pressemitteilungen/2018/20180615_Vodafone.pdf

legally compliant (especially in accordance with Regulation (EU) 2015/2120) having regard to administrative practice and court rulings. The Bundesnetzagentur assumes that Vodafone will take the result of the StreamOn court proceedings into account should video throttling ever be introduced. Vodafone has stated that it will inform the Bundesnetzagentur three months prior to the introduction of any video restriction. This gives the Bundesnetzagentur sufficient time to prohibit any inadmissible video throttling. Vodafone Pass was originally designed in such a way that content providers without an app could not participate. Third parties claimed during the investigation that this posed an obstacle that could affect not only those content providers' competitive opportunities but also media pluralism. Vodafone has since presented an amended version of the service provider agreement, which eliminates these concerns. The agreement has also been published on the Vodafone home page. The Bundesnetzagentur's requirements for a transparent, open and non-discriminatory participation of content providers in the Vodafone Pass have now been met.

Connectivity problems caused by a lack of public IPv4 addresses

25. During the reporting period, the Bundesnetzagentur received several complaints about connectivity problems due to a lack of publicly available IPv4 addresses and the use of Network Address Translation (NAT). These complaints are caused by the ongoing scarcity of IPv4 addresses.⁷ This scarcity can be solved in various ways, for instance through the joint use of single IP addresses by more terminal equipment and/or end users (using NAT) or through migration to the IPv6 protocol (which is not backwards compatible with the IPv4 protocol ie "incapable of interoperability"). In the first solution mentioned above, several end users are connected to the internet via a single public IPv4 address. The terminal equipment itself is connected to the provider's network with private IPv4 addresses. This is technically implemented using NAT. The individual end user is not able to have direct communication via the internet with a distant terminal due to a lack of public IPv4 addresses; that is to say, there is no direct end-to-end connectivity available to the end user. Although the end user can use simple applications, such as calling up web pages, they cannot make use of all the functionalities of internet access as they cannot be uniquely identified "from outside" via a public IP address. Thus the end user cannot operate any system via their internet access that must have true end-to-end connectivity to remote sites in the internet, for example a server offering applications or services. Nor can the end user directly access their home network (LAN), for instance to control and use their own systems such as Smart Home. In the second solution mentioned above, there is still the problem with migration to IPv6 that not all internet pages are accessible because migration in its entirety has not yet taken place. At present, IPv4 addresses are still largely being used. However, as the IPv4 and IPv6 protocols cannot speak to each other, a user that only has an IPv6 address cannot communicate with other users that only use IPv4. For this reason, many providers use what is referred to as a "dual stack" solution, ie they make both IPv4 and IPv6 addresses available to their customers.
26. Some of the complaints received were about a providers of internet access services (fixed network) that provided its customers with private IPv4 addresses with NAT. Consequently, it was not possible to have IPv4 end-to-end connectivity to specific applications. The Bundesnetzagentur requested the internet access service provider to provide comments and remedial action, and provisionally noted in this connection that the restricted accessibility to services and applications constituted an infringement of Article 3(1) of Regulation (EU) 2015/2120. End user rights include that end users may access and distribute applications or services, information and content, may use and provide applications and services, and may use terminal equipment of their choice. These end user rights were not fully ensured in this case. A final decision has yet to be made.

⁷ Available IPv4 addresses have been exhausted at the regional registries (in Europe: RIPE), thus they are no longer being issued. Consequently, to some extent IPv4 addresses are currently being traded between companies.

27. A similar case was found in the network of a mobile internet access service provider. In this case an end user complained of not being able to connect to the games server for his portable games console. As the games console itself did not permit access to the mobile network, attempts were made to set up the connection by way of tethering using the end user's smart phone. Again, the use of NAT in connection with the assignment of private IPv4 addresses resulted in a lack of connectivity. No formal investigation has been initiated during the reporting period.
28. The Bundesnetzagentur has noticed an increase in complaints about connectivity problems when using private IPv4 addresses. It is likely that this problem will get bigger in the future; especially if future digital services require access to a unique public IP address. The connectivity problem will only be fully resolved once there has been a complete migration to public IPv6 addresses. In its final decisions relating to connectivity problems in the use of private IPv4 addresses (and NAT), the Bundesnetzagentur will on the one hand factor in the scarcity of IPv4 addresses but, on the other hand, will also appropriately enforce end user rights. One possible compromise could be that internet access providers will not have to provide their customers with public IPv4 addresses in every case but only upon request, and only provided that this is economically reasonable and only as long as IPv4 (ie the RFC 791 standard) is a current internet standard. As soon as the IPv4 standard is classified as historic, this obligation would cease. The internet access service providers that use NAT as a solution are bound under Article 4(1) Regulation (EU) 2015/2120 to set out the contractual information in such a way that makes their customers aware that they perhaps may not be able to reach all access points in the internet and of the possibilities that are open to them to establish an IPv4 end-to-end connection.

Exclusion of the use of VoIP and peer-to-peer

29. In the reporting period the Bundesnetzagentur requested a reseller to refrain from contractually prohibiting the use of voice over IP (VoIP) and peer-to-peer. Such prohibition of use constitutes a fundamental infringement of end user rights under Article 3(1). Upon the Bundesnetzagentur's intervention, the reseller updated its contractual information. Overall the number of complaints about this issue was very low. In the prior reporting period, the Bundesnetzagentur had made it clear at information events for the sector that any exclusion of specific uses was a clear infringement of the Regulation. Meanwhile, providers appear for the most part to have stopped the previously observed practice.

