

RTR NET NEUTRALITY REPORT

Report in accordance with Art. 5(1) of the TSM Regulation
and Par. 182–183 of the BEREC Guidelines
on the Implementation by National Regulators
of European Net Neutrality Rules

2020

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01 Preface and executive summary

The 2020 Net Neutrality Report is the fourth report RTR has published on the openness of the internet in Austria. Based on the European Union's TSM Regulation (Regulation [EU] 2015/2120), we make regular assessments of the situation regarding the equal treatment of data transmissions over the Austrian internet.

Continuing the tradition established in previous years, the 2020 report also aims to provide the interested public with an overview of the activities and measures in which the national regulatory authority (NRA) was involved in the reporting year (1 May 2019 to 30 April 2020). Moreover, this report once again addresses general developments in the market where these are relevant for the discussion concerning aspects of net neutrality. This year's topic of interest is also the one uppermost in all our minds: the internet during the corona pandemic, including national and international factors affecting net neutrality, together with our assessment and an outlook.

In terms of day-to-day work, coordination of the enforcement of the TSM Regulation with the other EU regulatory authorities has also been a central and ongoing task. Variations in practices used to enforce this Regulation can create distortions in competition between national markets. This has serious implications for the power of the internet to innovate, since varying conditions tend to deter especially many smaller-scale content and application providers. In the reporting year, RTR therefore again sought to actively promote and shape international discussions about the enforcement of the TSM Regulation. Making the most of this opportunity, we also made an in-depth contribution to the BEREC Guidelines review. This review will also be published in June 2020.

Our international work also has implications for our national activities. Here we have maintained our previous approach of constructive dialogue with the market. This approach is also guided by the idea that, even in a dispute, a legally compliant solution should be pursued that involves all stakeholders. As in the past, an official decision ordering compliance should be a measure of last resort and only applied in cases where mutual agreement could not be reached with the ISPs concerned. In all of our regulatory activities, however, we also believe that it is necessary to make a clear commitment to facilitating a level playing field for all ISPs and end users. We therefore remain true to this commitment by meeting actual net neutrality infringements with the full force of the law.

Processing new request-for-information procedures has also been part of our operational business since the last report. Back in 2018, twelve ISPs were selected and asked to complete questionnaires that would provide us with information about products and technical practices. The answers from these ISPs are now available. Most ISPs were also happy to cooperate without the need for a formal supervisory procedure. As of the end of May 2020, only one response was outstanding: this case involves a longer implementation period for technical changes aimed at bringing about a state of compliance with the TSM Regulation. Essentially, therefore, it was possible to complete all procedures with satisfactory outcomes. In terms of substance, the acknowledged

violations of the TSM Regulation in all cases primarily involved the non-assignment of public IP addresses, port blocking and the forced disconnection of IP connections. In general terms, the state of knowledge about these issues and the readiness to cooperate on the part of affected companies can be described as very positive.

Alongside the non-specific monitoring of potential breaches of net neutrality on our part, another focus involved the clarification of issues involving website blocking due to copyright claims. A total of eight supervisory procedures were initiated here, of which six have been brought to a close to date. As requested by a number of internet access service providers, the Telekom-Control-Kommission (TKK) conducted a total of seven assessment procedures in the same period. One of these procedures was concluded by the withdrawal of the request in its entirety. For the remaining six, the TKK ruled that an access block to the website being examined in the procedure was not admissible in the absence of an injunction claim based on copyright and that such a block would breach the provisions of the TSM Regulation. One party to the dispute petitioned the Federal Administrative Court (BVwG) to review the decisions issued in these procedures. The basic thrust of this procedure addressed the tension between a legitimate interest in protection under copyright law, and the core principles of free and unrestricted internet access.

As mentioned at the outset, the primary focus of this year's Net Neutrality Report is the role of the free internet in the context of the measures adopted to stem the as-yet ongoing pandemic. Working from home for businesses and learning online for students and pupils, along with more free time but less space in which to spend it, all worked to change in many ways how we use the internet as compared with what we were previously accustomed to. While the use of voice services rose in the first few weeks to around three times pre-lockdown levels, with a corresponding increase in data consumption, it also soon became clear that there would be no need to activate the emergency measures envisaged in the TSM Regulation for such a situation. Alongside the good communication strategies adopted by the ISPs, this state of affairs is largely thanks to their prompt reaction to changes in their customers' internet usage during the corona crisis and the creation of extra capacity to meet this demand at short notice. While this also showed that we currently have the capacity in our networks to handle such events, it also substantiates our belief that we need to plan properly for the future by ensuring further expansion of our infrastructure.

In summary, this year's report can once again attest a continued overall positive picture for the state of the open internet in Austria. Where there was a real risk of a breach, affected companies generally cooperated in finding a constructive solution: these solutions were agreed with the TKK and then implemented or are currently being implemented. In some cases, an initial suspicion was followed by the submission of plausible justifications or investigations that revealed blocks had not been imposed unreasonably; these cases were then dropped.

Section 1

Preface and executive summary

The BVwG also reversed a decision issued by the TKK. Details of this case follow below.

Looking to the future, we have decided to pursue our monitoring activities further, so as to continue to ensure competition is as fair as possible in Austria. The procedures and discussions that make up our coordination and communication activities with regulatory authorities and market participants will also remain an important part of our work. In detail, these include additional request-for-information procedures, the ongoing auditing of ISP terms and conditions of business, the use of data provided by ongoing market monitoring (based on sources including the KEV, RTR-NetTest and customer information), empirical surveys and analyses of platforms and digital gatekeepers, as well as the continuous and ongoing consultations with ISPs and other stakeholders (relating to issues such as questions of copyright law, 5G, new types of internet products and the EU Digital Services Act). We will also continue to play an active part in discussions of net neutrality at EU level and will work to ensure that it is enforced as uniformly as possible. This is ultimately to everyone's benefit.

Vienna
June 2020

Dr. Klaus M. Steinmaurer

Managing Director
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RTR

02 Introduction: stakeholders and institutions in enforcement

In terms of content, this fourth edition of the Net Neutrality Report published by the Austrian Regulatory Authority for Broadcasting and Telecommunications (RTR) mirrors the structure of last year's report in presenting a separate section as a 'focus topic' in which a key aspect of net neutrality – this year, the internet in the context of the corona crisis – is analysed in greater depth and detail.