Inapplicability of the Regulation

30. Some complaints related to matters to which the provisions of net neutrality are not applicable. For instance, individual consumers had complained that they were not able to use their telecommunications provider's VoIP service "nomadically". However, as this relates to a contract for voice telephony and not a contract for internet access services, Regulation (EU) 2015/2120 is not applicable. Provisions concerning net neutrality apply only to the provision of internet access services.

31. For the same reason, the rules on net neutrality do not apply to contracts on the use of private networks (such as on access to a university network). Such private networks do not constitute an internet access service, ie they are not a public telecommunications service that offers access to the internet and thus a connection to practically all internet endpoints irrespective of the network technology and the terminal equipment used.

1.2. Traffic management - Article 3(3)

Article 3(3) Regulation (EU) 2015/2120

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.

The first subparagraph shall not prevent providers of internet access services from implementing reasonable traffic management measures. In order to be deemed to be reasonable, such measures shall be transparent, non-discriminatory and proportionate, and shall not be based on commercial considerations but on objectively different technical quality of service requirements of specific categories of traffic. Such measures shall not monitor the specific content and shall not be maintained for longer than necessary.

Providers of internet access services shall not engage in traffic management measures going beyond those set out in the second subparagraph, and in particular shall not block, slow down, alter, restrict, interfere with, degrade or discriminate between specific content, applications or services, or specific categories thereof, except as necessary, and only for as long as necessary, in order to:

- (a) (a) comply with Union legislative acts, or national legislation that complies with Union law, to which the provider of internet access services is subject, or with measures that comply with Union law giving effect to such Union legislative acts or national legislation, including with orders by courts or public authorities vested with relevant powers;*
- (b) (b) preserve the integrity and security of the network, of services provided via that network, and of the terminal equipment of end-users;*
- (c) (c) prevent impending network congestion and mitigate the effects of exceptional or temporary network congestion, provided that equivalent categories of traffic are treated equally.*

32. During the reporting period, the Bundesnetzagentur started various investigations into possible infringements of Article 3(3).

Blocking

33. During the reporting period the Bundesnetzagentur became aware of the traffic management measures of internet access service providers that permanently blocked specific ports, ie for longer than one month. This involved internet service service providers for fixed networks (cable) and one mobile internet access service provider. Consequently, applications using the stated ports could not exchange data via the internet access service. The Bundesnetzagentur, however, regards the traffic management practice as justified pursuant to Article 3(3)(b) provided it protects the integrity and security of the network, the services provided via the network, or the end user's terminal equipment. The two cases of blocked ports involved ports that are typically and regularly used for attacks on terminal equipment as these ports are known to have security vulnerabilities that can be abused.

Furthermore, these ports are essentially used by applications that are usually used only within a LAN and not over the internet, so the end user would not expect any major restriction in using the internet access service.

34. Following a complaint, the Bundesnetzagentur became aware of a telecommunications company that blocked incoming IP traffic in mobile communications if it had not been initiated by the end user of the mobile connection. Consequently, this made it impossible to control a terminal device connected to a mobile device (for example an agricultural installation). Data traffic is only permitted if the owner of the mobile connection initiates the transmission. Essentially, the reasons given for this traffic management measure were to protect the consumer against possible cyber attacks and bill shocks, and the threat of network failures. The Bundesnetzagentur is particularly investigating whether, in the present case, the blocking of unknown incoming connections on the grounds of network security and integrity is compatible with Article 3(3)(b) of Regulation (EU) 2015/2120. As at 30 April 2018 the investigation had not been finalised.
35. In one case the Bundesnetzagentur investigated the blocking of a URL *ex officio*. From press articles it was found that Vodafone had blocked access to the Kinox.to Website for its customers with a cable network connection. Customers that tried to access to the Kinox.to site were redirected to a block page, which informed them that the portal was temporarily unavailable due to a copyright claim. Vodafone was obliged to do this under a temporary injunction issued by the regional court of Munich. The Bundesnetzagentur checked whether the facts of the case were true and asked to see the temporary injunction. The Bundesnetzagentur concluded that the Vodafone measures were justified based on the rule of exception in accordance with Article 3(3) third sentence (a) of Regulation (EU) 2015/2120.

Throttling

36. On 15 December 2017, the Bundesnetzagentur issued an administrative order against Telekom Deutschland GmbH under section 126(2) TKG for breaches of provisions on network neutrality, amongst others, under Regulation (EU) 2015/2120.⁸ The Bundesnetzagentur has prohibited the use of video throttling in the add-on option for the MagentaMobil L, L Plus, L Premium and L Plus Premium tariffs as this breaches the requirement of non-discrimination applicable to all data traffic. Under StreamOn the data transmission rate for video streaming in the MagentaMobil L tariff is reduced to such an extent that videos can only be received in SD quality. According to the Bundesnetzagentur's findings, there is no objective technical reason to reduce the data transmission rate as video services do not need throttling. Conversely, according to the applicable regulations, the performance of an individual network does not provide grounds for restricting the data transmission rate for data-intensive communications. The Bundesnetzagentur's prohibition does not affect the other MagentaMobil tariffs, including the tariffs for MagentaEins customers, as regards net neutrality. Telekom Deutschland GmbH filed a complaint for summary proceedings against

⁸ https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Breitband/Netzneutralitaet/Entscheidung_zu_StreamOn.pdf

the Bundesnetzagentur's decision with Cologne Administrative Court and, simultaneously, filed an appeal. As at 30 April 2018 neither the summary proceedings nor the appeal proceedings had been completed.