Providing a straightforward definition of the term net neutrality is not an easy matter. Essentially, the term refers to the equal treatment of transmitted data, regardless of sender, recipient or chosen application. This report addresses questions such as: How open is the internet in Austria? Which measures had to be adopted by regulators in the reporting year (1 May 2019 to 30 April 2020, inclusive) to ensure the openness of the internet – which is and has been the driver for so many innovations we can now scarcely do without? What are the new product developments that, while potentially offering advantages for consumers, at the same time potentially harbour risks for the future sustainability of the internet? Pursuing this line of enquiry, the report aims to inform readers both about the state of play and about how and when regulators act in the interests of net neutrality.

As in the past, internet service providers (ISPs) continue to be the primary target audience for net neutrality provisions. The main concern of the EU Regulation is to keep pace with changing technical capabilities (for traffic identification and control) and support the potential new business models (or practices) pursued by ISPs without allowing them to limit the innovative power of the internet. The TSM Regulation accordingly identifies business practices, technical measures and obligations (such as ensuring transparency for end users) that are required or prohibited in order to uphold net neutrality. Alongside ISPs, the Regulation both empowers and addresses end users in particular (private citizens and businesses), and providers of content, services or applications (CAPs).

In Austria, the Telekom-Control-Kommission (TKK) and Austrian Regulatory Authority for Broadcasting and Telecommunications (RTR) are responsible for enforcing the TSM Regulation. This is now explicitly included as part of the December 2018 amendment to the Telecommunications Act. Supervisory procedures under Art. 5(1) of the TSM Regulation continue to be part of the TKK's remit, while the upstream request-for-information procedures pursuant to Art. 5(2) of the TSM Regulation are completed by RTR. Another aspect is the continued requirement for general terms of business and fee provisions, and any amendments to them, to be notified to RTR before commencement of the service, as set out in Art. 25 of TKG 2003. This requirement relates among other things to net neutrality. The TKK can issue an objection within eight weeks in the event of failure to comply with the TKG 2003 or ordinances issued on the basis of the TKG 2003, or with Articles 879 and 864a of the Austrian General Civil Code (ABGB), Articles 6 and 9 of the Austrian Consumer Protection Act (KSchG), or Art. 4 of the TSM Regulation. All relevant changes in contract conditions (including those that affect net neutrality) must be submitted to the regulatory authority. These changes are reviewed for compliance with the minimum contractual content given in Art. 4(1) of the TSM Regulation. This gives the regulatory authority an efficient 'early warning' mechanism – even though violations of provisions other than those stated in Art. 4(1) of the TSM Regulation can only be prohibited *ex post*. Moreover, the regulatory authority can also impose reporting requirements on a company, which can help to improve estimates of the impact on the market.

RTR is a convergent telecoms, postal and media organisation, and its Telecommunications and Postal Services Division and Media Division consult both with one another as well as with the TKK and the Austrian Communications Authority (KommAustria) on all key issues relating to net neutrality. One reason why this is essential is the fact that many net neutrality topics (such as zero-rating or specialised services) exhibit an overlap with media topics (such as the procedure addressed in section 4.6). Points of contact also exist with the Austrian Data Protection Authority.

The present report stems from an obligation imposed on the European national regulatory authorities (NRAs) by the Telecoms Single Market Regulation (TSM Regulation)¹. One aim of this obligation is to achieve an approach to the application of the provisions of net neutrality that is as consistent as possible.

This report also duly complies with the guidelines² published by the Body of European Regulators for Electronic Communications (BEREC)³, which also include a section on reporting duties (Par. 182–183). Nonetheless, in the interests of clarity and readability, this report deviates in some respects from the section structure recommended by the guidelines. Interested readers can compare the structure of this report with the structure proposed by the guidelines by consulting the dedicated mapping presented in Appendix 1.

The current reporting year was notable for the following events, publications and activities. Firstly, a series of procedures investigating network blocks were conducted. As noted at the outset, this topic involves negotiating the tensions created between the protections granted under copyright law and the provisions of the TSM Regulation, with the express aim of enabling open access to the internet. Particularly worthy of mention here is a dispute concerning the question of whether the internet service provider (ISP) is entitled to have the legality of a specific network block ascertained by the regulatory authority before the block actually takes effect. Although the regulatory authority views its competence in this matter as assured, even in the absence of an explicit national procedural standard, this is not the legal opinion of the Federal Administrative Court (BVwG). Divergent answers have also been given by the regulatory authority and the BVwG to the question of when a DNS block must be removed because incriminating online content is not available under a specific domain. Both of these legal questions were referred to the Supreme Administrative Court for final judgment towards the end of the reporting period.

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. L 310/1 of 26 November 2015, https://www.rtr.at/de/tk/tsm_regulation/TSM-en.pdf

² BEREC Guidelines on the Implementation by National Regulators of European Net Neutrality Rules, August 2016, BoR (16) 127, https://www.rtr.at/en/tk/nn_berec_guidelines; the revised Guidelines were published on 16 June 2020: BEREC Guidelines on the Implementation of the Open Internet Regulation, June 2020, BoR (20) 112, https://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/guidelines/9277-berec-guidelines-on-the-implementation-of-the-open-internet-regulation

³ BEREC is the association of independent EU regulatory authorities.

A second point of focus was once again the NRA's international activity. To be effective, a framework of rules relating to internet-driven innovation should not be created and enforced at national level but established instead on as broad a basis as possible. Correspondingly, the TSM Regulation is an EU Regulation with direct relevance for the Member States of the European Union. As independent approaches taken by individual countries or regulatory authorities could ultimately disadvantage some ISPs or CAPs vis-à-vis other ISPs/CAPs in other Member States, a uniform set of practices should ideally be pursued wherever possible.

In this context, it should be remembered that the European Commission (EC) published its report reviewing the TSM Regulation⁴ on the last day of the last reporting period. In the report, the EC praised the TSM Regulation and its enforcement in Member States, and identified no areas requiring amendments (not even relating to 5G). The EC's only admonition was to continue vigilant monitoring.

As a consequence of and direct response to the EC's report, the reporting year also saw the publication of two consultations from BEREC, with the purpose of revising the Guidelines accompanying the TSM Regulation. The RTR was closely involved with this revision – as it had been in the creation of the initial Guidelines. The key points of focus here included: zero-rating and an assessment methodology for zero-rating (Art. 3(2) + Annex), traffic management (Art. 3(3) + Art. 3(2)), specialised services (Art. 3(5)), transparency requirements (Art. 4) and the monitoring of specific content. The final Guidelines, which aim to secure uniform enforcement over the next few years, were adopted by the BEREC plenary assembly in June 2020.

A third key point of focus for activities was the situation caused by the coronavirus pandemic. This has not only thrown our society's fundamental dependency on internet usage into sharp focus but also raised a whole series of questions about network congestion, monitoring and the equal treatment of various types of traffic, prioritisation, and so on. In recognition of this topic's special relevance and the exceptional circumstances it has created – which still apply as of this writing – the corona crisis is this year's focus topic for internet usage.

In the work it conducts with ISPs, the regulatory authority continues to uphold the principle of identifying breaches of the TSM Regulation (monitoring) while raising awareness for the topic among ISPs, so as to ultimately create a stable environment for entrepreneurial activity and innovation. Where breaches of net neutrality rules are found, the authority envisages appropriate transition periods for their resolution – which also permit companies to adjust to the new legal standards without experiencing disruptive interventions.

Furthermore, net neutrality is a topic that must always be approached with an eye to current practice: increasingly, questions are now arising about the implementation of net neutrality concepts in the context of the fifth-generation mobile network standard (5G). Other questions address resource distribution across network layers (network slicing) and their classification within the scope of the TSM Regulation, and the admissibility of traffic detection measures for zero-rating in relation to the strict data protection laws now in existence.

⁴ EC 2019: REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the implementation of the open internet access provisions of Regulation (EU) 2015/2120, COM(2019) 203 final, <https://ec.europa.eu/transparency/regdoc/rep/1/2019/EN/COM-2019-203-F1-EN-MAIN-PART-1.PDF>

Section 3 presents the reader with a chronological overview of the national regulatory authority's activities, while (suspected) breaches of net neutrality are presented in section 4. Section 5 takes a look at other monitoring systems in relation to net neutrality and provides a set of key figures that describe the development of the internet in Austria. Section 6 is dedicated to this year's focus topic: internet and the corona crisis. The last part of the report, section 7, presents a brief summary of the projects and challenges expected in the next reporting year.

03 Timeline of regulatory authority activities

FIGURE 1: TIMELINE OF EVENTS IN THE REPORTING PERIOD



Source: RTR

Figure 1 shows the chronological sequence of relevant events in the reporting period (May 2019–April 2020). The table below gives an overview of these events, with a brief description as well as some historical context. Further details about these procedures can be found in section 4.

TABLE 1: TIMELINE OF EVENTS IN THE REPORTING PERIOD

WORK IN EU BODIES		
1	Current	Participation in the BEREC working group on the open internet/net neutrality Topics in 2019: Update to the Guidelines on Net Neutrality, Report on the implementation of Regulation (EU) 2015/2120 and BEREC Net Neutrality Guidelines, Carry-over work on BEREC Net Neutrality measurement tool Topics in 2020: Carry-over work on the update to the Guidelines on the Implementation of the Open Internet Regulation, Implementation of Regulation (EU) 2015/2120 and the BEREC Guidelines on the Implementation of the Open Internet Regulation, NRA deployment support and sharing practical experience with the Net Neutrality measurement tool

		NATIONAL STATUS QUO ANALYSIS/DISCUSSION WITH ISPS
2	Current	Discussions with operators on the topic of net neutrality
		ENFORCEMENT OF TSM REGULATION
3	Dec. 2017– Apr. 2020	One of the discontinuation procedures initiated by the TKK against the five largest providers was heard before the BVwG. A decision on this case was handed down in April 2020 (section 4.6).
4	Feb 2019– Apr. 2020	Continuation by RTR of the request-for-information procedures initiated previously by the TKK against eleven ISPs. While most procedures were dropped by January 2020, the implementation deadline (until 2022) for one is still open (for further details, see section 4).
5	Apr. 2019– March 2020	The TKK conducted eight supervisory procedures on the topic of website blocks (copyright law) according to Art. 5 of the TSM Regulation. The procedure concerned the legitimacy of blocking access to certain websites as a result of injunction claims based on copyright (see section 4 for further details).
6	Apr. 2019– Apr. 2020	The TKK conducts seven supervisory procedures on the topic of website blocks (copyright law) based on Art. 5 of the TSM Regulation. The procedure concerned the legitimacy of blocking access to certain websites as a result of injunction claims based on copyright (see section 4 for further details).
7	July 2019	The TKK issues a decision against T-Mobile Austria GmbH relating to the admissibility of access blocks for certain websites as a result of injunction claims based on copyright (for further details, see section 4).
8	Aug. 2019	The TKK issues assessment decisions as requested by A1 Telekom Austria AG, Salzburg AG für Energie, Verkehr und Telekommunikation, T Mobile Austria GmbH, Hutchison Drei Austria GmbH, Multikom Austria Telekom GmbH and Telematica Internet Service Provider GmbH relating to the admissibility of access blocks for certain websites as a result of injunction claims based on copyright (section 4).
9	since Aug. 2019	Ongoing TKK procedure from its 2018 request-for-information procedures according to Art. 5(1) of the TSM Regulation (for further details, see section 4).
10	Oct 2019	The TKK issues a decision against A1 Telekom Austria AG relating to the admissibility of access blocks for certain websites as a result of injunction claims based on copyright (for further details, see section 4).
11	since Dec. 2019	Ongoing TKK procedure on the subject of website blocks (copyright law) according to Art. 5 of the TSM Regulation. The procedure concerned the legitimacy of blocking access to certain websites as a result of injunction claims based on copyright (see section 4 for further details).
12	Feb. 2020	Rulings handed down by the BVwG declare petitions made by various UPC companies to review TKK decisions on G 174, 175, 176, 188/16 as null and void due to the lack of legal grounds for such a petition, except for those by UPC Telekabel-Fernsehnnetz Region Baden Betriebsgesellschaft m.b.H., which is now merged with T-Mobile Austria GmbH.
13	Feb. 2020	BVwG issues a ruling as a result of a petition to review the assessment decision for S 6/19 (for further details, see section 4).
14	March 2020	BVwG issues rulings as a result of petitions to review the assessment decisions for S 5, 7, 10/19 (for further details, see section 4).
15	March 2020	The TKK issues decisions against Hutchison Drei Austria GmbH, kabelplus GmbH, T-Mobile Austria GmbH and LIWEST Kabelmedien GmbH relating to the admissibility of access blocks for certain websites as a result of injunction claims based on copyright (for further details, see section 4).
16	April 2020	BVwG issues a ruling as a result of a petition to review the assessment decision for S 6/19 (for further details, see section 4).