37. Moreover, there were individual cases in which consumers suspected that internet access providers were throttling the YouTube service in their networks. The Bundesnetzagentur's findings, however, did not detect any such throttling being performed. A lower data transmission rate when using certain video services can be due to a variety of causes; it may be caused by interconnections in the internet that are not subject to regulation, or even be due to the connection of the video streaming provider's server to the internet access service provider's infrastructure.
38. Individual consumer complaints were made against one internet access service provider's prepaid tariff, which advertised that even when the data credit had been consumed, the WhatsApp messaging service could still be used. The consumers considered this treatment of WhatsApp to be discriminatory towards other services, including messaging services. The Bundesnetzagentur's investigations discovered that the data transmission rate for this tariff was reduced to a maximum 32 or 56 kbit/s – depending on the tariff version – following consumption of the data allowance. The provider advertised that this was sufficient to send text messages by WhatsApp. The use of throttling was non-discriminatory; WhatsApp was treated the same as any other service, including any other messaging services. The Bundesnetzagentur also determined that there was no indication in the contractual provisions that the use of other messaging services was not permitted in the contract or that these were blocked, or that the use of WhatsApp was excluded from a reduction in the data transmission rate following complete consumption of the contractually agreed units. In this respect there was no breach of the non-discrimination obligation for all data traffic under Article 3(3).

Terminal equipment restrictions (no net neutrality infringement)

39. In the reporting period there were also individual complaints about restrictions on the use of applications in terminal equipment provided by the internet access service provider. The complainants alleged that this was a breach of the net neutrality provisions. However, in these types of case, Regulation (EU) 2015/2120 was not applicable as these cases did not involve measures that occurred within the internet access service or that restricted end users in their right to use the terminal equipment of their choice. Rather the restrictions were caused by restrictions in the configurations of the terminal equipment (routers) that the internet access service customer was offered by the access service provider in connection with the internet access service. The subscribers were free to use their own routers, whose use did not result in any disturbance. The internet access service itself was thus not affected.
40. Some of these complaint cases involved the blocking of access to email servers of providers whose domain name was not on a white list. The white list could only be amended by the internet access provider. Nevertheless, the end user could deactivate the filter function in the configuration menu. In another case, only specific dynamic domain name service (DNS)

services could be used in the router, which were set as default by the internet service provider (ISP). As these measures took place in the downstream servers or routers and not in the network, this ruled out any infringement of net neutrality.

41. In a further case, an end user complained that individual emails had not reached him. The email server had rejected the emails due to a policy setting. In this context the checking and filtering of emails was carried out by the email service. The emails were rejected due to the application settings, in this case within the email server of the email service provider. The provisions on net neutrality do not apply here as the email provider's server does not form part of the internet access service. Nor does this case involve a restriction in the terminal equipment that is used in connection with the internet access service, rather this involves the default behaviour of the application itself.

1.3. Data protection and obligations for the protection of privacy - Article 3(4)

Article 3(4) Regulation (EU) 2015/2120

Any traffic management measure may entail processing of personal data only if such processing is necessary and proportionate to achieve the objectives set out in paragraph 3. Such processing shall be carried out in accordance with Directive 95/46/EC of the European Parliament and of the Council (10). Traffic management measures shall also comply with Directive 2002/58/EC of the European Parliament and of the Council (11).

42. In Germany during the reporting period both the Federal Commissioner for Data Protection and Freedom of Information (BfDI) and the Bundesnetzagentur were responsible for monitoring the data protection obligations in line with telecommunications law. The two authorities share supervisory responsibility.
43. They monitored the confidentiality of electronic communications. The BfDI is responsible on behalf of the state supervisory authorities for checking compliance with data protection provisions. However, the executive powers lie with the Bundesnetzagentur.
44. If the BfDI becomes aware of any violations of data protection provisions, it can inform the Bundesnetzagentur of this. The Bundesnetzagentur can then enforce the data protection obligations by way of an administrative procedure or can punish any violations by administrative fines. Moreover, there is a formal cooperation process between the Bundesnetzagentur and the BfDI for the obligatory filing of personal data breaches pursuant to Article 4(3) of the E-Privacy Directive⁹ (transposed into German law in section 109a TKG), thus the two authorities inform one another as soon as they receive notification of breaches of data privacy by a provider of internet access services.
45. In the reporting period, the StreamOn offer of Deutsche Telekom GmbH was checked by the Bundesnetzagentur, which in turn contacted the BfDI concerning the data protection

⁹ Directive 2002/58/EC, amended by Directive 2006/24/EC and 2009/136/EC, for the consolidated version see <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2002L0058:20091219:DE:PDF> (German)

legislation aspects. Generally, where the customer has clearly given consent, traffic identification measures by a provider are permissible under data protection legislation.

46. Furthermore, it must be noted that the General Data Protection Regulation (Regulation (EU) 2016/679) of the European Parliament and of the Council of 25 May has replaced Directive 95/46/EC. The E-Privacy Regulation, which is currently being discussed at a European level, is likely to replace Directive 2002/58/EC of the European Parliament and of the Council. The E-Privacy Regulation will probably also lead to changes in data protection supervision in Germany.

1.4. Services other than internet access services (specialised services) - Article 3(5)

Article 3(5) Regulation (EU) 2015/2120

Providers of electronic communications to the public, including providers of internet access services, and providers of content, applications and services shall be free to offer services other than internet access services which are optimised for specific content, applications or services, or a combination thereof, where the optimisation is necessary in order to meet requirements of the content, applications or services for a specific level of quality.

Providers of electronic communications to the public, including providers of internet access services, may offer or facilitate such services only if the network capacity is sufficient to provide them in addition to any internet access services provided. Such services shall not be usable or offered as a replacement for internet access services, and shall not be to the detriment of the availability or general quality of internet access services for end-users.