04 Potential violations of net neutrality

and associated procedures

On the entry into force of the TSM Regulation, the regulatory authority promptly began audits of products already offered on the market, and the technical and commercial practices adopted by ISPs. Of the resulting procedures to be completed with the issuing of a decision, one procedure⁵ had been decided (by the BVwG) on 30 April 2020 (for details, see 4.6). Another procedure has been pending at the BVwG since December 2017.⁶

As in previous reporting periods, the work of the regulatory authority focused on auditing the products and the technical/commercial practices adopted by ISPs, first notifying the latter of any potential breaches identified and consulting with them to identify legally compliant solutions.

As already stated in the 2019 report, the procedures completed in the reporting period were able to identify technical and commercial practices that were problematic in light of the provisions of Art. 3 and therefore needed to be investigated.

⁵ BVwG 30 April 2020, W120 2183616-1/29E.

⁶ RTR 2017: R 5/17, https://www.rtr.at/en/tk/R5_17_Bescheid_18122017

TABLE 2: SUMMARY OF PROBLEMATIC PRACTICES IN LIGHT OF THE TSM REGULATION

	TYPE OF PRACTICE	DESCRIPTION
1.	Port blocking	Certain UDP or TCP ports are blocked for incoming and/or outgoing traffic. This may render certain services unusable, which is a contravention of Art. 3(1) and Art. 3(3) of the TSM Regulation. A more detailed description is given in section 4.1.
2.	Private IP addresses and services	Customers are assigned private IP addresses, via network address translation (NAT). This prevents these customers from using or providing their own services; this right follows, however, from Art. 3(1) of the TSM Regulation. A more detailed description is given in section 4.2.
3.	Zero-rating	The data volume used by a specific application or for a specific CAP does not count towards the data volume cap included in the customer's subscription. A more detailed description is given in section 4.9.
4.	Specialised services	A specialised service is a service that is not offered by the ISP via normal internet access service (IAS) but instead as a prioritised/optimised service. To be offered as a specialised service as defined by Art. 3(5) of the TSM Regulation, a service must first satisfy certain conditions.
5.	Technical discrimination and restriction of internet access	Traffic modification/redirection or the placing of restrictions on the IAS contravenes Art. 3(3) of the TSM Regulation.
6.	Disconnection of IP connections	Automated disconnection of IP connections restricts the rights of the end user to use or provide their own services (Art. 3(1) TSM Regulation). A more detailed description is given in section 4.3.
7.	Blocking websites due to copyright claims	Even though jurisdiction for ruling on injunction claims based on copyright normally lies with the ordinary courts, the specific traffic management measures (blocks) used to implement such orders must be verified to ensure compliance with the TSM Regulation. Where such traffic management measures are implemented simply because the ISP has been asked to do so by copyright holders (and not as a result of a court order), it is also necessary verify whether an exception exists under point (a) of Art. 3(3) third subparagraph TSM Regulation (see section 4.4).

In a continuation of earlier work aimed at monitoring compliance with the TSM Regulation, many smaller-scale fixed and mobile operators were audited. A total of twelve ISPs were selected, to whom questionnaires requesting information about products and technical practices were sent. Some of these procedures were initiated shortly before the start of the new period under review. Corresponding answers from the ISPs are available for all of these procedures. The continuing readiness to cooperate on the part of many ISPs without the need for a formal supervisory procedure is once again to be welcomed. As a result, only one of these procedures was pending at the end of the reporting period. For this procedure, a longer implementation period applies for technical changes aimed at ensuring compliance with the TSM Regulation. All other request-for-information procedures had been dropped, although two only after submitting them to the TTK for initiation of a supervisory procedure.

In all procedures, the focus of TSM Regulation violations was primarily on the non-assignment of public IP addresses, port blocking and the forced disconnection of IP connections. By the end of the reporting period, six ISPs (one MVNO had formed separate companies for its separate brand identities, which led to four separate procedures), following notification of the relevant deficiencies, had taken corrective action (port blocks had been lifted, public IP addresses would be assigned in the future etc.). One MVNO required a longer period of time to make the necessary changes and this extension was granted.

The two procedures that had been referred to the TKK for the initiation of a supervisory procedure according to Art. 5(1) of the TSM Regulation largely concerned a refusal to assign public IP addresses to end users on the part of these two MVNOs, both operating in the low-end segment. While the two MVNOs sought in the request-for-information procedures to contest their obligation to assign public IP addresses, this was abandoned after the initiation of the supervisory procedures. Both MVNOs stated they would be willing to assign (dedicated) public IP addresses to end users on request in the future.

One MVNO was acquired in the interim by a mobile network operator (MNO) and its network transferred to this MNO's (already audited) network: this changeover/adjustment had the effect of resolving any potential breaches. This procedure merely required awaiting the end of the changeover period. The implementation of the measures is still to be verified.

In this reporting year, the regulatory authority again addressed issues involving the handling of blocks placed on domains as a result of claims made by copyright holders because the sites operated using these domains/IP addresses were structurally in breach of copyright law. Much of the detailed work in net neutrality during the reporting year focused on these kinds of scenarios. Specifically, this involves verifying compliance with point (a) of Art. 3(3) third subparagraph TSM Regulation concerning the blocking of content (websites) in response to copyright claims, or the applicability of provisions granting exceptions. Even though courts of law are authorised to issue such copyright injunctions, the specific traffic management measures (blocks) used to implement such orders must be verified to ensure compliance with the TSM Regulation. Where such traffic management measures are implemented simply because the ISP has been asked to do so by copyright holders (and not as a result of a court order), it is also necessary to verify whether an exception based on point (a) under the third subparagraph of Art. 3(3) of the TSM Regulation exists. Whether the copyright holder has a valid claim is a preliminary issue in this evaluation. A detailed description of these activities is provided in section 4.4.

Alongside activities previously described as part of the stated procedures concerning existing products, general terms of business and fee provisions were also reviewed for compliance with the TSM Regulation pursuant to the authority's statutory role in reviewing contract terms (Art. 25 Par. 6 TKG 2003). With respect to the minimum content requirement set out in Art. 4(1) of the TSM Regulation, no immediate steps in formal procedures, based on the TSM Regulation, needed to be taken in the reporting period: inclusion of this content is meanwhile common practice.

4.1 Blocking of TCP/UDP ports or protocols

Request-for-information procedures conducted in 2019 revealed that some of the providers surveyed block various ports in the TCP and UDP protocols, typically citing as a reason the need to maintain network security and integrity (based on point (b) of Art. 3(3) third subparagraph). This is problematic, since it could restrict end-user rights pursuant to Art. 3(3) third subparagraph.

In terms of port blocking, varying sets of circumstances have arisen as a result of these new procedures. In most cases, the technical reasons for blocking specific ports were clarified in the ongoing procedures. Since the mobile ISPs involved in the procedures are all virtual network operators (MVNOs), most without their own core networks, these operators simply referred the matter to their host operators. Since these MNOs had already been audited in the first round of procedures, no further investigations were necessary. Results from the providers of fixed network internet access service (IAS) surveyed were again varied and port blocking strongly depended on factors necessitated by hardware. As an example, one provider of IAS was using TCP port 22 (service: secure shell, SSH) for the maintenance of a part in its modem and had therefore placed an end-user block on the port. In some cases, this kind of block was actually present for 'historical' reasons.

At this juncture, it must once again be stated that an assessment of the legitimacy of port blocking activities always requires a case-by-case approach. Accordingly, the fact that one procedure has considered a port block in a specific scenario to be legitimate cannot automatically be used to conclude the legitimacy of port blocking as practised by other providers of IAS.

The following section offers a summary of selected case histories.

Port 22 (SSH)

One fixed network operator blocks this port for use by specific internet access technologies for technical reasons based on their network topology (CPE maintenance). The ISP honoured its commitment to replace the affected modem, which meant the block could be lifted.

TCP port 23 (Telnet)

One mobile operator confirms blocking incoming traffic on TCP port 23. This action was justified by citing vulnerabilities in the hardware used by end users. The block was removed after replacing this hardware.

TCP port 25 (SMTP)

One mobile network operator and several fixed network operators stated that they block outgoing traffic on port 25. The key reason for such a block is to prevent a customer's computer from sending spam mail after becoming infected by malware. If the provider only assigns private IP addresses (via NAT) and a public IP address that is shared by many customers via NAT is blacklisted, all email from those customers could be blocked.

When assessed pursuant to point (b) of Art. 3(3) third subparagraph, these blocks are considered to be legitimate – as they have been in previous procedures – since (pure) SMTP is a protocol frequently misused at retail level (for sending spam).

TCP/UDP port 53 incoming (DNS)

Three ISPs stated that this block was deployed to avoid the risks of DNS amplification attacks and DNS spoofing. Two ISPs stated that these blocks were limited to end users with dynamic IPs.

TCP ports 67–69 bidirectional (DHCP, BOOTPS, TFTP)

One fixed network operator blocks this port for use by specific internet access technologies for technical reasons based on their network topology (CPE maintenance).

After a lengthy analysis, the block was considered legitimate pursuant to point (b) of Art. 3(3) third subparagraph in the absence of a less intrusive solution and since the TFTP protocol now has hardly any practical relevance for end users in terms of internet access.

TCP ports 137–139 bidirectional (NetBIOS)

One fixed network operator blocks this port range, arguing that within a WAN there is no use case for the Windows file and printer sharing services, which require these ports in order to function. Simultaneously, opening these ports would also expose customers to considerable risk, since they are not experienced in handling these services. In the event of a customer misconfiguration, there would be a risk of unauthorised parties gaining access to their network shares.

Following an analysis based on point (b) of Art. 3(3) third subparagraph, these blocks were considered legitimate for incoming traffic.

TCP port 443 incoming (HTTPS)

One fixed network operator confirmed blocking incoming traffic on TCP port 443. Lifting this block became possible after a migration to new hardware.

TCP port 445 incoming (SMB)

One fixed network operator blocks this port for incoming traffic on account of security concerns in relation to end users. In the case of the remaining fixed network operator, following an analysis based on point (b) of Art. 3(3) third subparagraph, these blocks were considered legitimate for incoming traffic.

TCP port 455 incoming (CreativePartnr)

One fixed network operator stated that this TCP port was blocked for maintenance reasons. The block has since been removed or is activated only in the event of maintenance.

TCP ports 10001, 10021, 10080 and 10081

One fixed network operator confirmed blocking these TCP ports for maintenance reasons. As this affected only a few modems and the ports are not in the 'common port' range, this block was considered to be justified based on point (b) of Art. 3(3) third subparagraph.

TCP port 8089

One MVNO requested an extension until early 2022 to allow time to replace affected hardware that sets up CPE maintenance connections via this port. This extension was granted due to the scope of replacement work.

4.2 Private IP addresses and services

Art. 3(1) grants end users also the right to use or provide their own services. These services range from smart home servers set up for personal use (e.g. temperature monitoring) on appropriate hardware, to web servers operated by end users for third parties.

A key technical prerequisite for the self-hosting of services is therefore the direct accessibility of the server or service operated by the end user from the internet, and therefore the assignment of a public IP address to this user's internet connection.

In mobile networks in particular, customers are occasionally assigned private IP addresses (via NAT). Apart from technical aspects, reasons for this include ISPs' interest in keeping public addresses in reserve, since – as with IPv4 – these could become scarce.⁷ However, if multiple customers are required to share a single private IP address via NAT, this effectively prohibits any individual customer from providing services or content themselves. The regulatory authority interprets Art. 3(1) as entitling the end user to at least one free public dynamic IP address – at least if the end user requests such an address, for example because of wishing to offer services. The end user can then utilise that address with dynamic DNS services to allow routing to their own services. Assigning a public IP address on condition of payment of an additional fee (defined for instance in a specific subscription model or as an added option) or only to certain customer segments (such as business customers) is in any case to be considered a breach of Art. 3(1).