47. No complaints about specialised services were addressed to the Bundesnetzagentur. Nor have providers of internet access services contacted the Bundesnetzagentur with questions about future business models that include specialised services.

2. Transparency measures - Article 4

2.1 Contractual arrangements - Article 4(1)

Article 4(1) Regulation (EU) 2015/2120

Providers of internet access services shall ensure that any contract which includes internet access services specifies at least the following:

(a) information on how traffic management measures applied by that provider could impact on the quality of the internet access services, on the privacy of end-users and on the protection of their personal data;

(b) a clear and comprehensible explanation as to how any volume limitation, speed and other quality of service parameters may in practice have an impact on internet access services, and in particular on the use of content, applications and services;

(c) a clear and comprehensible explanation of how any services referred to in Article 3(5) to which the end-user subscribes might in practice have an impact on the internet access services provided to that end-user;

(d) a clear and comprehensible explanation of the minimum, normally available, maximum and advertised download and upload speed of the internet access services in the case of fixed networks, or of the estimated maximum and advertised download and upload speed of the internet access services in the case of mobile networks, and how significant deviations from the respective advertised download and upload speeds could impact the exercise of the end-users' rights laid down in Article 3(1);

(e) a clear and comprehensible explanation of the remedies available to the consumer in accordance with national law in the event of any continuous or regularly recurring discrepancy between the actual performance of the internet access service regarding speed or other quality of service parameters and the performance indicated in accordance with points (a) to (d);

Providers of internet access services shall publish the information referred to in the first subparagraph.

48. With respect to transparency measures under Article 4(1), the complaints addressed to the Bundesnetzagentur particularly concerned the discrepancy between the actual performance and the contractually agreed download speeds pursuant to Article 4(1)(d). The majority of complaints involved fixed networks and only a few related to mobile networks. Cases relating to transparency measures for traffic management are dealt with in paragraph 50 (see also paragraphs 33-35 on the assessment under Article 3(3)). No complaints about the transparency requirements under Article 4(1)(b), (c) and (e) were addressed to the Bundesnetzagentur during the reporting period.
49. The Bundesnetzagentur dealt with the complaints on broadband speed discrepancies following the complaints procedure (see section 2.2) and, since April 2017, taking into account the Bundesnetzagentur's draft administrative notice specifying the undefined legal terms pursuant to Article 4(4) ("significant discrepancy, continuous or regularly recurring regarding speed") and, since July 2017, its final administrative notice on this (see paragraphs 59-65).
50. In view of the blocking of ports (see for assessment under Article 3(3) also paragraph 33), and following talks with the industry in view of the transparency requirements in Article 4(1), the Bundesnetzagentur has set out an admissible approach. In accordance with Article 4(1)(a), internet access service providers must ensure that their contracts for internet access contain information on how the traffic management measures applied by the provider may impact the quality of the internet access, the privacy of the end user and the protection of the end user's personal data. In the case of blocked ports, it is sufficient that the contractual information contains reference to the possibility of port blocking and the associated possible detrimental impact on individual applications or services that use the

blocked ports. For the remainder, reference can be made to an internet page where long-term measures, ie those that last longer than one month, must be stated as well as the ports being blocked.

Report in accordance with section 43a(3) third sentence para 1 TKG

51. Pursuant to section 43a(3) third sentence para 1 TKG, the Bundesnetzagentur publishes an annual report on its surveys and findings, which presents, among others, the extent to which providers of publicly accessible telecommunication services provide the information required under section 43a(2) TKG and under Article 4(1) of Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015 laying down measures concerning open access and amending Directive 2002/22/EC on universal services and Regulation (EU) No 531/2012 on roaming on public mobile communications networks within the Union (OJ L310 of 26 November 2015, page 1).
52. The Bundesnetzagentur takes action, in particular, in response to complaints (complaint-based approach). Moreover, the Bundesnetzagentur makes spot checks of the corresponding wording of the providers in their general terms and conditions.
53. Based on these checks, the following picture has emerged for the Bundesnetzagentur: During the reporting period, fixed network providers have increasingly provided information on speeds in accordance with Article 4(1)(d) in their general terms and conditions. The providers typically refer to specific figures for the respective speeds or express them as a percentage of the maximum speed. Advertised speeds typically correspond to maximum speeds. During the reporting period, providers of mobile communication also increasingly provided information on the corresponding speeds in their general terms and conditions.

2.2 Complaints procedure - Article 4(2)

Article 4(2) Regulation (EU) 2015/2120

Providers of internet access services shall put in place transparent, simple and efficient procedures to address complaints of end-users relating to the rights and obligations laid down in Article 3 and paragraph 1 of this Article.

54. The Bundesnetzagentur consumer advice service has designed a standard complaints procedure, which it has presented to the industry. In particular, this procedure governs the formal requirements of a complaint in the event that the contractually agreed speeds are not achieved. Internet access providers were asked to provide the Bundesnetzagentur with the name of a contact person so that the Bundesnetzagentur can deal with consumer complaints relating to Article 4, especially those concerning the speed of internet access, as well as issues and complaints on contractual transparency. Most internet access service providers have designated a contact person.