The last reporting period had shown that this problem is especially common with mobile network operators, and especially with MVNOs. On request, the above-mentioned fixed network operator stated that currently only private IPv4 addresses (carrier-grade NAT) and public IPv6 addresses were being assigned to end users. While the (additional) allocation of IPv6 addresses is to be welcomed, IPv6 penetration across the entire internet is currently only about 25 per cent. On expiry of the deadline, the fixed network operator confirmed that it would now also be assigning public IPv4 addresses.

After making a number of technical modifications, an MVNO group (consisting of several individual companies) was ultimately able to acquire a volume of IPv4 addresses large enough to be able to provide these to end users on request.

Problems in this area will continue to occupy the regulatory authority's attention in future.

⁷ While fewer than 2³² (approx. 4 billion) addresses are available using IPv4 and are now becoming scarce, IPv6 provides a little under 2⁶⁴ (approx. 18 trillion) subnets and therefore easily enough for the foreseeable future.

4.3 Disconnection of IP connections

Another practice limiting the right of end users to self-host services is the automatic disconnection of internet connections (IP connections) typically after a short period of time.

It was common for some ISPs to disconnect their customers' data connections (IP connections) automatically after a certain period of time (usually 24 hours). No heed was given here to existing internet connections, in other words, the connection was always disconnected after this period, not only when it was idle. The reasons given here by the ISPs ranged from technical considerations regarding the assignment of IP addresses to the protection effects claimed for the benefit of user privacy. This measure is a problem mainly because dynamic public IP addresses are reassigned – even when user devices are automatically reconnected. It can take from several minutes up to half an hour until a dynamic DNS service in use recognises the change in IP address and updates the clients. The frequency of the terminations ultimately means this constitutes a disproportionate restriction of the right of the end user under Art. 3(1) of the TSM Regulation.

This circumstance also played a role in the current reporting period, although it occasionally gave rise to misunderstandings among MVNOs surveyed in the period under review. In the context of Art. 3(1), rights are considered restricted only when the IP connection is actually interrupted but not when the session is terminated for billing purposes. The latter typically does not lead to an interruption of the end user's connectivity, nor does the IP address allocated to the user change.

After talks with affected ISPs (except for the MVNO that ceased operations in March 2019 and the other MVNO acquired by an MNO), it was discovered that these cases do not in fact involve a wilful disconnection of IP connections but merely the completion of 'session tickets' for the purposes of account settlement.

4.4 Blocking websites due to copyright claims

In principle, ISPs may not block, throttle, change, restrict, disrupt, impair or discriminate specific content, applications, services or categories of the same, subject to the exceptions set forth in the TSM Regulation. Thus, the listed measures can be taken insofar and for as long as they are necessary to comply with EU legislative acts or national laws or related implementing measures.

There is a special copyright provision in Art. 81 Par. 1a of the Copyright Act (UrhG) according to which ISPs can also be obliged to block access to websites that structurally breach the law, if they have previously been duly warned by a rights holder. A website in 'structural breach' of the law is a website that infringes exclusive rights as defined in the UrhG not only in isolated cases but systematically and regularly instead. One example of this is when website operators contribute to the mass distribution of illegal copies of copyrighted works by providing an indexed BitTorrent file to allow users to more easily locate titles of works they are looking for.⁸

⁸ OGH 24 October 2017, 4 Ob 121/17y; TKK 28 November 2018, R 1-5, 8, 9/18; 12 April 2018, R 1-6/19; 9 July 2019, R 7/19; 22 October 2019, R 8/19; 19 August 2019, S 1-5, 8, 10, 13/19; 17 March 2020, R 11-14/19.

Before awarding to a rights holder an injunction against the ISP, various basic rights first need to be considered.⁹ In assessing claims based on Art. 81 Par. 1a UrhG, the entitlement to protection of intellectual property claimed by the copyright holder requesting the injunction, as well as that party's right to effective enforcement of the law, must be weighed against the basic rights to freedom of expression, freedom of information and freedom to conduct a business, to which internet users, website operators and the access provider involved in the procedure are entitled.¹⁰ Since consideration of those basic rights is intrinsic to the assessment of claims based on Art. 81 Par. 1a UrhG, this provision is therefore an exception as referred to in Art. 3(3) third subparagraph point (a) of the TSM Regulation.¹¹ If an ISP adopts a proportionate traffic management strategy that accords with these claims, this does not violate the terms of the TSM Regulation.

Website blocking in the reporting period

In the period between early 2019 and April 2020, the TKK initiated a total of eight supervisory procedures against ISPs who were suspected of having denied access to particular websites, and completed six procedures in this period. In the procedures, the providers claimed to have denied access to some of these websites in response to a court decision – such as a provisional injunction or a court ruling. They also said that most blocks had been placed solely in response to warnings issued by the rights holders. Even though jurisdiction for ruling on injunction claims based on copyright normally lies with the ordinary courts, the regulatory authority is responsible for verifying the traffic management measures to determine whether the specific implementation in the form of access-blocking is compatible with the TSM Regulation. If traffic management measures of this kind are taken by providers of internet access services after a warning by rights holders but without a corresponding court ruling, the exception pursuant to Art. 3(3) third subparagraph (a) TSM Regulation must also be verified. In 13 of the supervisory procedures named, the procedure was concluded with a decision that provided a detailed assessment of the topic while considering the rulings of the Austrian Supreme Court (OGH) and the ECJ available when the particular decision was taken.

In summary, it can be said that blocks as a result of a legally enforceable court judgement concerning a claim pursuant to Art. 81 Par. 1a UrhG are binding on the national regulatory authority within the legal limits of the court's decision and that the decision in the supervisory procedure must be based on this court decision. If no decision binding on the TKK has been issued by the competent court against the affected provider of internet access services, then the actual existence of this claim under copyright law must be adjudged as preliminary in the context of the procedure pursuant to Art. 5 of the TSM Regulation.

In the 6 procedures completed¹², the placing of access blocks to the websites that were the subject of the procedures was in accordance with the legitimate rights of the rights holder pursuant to Art. 81 Par. 1a UrhG. Additionally, the traffic management measures adopted, typically by setting up DNS blocks, were appropriate to the situation and observed the principle of proportionality.

⁹ ECJ 27 March 2014, C-314/12, UPC Telekabel Wien/Constantin Film Verleih et al.

¹⁰ OGH 14 October 2017, 4 Ob 121/17y.

¹¹ TKK 28 November 2018, R 1-5, 8, 9/18; 12 April 2018, R 1-6/19; 9 July 2019, R 7/19; 22 October 2019, R 8/19; 19 August 2019, S 1-5, 8, 10, 13/19; 17 March 2020, R 11-14/19.

¹² TKK 9 July 2019, R 7/19; 22 October 2019 R 8/19; 17 March 2020 R 11-14/19.

As requested by a number of ISPs, the TTK initiated seven assessment procedures in the period from early 2019 to April 2020. Unlike the supervisory procedures pursuant to Art. 5 of the TSM Regulation as described above, the supervisory procedure here deals with websites that have not yet been blocked. An assessment procedure must determine whether an exception exists within the meaning of point (a) of Art. 3(3) third subparagraph of the TSM Regulation and whether it would be legitimate to subsequently block the website.

One procedure was concluded by the complete withdrawal of the request on the part of the applicant parties in the procedure. For the remaining six, the TTK ruled that an access block to the website being examined in the procedure would not be admissible in the absence of an injunction claim based on copyright and that such a block would breach the provisions of the TSM Regulation.¹³ One involved party petitioned for a review of the decisions issued in these procedures by the BVwG.

Although not yet final, decisions from the BVwG have now been issued, which state that such assessment procedures are not permissible in the absence of an explicit legal provision and because a legal interest is lacking on the part of the ISP. The regulatory authority has lodged an appeal with the Supreme Administrative Court in all procedures. Notwithstanding this, an explicit legal provision for an elective assessment procedure decided by the regulatory authority would be certainly be helpful here. This appears necessary in particular to safeguard the rights of all internet users to enjoy a free and open internet, and to enhance the legal certainty as experienced by all stakeholders.

4.5 Decisions concerning Art. 4 TSM Regulation

In 2016 a total of five decisions were issued by the TTK in the context of minimum content requirements pursuant to Art. 4 TSM Regulation within the scope of objection procedures pursuant to Art. 25 TKG 2003.¹⁴ In procedure G 129/16, a provision was considered opaque pursuant to Art. 6(3) of the Austrian Consumer Protection Act (KSchG) and also grossly disadvantageous pursuant to Art. 879(3) of the Austrian General Civil Code (ABGB) because there was no definition of the speed normally available in the sense of point (d) of Art. 4(1) TSM Regulation.¹⁵ In several procedures, the average bandwidth available over a period of 24 hours was described by the ISP as the bandwidth that was normally available. In light of potentially significant fluctuations over the course of a day, this practice was seen as a breach of point (d) of Art. 4(1) TSM Regulation.¹⁶ The average is an unsuitable value for representing the speed that the end user can typically expect and is not equivalent to the value that the customer can expect when accessing the service.¹⁷ In addition, neither the normally available speed nor the minimum speed

¹³ TTK 19 August 2019, S 5-8, 10, 13/19.

¹⁴ TTK 27 June 2016, G 129/16 (A1 Telekom Austria AG); 29 August 2016, G 188/16 (UPC Business Austria GmbH); 9 August 2016, G 174/16 (UPC Gesellschaften); 9 August 2016, G 175/16 (UPC DSL Telekom GmbH); 9 August 2016, G 176/16 (UPC Telekabel Wien GmbH).

¹⁵ TTK 27 June 2016, G 129/16 (A1 Telekom Austria AG, final).

¹⁶ TTK 29 August 2016, G 188/16 (UPC Business Austria GmbH); 9 August 2016, G 174/16 (UPC Gesellschaften); 9 August 2016, G 175/16 (UPC DSL Telekom GmbH); 9 August 2016, G 176/16 (UPC Telekabel Wien GmbH).

¹⁷ TTK *ibid.*

was specified as a numerical value but, instead, as a percentage value of the maximum speed. This was classified as a breach of the duty of transparency pursuant to Art. 6(3) KSchG. The companies in question were therefore prohibited from using these clauses in business transactions with immediate effect.

The UPC companies petitioned the BVwG to review the decisions in procedures G 174, 175, 176 and 188/19. By early 2020, all UPC companies except one¹⁸ had merged with T-Mobile Austria GmbH, and therefore ceased to trade and operate as separate business entities. As a consequence, the BVwG declared the petitions lodged by six former UPC companies as null and void, and terminated these procedures.¹⁹

4.6 Review of R 3/16 by the BVwG

In 2016 a supervisory procedure was initiated against A1 Telekom Austria AG as a result of its suspected breaches of net neutrality legislation. In its decision on R 3/16 issued on 18 December 2017, the TTK identified various breaches of Art. 3 of the TSM Regulation and stipulated the following corrective actions:

- Discontinuation of the prioritisation of the video-on-demand (VoD) component of 'A1 TV', within a period of three years.
- Discontinuation of IP connection disconnection after 24 hours by extending this connection duration to 31 calendar days, within a period of six months.
- Discontinuation of billing (sur)charges for the assignment of public IP addresses, within eight weeks. Followed by repayment of charges billed for this service since 30 April 2016, within a period of three months.

A1 petitioned the BVwG to review this decision.

In April 2020, the BVwG rejected the petition from A1 Telekom Austria AG as unjustified and granted the right to appeal this decision.²⁰ This judgement is not yet final.

The following section provides an overview of the key aspects of the procedure mentioned.

¹⁸ UPC Telekabel-Fernsehnetz Region Baden Betriebsgesellschaft m.b.H. The BVwG has not yet issued a decision concerning this company's petition.

¹⁹ BVwG 19 February 2020, W179 2134681-2/9E; 19 February 2020, W179 2135190-2/3E; 19 February 2020, W179 2135191-2/3E; 19 February 2020, W179 2135193-2/3E; 19 February 2020 W179 2135194-2/3E; 19 February 2020, W179 2135195-2/3E.

²⁰ BVwG 23 April 2020 W120 2183616-1/29E.