Number of complaints

55. The Bundesnetzagentur forwards complaints from end users, for which no solution has been reached between the end user and the internet access service provider, to the provider. To ensure that only substantiated complaints are forwarded, the Bundesnetzagentur asks the consumer to measure the speed of their internet access service in advance, at least 20 times, with the broadband measurement tool made available by the NRA (see paragraph 65). A direct comparison of the number of complaints or queries with those of the previous year based on the statistics provided is not possible. In the relevant reporting period, fewer than fifty substantiated complaints were submitted for the purposes of Article 4(4). In a large number of complaints a solution was found that was in the complainant's interests. Moreover, it is possible to submit a request for a dispute settlement procedure to the Bundesnetzagentur.
56. The Bundesnetzagentur is not able to force the provider to terminate the contract prematurely or to compensate the consumer, however the Bundesnetzagentur carefully monitors the solutions offered by the provider.
57. Legal remedies for consumer claims for damages are governed by civil law. No specific, additional remedies for consumer redress have been introduced for net neutrality.
58. Although, a simultaneous rise in general queries and complaints concerning this issue has been recorded. The Bundesnetzagentur is monitoring the number of end user complaints on the speed of internet access services. Whereas in 2015 and 2016, the Bundesnetzagentur received between 150 and 300 complaints each year, during the reporting period about 1200 queries and complaints were received about this issue. However, the number must be seen in proportion to the total number of queries and complaints received each year (about 81,000). An exact statistical assessment of the complaints or a direct comparison of the statistics is difficult because in many of the consumer complaints the problems are intermixed or several problems are addressed at once. Generally, it cannot be excluded that the increased interest is due to the publication of the administrative notice specifying the undefined legal terms "significant discrepancy, continuous or regularly recurring" pursuant to Article 4(4) (see paragraphs 59-65).

2.3 Monitoring mechanism - Article 4(4)

Article 4(4) Regulation (EU) 2015/2120

Any significant discrepancy, continuous or regularly recurring, between the actual performance of the internet access service regarding speed or other quality of service parameters and the performance indicated by the provider of internet access services in accordance with points (a) to (d) of paragraph 1 shall, where the relevant facts are established by a monitoring mechanism certified by the national regulatory authority, be deemed to constitute non-conformity of performance for the purposes of triggering the remedies available to the consumer in accordance with national law.

This paragraph shall apply only to contracts concluded or renewed from 29 November 2015.

59. In its Guidelines BEREC clearly set out that a monitoring mechanism provided by a national regulatory authority and implemented for the purpose of Article 4(4) should be considered a certified monitoring mechanism (see BEREC Guidelines, paragraph 161). Thus the Bundesnetzagentur considers its "Breitbandmessung" (broadband measurement tool) to be such a certified monitoring mechanism. Additional information on the Bundesnetzagentur's monitoring mechanism is given in paragraphs 73-85.

Clarification issued for the undefined legal terms

60. In the last reporting period, the Bundesnetzagentur held a consultation on an administrative notice specifying the undefined legal terms in Article 4(4) ("significant discrepancy, continuous or regularly recurring [...] regarding speed"). A final administrative notice was published on 4 July 2017.
61. The administrative notice applies to download speeds of fixed broadband lines and makes the legal terms stated above more manageable for end users in asserting their rights vis-à-vis their internet access providers. The intention is to hold Internet access service providers accountable for the speeds that are stated in the contract and advertised.
62. The clarification firstly addresses the substance of the undefined legal terms in Article 4(4) and, secondly, lays down guidelines for the verification process using the Bundesnetzagentur's monitoring mechanism ("Breitbandmessung").
63. In the Bundesnetzagentur's view, a significant discrepancy, continuous or regularly recurring in download speeds of fixed broadband lines within the meaning of Article 4(4) is deemed to exist if
1. 90% of the contractually agreed maximum speed is not achieved at least once on at least two measurement days, or
 2. the normally available speed is not achieved in 90% of the measurements, or

3. the speed falls below the contractually agreed minimum on at least two measurement days.
64. The occurrence of such a discrepancy in one of these cases suffices for the finding of a significant discrepancy, continuous or regularly recurring, in the download speed and thus non-compliance with the contractually agreed performance.
65. The Bundesnetzagentur deems the following requirements of scope and type of measurement to be necessary when using the broadband monitoring mechanism in the verification process (see paragraph 59):
1. At least 20 measurements must be taken.
 2. The measurements must be taken on at least two separate days.
 3. The number of measurements is to be spread equally over the two days, so that at least 10 measurements are taken on a specific day.
 4. The measurements must be taken using a LAN connection.
 5. The measurements are to be carried out using the installable version of the *Breitbandmessung* (broadband monitoring mechanism).

In addition, the Bundesnetzagentur's recommendations for the performance of measurements are to be observed.

66. An installable version (desktop app) was published on 2 May 2018 and since then has been available for download from the *Breitbandmessung* webpage. Earlier, the Bundesnetzagentur had held a workshop with stakeholders on the intended installable version, where the requirements of an installable version and the parameters to be included were discussed. Also during the workshop, the recommendations envisaged by the Bundesnetzagentur were addressed. Moreover, all interested parties were given ample opportunity before the introduction of the desktop app to state their opinion and to carry out tests.

Report in accordance with section 43a(3) third sentence para 2 TKG

67. In accordance with section 43a(3) third sentence para 2 TKG, the Bundesnetzagentur publishes an annual report on its surveys and findings, which presents the extent to which significant discrepancies, continuous or regularly recurring, were determined between the quality of service measured under section 43a(3) second sentence and the information given in the contract under Article 4(1)(1)(d) of Regulation (EU) 2015/2120.
68. As the desktop app was only published after the reporting period on 2 May 2018, there is insufficient data and an insufficient number of relevant consumer complaints to allow any valid assumptions to be made regarding the stated discrepancies.

2.4 Additional legislative measures - Article 4(3)

Article 4(3) Regulation (EU) 2015/2120

The requirements laid down in paragraphs 1 and 2 are in addition to those provided for in Directive 2002/22/EC and shall not prevent Member States from maintaining or introducing additional monitoring, information and transparency requirements, including those concerning the content, form and manner of the information to be published. Those requirements shall comply with this Regulation and the relevant provisions of Directives 2002/21/EC and 2002/22/EC.

69. At the national level, additional transparency requirements were adopted by way of an ordinance on the promotion of transparency in the telecommunications market ("transparency ordinance"). This ordinance lays down the publication of information and additional measures for cost control on the telecommunications market.
70. The transparency ordinance entered into force on 1 June 2017. It requires providers of fixed-line networks and mobile communications to provide more transparency when offering internet access services.
71. Providers of internet access services must provide product information sheets where the consumer can quickly see the essential contractual provisions in a simple way before concluding the agreement. The product information sheet contains details of the available data transmission rates, the term of the agreement and the monthly costs. Consumers are also informed of the contractually agreed data allowance (if relevant).¹⁰
72. Moreover, consumers receive the right with the aid of reliable measurement results to be informed of the quality of their internet access service, in particular on the available data transmission rates and how the rates achieved compare to the contractually agreed maximum speed. The annex to the ordinance sets out the format for this information. The provider of the internet access service must therefore inform the consumer of possible means of measuring the speed, for example by referring to the broadband measurement tool offered by the Bundesnetzagentur (see <https://breitbandmessung.de>).

¹⁰ Sample product information sheet: www.bundesnetzagentur.de/tk-transparenzverordnung

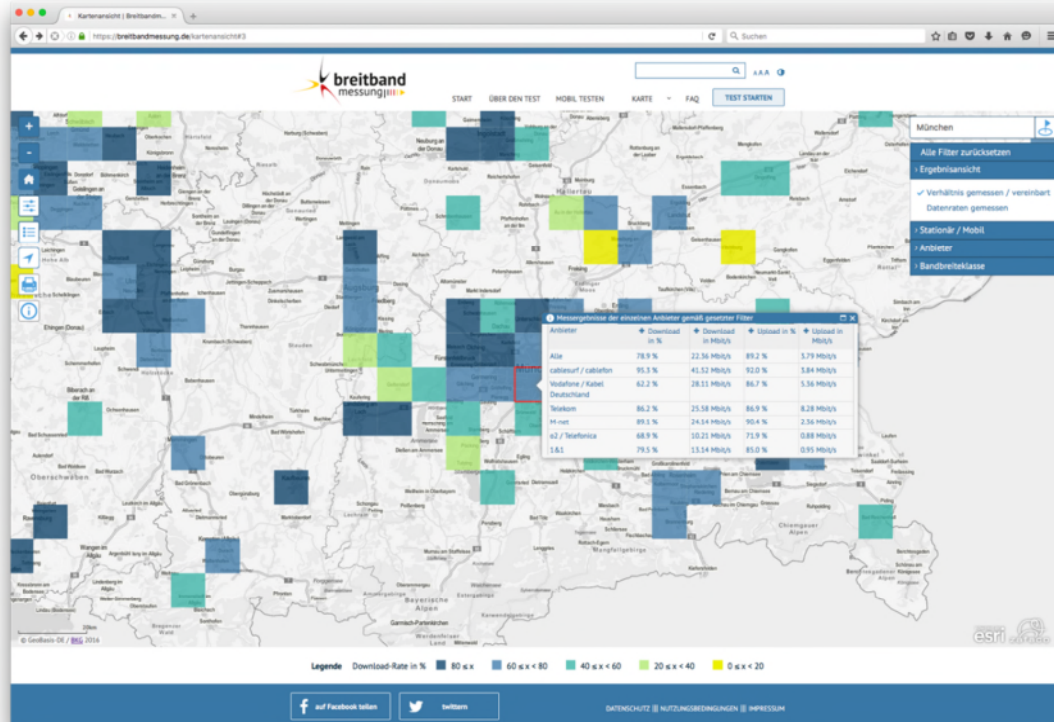
3. Supervision and enforcement – Article 5

Article 5(1)(1) Regulation (EU) 2015/2120

National regulatory authorities shall closely monitor and ensure compliance with Articles 3 and 4, and shall promote the continued availability of non-discriminatory internet access services at levels of quality that reflect advances in technology. For those purposes, national regulatory authorities may impose requirements concerning technical characteristics, minimum quality of service requirements and other appropriate and necessary measures on one or more providers of electronic communications to the public, including providers of internet access services.

Broadband speed tests

73. The Bundesnetzagentur provides a monitoring mechanism, the "Breitbandmessung", which allows consumers to monitor the quality and performance of their broadband internet access. A browser-based test is used for fixed-line broadband and an app-based one (Android and iOS) for mobile lines. The measurement process used in the actual testing is technically identical for both fixed and mobile lines. The test measures the data transmission rate in both the download and upload directions. The measurement result is presented as an absolute value and as a relative value in relation to the contractually agreed speed. Thus, the monitoring mechanism allows the data transmission rate actually measured of a broadband connection to be compared with the maximum data transmission rate contractually agreed. In addition, the delay and packet loss parameters are measured. However, only the delay is presented to the end user.
74. The monitoring mechanism is used to collect measurement samples via crowdsourcing. The results are presented in an annual report on broadband measurement. The second annual report was published on 17 January 2018.
75. Besides this, a map view, displaying measurement results using NUTS-3-Clusters and grid cells, allows the end-user to get an impression of the data transmission rates measured in specific regions. While the annual report covers fixed time periods the maps are updated daily and display results for the last 6 and 12 months as well as for an overall time period since the beginning of the broadband measurement.



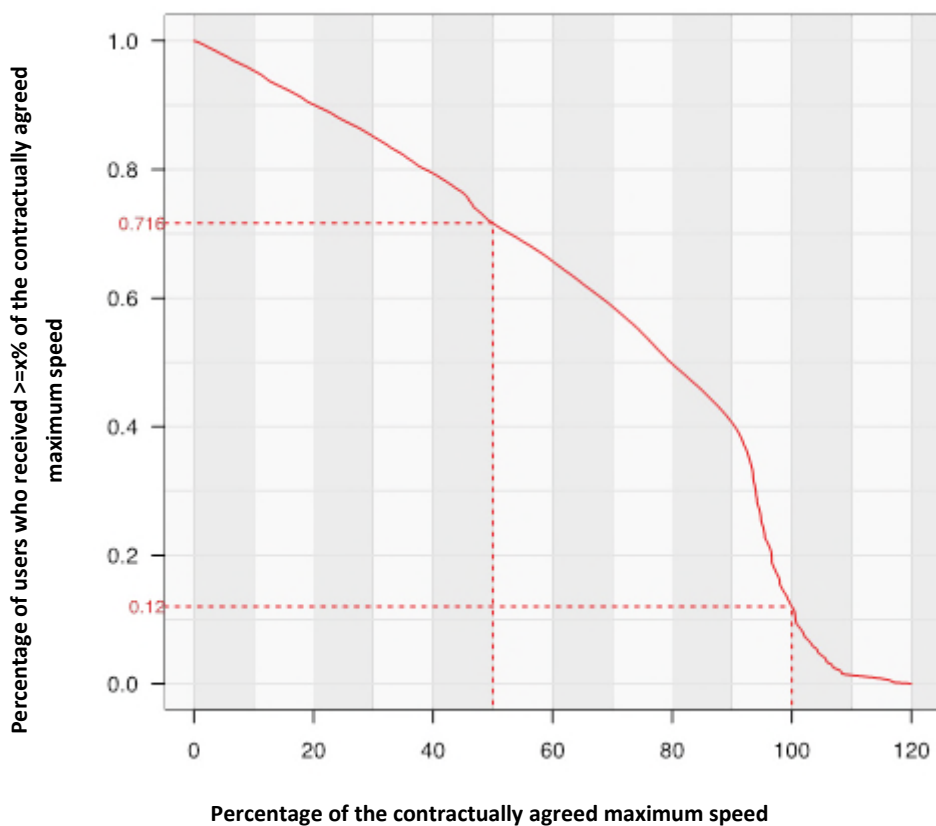
Example of the map displaying aggregate results.

76. It is important to note that the measurement sample depends on who performs the speed test as well as on the tariff agreed between him and his provider. Thus the broadband measurement test itself does not provide a basis for making statements on the level of coverage or the availability of broadband access services.
77. The measurement sample is validated in an extensive process. In particular, any possible cause of measurement errors due to the end user's environment is excluded as far as possible by using both technical and other information provided by the end user. More precisely, where end users state that measurements of fixed broadband lines have been taken in a suboptimal testing environment (in particular WLAN measurements and measurements with parallel data traffic), these measurements are excluded. Measurements made using the app also include technical data that allows the identification of measurements taken over WLAN; these measurements are also excluded.
78. Furthermore, multiple measurements taken on any fixed broadband line are excluded for statistical reasons. Only the last measurement per line and quarter is used for the report. Multiple measurements of mobile broadband connections are kept in the sample due to the fact that even a minimal change in location may generate a completely different result.

Main findings

79. The measurements covered in the second annual report were taken between 1 October 2016 and 30 September 2017. A total of 437,192 valid measurements for fixed broadband lines and 245,143 for mobile broadband connections were considered.

80. Fixed broadband lines: Some 71.6% of users across all bandwidth classes and providers recorded at least half of the maximum download data transfer rates agreed in their contracts, while for 12% of users the maximum download rates were met in full or exceeded. Compared with the previous year's period, the figures have remained more or less the same (2015/2016: 70.8% of users obtained at least half of the agreed maximum data transmission rates and 12.4% of users achieved the full rates agreed).

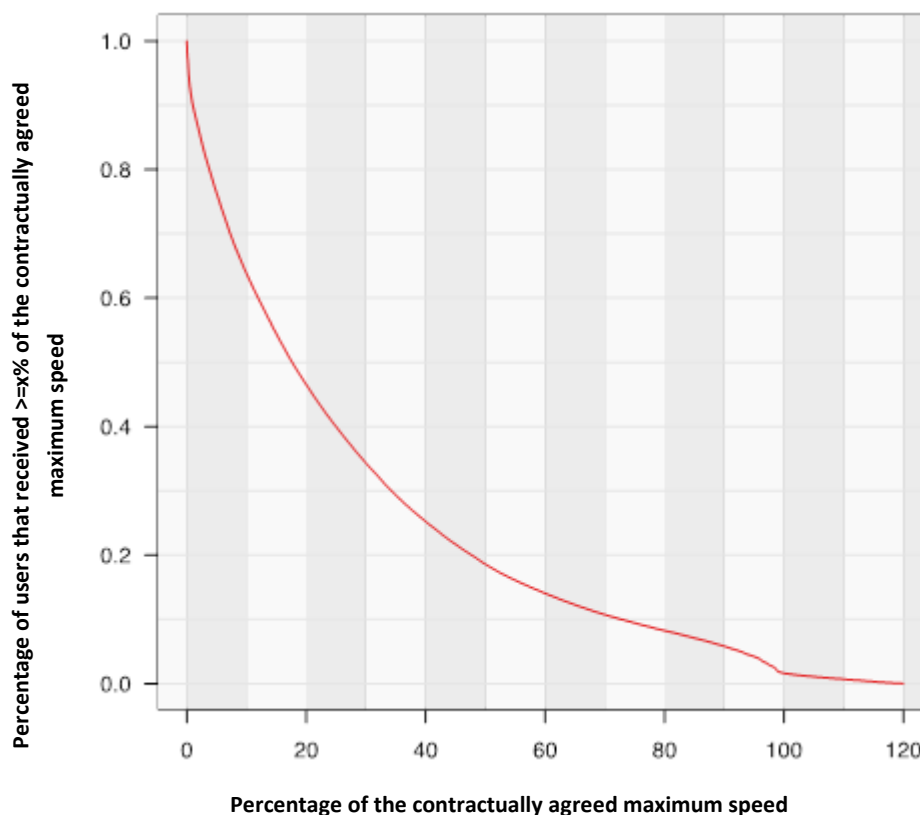


81. Thus, also the current reporting year, end users often did not receive the contractually agreed maximum data transfer rates. The results were again mixed as regards bandwidth classes, providers and the time of day. The general level (expressed as a percentage) of actual upload data transfer rates measured compared with the contractually agreed rates was again higher than the corresponding level recorded for downloads. Some 83.7% of users across all bandwidth classes and providers recorded latencies of 40ms or lower. This percentage has risen compared with the preceding annual period (2015/2016: just under 80%). Again, the lowest latencies were recorded in the top two bandwidth classes.

82. Most customers were again satisfied with the performance of their provider (rating of 1 to 3 (out of 6 with 1 being the top grade)). These customers accounted for 64.2%

(2015/2016: 65.4%). Customers were asked to rate their satisfaction prior to taking the measurement. As in the preceding annual period, it became apparent that those end users who are satisfied with their provider attained a better ratio of data transmission rates measured to contractually agreed maximum data transmission rates.

83. Mobile broadband connections: Again the results for mobile broadband connections in the present reporting period were generally much lower than for fixed broadband lines. Some 18.6% of users across all bandwidth classes and providers recorded at least half of the maximum download data transfer rates agreed in their contracts, while for 1.6% of users, the maximum download rates were met in full or exceeded. Compared with the preceding annual period, overall the percentage figures for the data transmission rates measured were considerably lower (2015/2016: 27.6% of users received at last half and 3.4% the full agreed maximum data transmission rate and more).



84. Again, the results differ with respect to bandwidth classes and providers. The level of the ratio between the measured upload data transmission rates and the contractually agreed rates was similar to the level of the ratio reached for download rates. Here, too, the percentage figure was considerably worse when compared with the previous year. Latencies over mobile broadband connections were generally higher than over fixed broadband lines. Latencies of 40ms or lower were recorded in the present reporting period for only 3.1% of mobile broadband users. In a year-on-year comparison, however, latencies in the present reporting period lay clearly below those of the preceding annual period.

85. The large majority of end users (76.6%) once again gave their providers a rating of 1 to 3 (out of 6 with 1 being the top grade). Although in comparison with the preceding annual

period, this percentage has declined (2015/2016: 82.8%). The ratio of actual data transfer rates recorded to contractually agreed maximum data transfer rates was again low for mobile broadband connections. This further suggests that mobile broadband users rate mobility and available performance over the delivery of advertised data transfer rates.

Enforcement measures

86. During the reporting period a decision was issued on the enforcement of Article 3(3). This involved prohibiting video throttling in the StreamOn zero-rating offer for some tariffs (see above paragraph 36). Some processes that were instigated in the reporting period are still pending. In other cases, providers of internet access services have voluntarily ceased infringements of the net neutrality provisions whereas in others no infringement was detected.

Report in accordance with section 43a(3) third sentence para 3 TKG

87. With respect to discrepancies in service quality especially for broadband speeds, pursuant to section 43a(3) third sentence para 3 TKG, the Bundesnetzagentur publishes an annual report on its monitoring and findings that shows the extent to which the requirements and measures under Article 5(1)(1) second sentence of Regulation (EU) 2015/2120 are necessary and effective.

88. The Bundesnetzagentur did not implement any measures with respect to Article 4(1) during the reporting period.

5. Penalties – Article 6

Article 6 Regulation (EU) 2015/2120

Member States shall lay down the rules on penalties applicable to infringements of Articles 3, 4 and 5 and shall take all measures necessary to ensure that they are implemented. The penalties provided for must be effective, proportionate and dissuasive. Member States shall notify the Commission of those rules and measures by 30 April 2016 and shall notify the Commission without delay of any subsequent amendment affecting them.

89. The third amending act to the Telecommunications Act, which entered into force on 4 July 2017, provides for administrative fines as follows for infringements of Article 3 and Article 4 in the case of
- traffic management measures that are not permitted under Article 3(3)(3) first sentence: fines of up to €500,000;
 - infringements of transparency measures pursuant to Article 4(1) first sentence: fines of up to €100,000;
 - infringement of an enforceable order of the Bundesnetzagentur: fines of up to €500,000; this may be imposed for any case of infringement of the net neutrality provisions of the Regulation (for example unlawful zero-rating offers or traffic management measures, or insufficient contractual information);
 - failure to comply with information required under Article 5 second sentence: fines of up to € 10,000;
90. Moreover, the third amending act to the Telecommunications Act provides for effective administrative fines if an internet service provider does not comply with an official order.