Specialised service

As part of a request-for-information procedure, it was found that one of the TV and video-on-demand services offered by A1 Telekom Austria AG via the IAS bandwidth was prioritised. This means that when this service is active, the reserves end-user device a specified bandwidth, which is then no longer available for IAS. This posed the question as to whether such constituted a specialised service within the meaning of Art. 3(5), with regard to the VoD components (video library and ‘catch-up TV’). Subsequently, in the procedure in question pursuant to Art. (1) TSM Regulation in conjunction with Art. 3(5) as well as Par. 116 et seq. of the BEREC Guidelines, the issue of the technical need for optimisation (in terms of prioritisation) had to be clarified. A specialised service was assumed for the live IPTV components of the bundled product.

As part of the procedure, a technical and economic evaluation report was commissioned, which after in-depth analysis came to the conclusion that the video-on-demand service did not require data transfer prioritisation either in a technical sense, or in a commercial sense (ultimately given substitutes on the internet). Among other things, A1 Telekom Austria AG argued in detail that the bundled product should be viewed as a whole, and that it was not permitted to unravel a bundle of services. These arguments could not be accepted because such an approach would allow providers to ‘bundle’ specialised and non-specialised services. The TKK therefore declared that, given the lack of a need for prioritisation, the VoD service did not fulfil the specialised services requirements and the prioritisation of this service should therefore be discontinued. The period set for discontinuing prioritisation was three years, since the service had been provided in this form before the TSM Regulation entered into force and (presumably) in accordance with laws prevailing at that time, while the TSM Regulation provides for no additional transitional periods and the technical changeover is a large-scale endeavour for the ISP.

The BVwG agreed with the opinion expressed by the regulatory authority. There is no objective technical need to optimise the service in question in order to meet a level of quality that exceeds the level of quality met by non-‘prioritised’ data transmissions.

Nor does the BVwG view the setting of a three-year period for discontinuation following the delivery of the decision in question, which requires the cessation of the unlawful circumstances on the part of A1 Telekom Austria AG, as itself unlawful, since A1 Telekom Austria AG did not contest the underlying reasons for setting this period or the period’s duration in its petition.

Disconnection of the IP connection after 24 hours

In the petitioned decision, the TKK stated that A1 Telekom Austria AG disconnected the IP connections of its users after 24 hours, regardless of whether or not data transmissions were currently taking place. If users wished at some point to provide services themselves, this service provision capability would accordingly be interrupted every 24 hours. Even if a dynamic DNS service were to be used, this would result in a daily interruption of end-user service provision capability and therefore represent a restriction of rights granted to end users by Art. 3(1) TSM Regulation.

This view is shared by the BVwG. An IP connection is to be maintained for as long as possible and in particular for the operation of webservers for websites, blogs, smart home systems, IP alarm systems or IP camera systems, and is also relevant for online gaming.

A1 Mobile Dynamic IP

The TKK also stated that end users have the right to provide services pursuant to Art. 3(1) TSM Regulation. Agreements about commercial practices or technical features pursuant to Art. 3(2) TSM Regulation must not restrict the rights granted by Art. 3(1) TSM Regulation. In order to provide their own services or applications, the end user requires a public IPv4 address (as a minimum: a dynamic address) that this user is accordingly assigned by their ISP. For users who had concluded a contract for internet access services using the mobile telecommunications network operated by A1 Telekom Austria AG, A1 Telekom Austria AG requires these users to purchase the 'A1 Mobile Dynamic IP' option in order to be assigned such an address. This option is billed by A1 at EUR 2.28 monthly, in addition to the basic monthly fee for the internet access service. The TKK stipulated the discontinuation of billing (extra) fees for the assignment of public IP addresses, within eight weeks, followed by the repayment of charges billed for this service since 30 April 2016, within a period of three months.

The BVwG stated that the end user can exercise the rights guaranteed by Art. 3(1) TSM Regulation only if a dynamic public IP address is made available to this user. Accordingly, any agreement concerning the levying of an additional fee represents a restriction to the rights of the end user.

The assignment of a public IP address (as a minimum: a dynamic address) is a requirement that has to be met in order for an end user to be able to provide services and applications. In light of this fact – and unlike the resource of bandwidth, for example – the assignment of a dynamic public IP address is an essential requirement for an end user to be able to exercise their rights to provide services and applications themselves, as codified by Art. 3(1) TSM Regulation. Accordingly, the additional levying of a fee for the exercising of a right guaranteed by Art. 3(1) TSM Regulation, as is the case here, namely for the opportunity to provide services and applications by the end user, constitutes a separate contractual fee for an end-user right codified by Art. 3(1) TSM Regulation. In the opinion of the BVwG, the technical conditions necessary for the exercising of the rights guaranteed by Art. 3(1) TSM Regulation must therefore already be included in the price agreed pursuant to Art. 3(2) for the provisioning of the internet access. The order to repay any fees already charged to end users is equally lawful. As already noted above, this decision is not yet final.

4.7 Overview of suspected breaches of net neutrality

Table 3 below provides an overview of cases involving suspected breaches of net neutrality, listing the categories, the number of cases and the status and duration of procedures. More detailed descriptions of the cases can be found under the individual subsections of section 4. It should be noted that for 'Number of cases' facts are collected separately, some of which are aggregated and consequently result in a smaller number of cases.

TABLE 3: OVERVIEW OF CATEGORIES OF SUSPECTED NN BREACHES

KEY:  Voluntarily discontinued  Procedure pending  Pending before a court
 Procedure terminated  Discontinued by official decision

CATEGORY ²¹	NUMBER OF CASES	PROCEDURE STATUS*	PERIOD
Port blocking	21	 8  1	Q2/19–Q2/20
Private IP addresses	5	 3  2  1	Q2/19–Q2/20
Zero-rating	0		
Specialised services	0	 1	Prior to Q2/20
Technical discrimination and restriction of internet access	0	 1	Prior to Q2/20
Traffic redirection (proxy)	0		
No server operation possible	0		
Disconnection of IP connections	4	 2  1  1  1	Q2/19–Q2/20
Blocking websites due to copyright claims	8**	 6  2	Q2/19–Q2/20

* The status of procedures pending or dropped/concluded with a decision in the reporting period, including procedures from previous periods awaiting a court decision.

** Eight procedures were initiated, the number of affected websites is higher.

²¹ The zero-rating category, mentioned in table 2 as a problematic practice in the context of the TSM Regulation, is not considered in this table, as zero-rating as such has yet to result in an official procedure. Zero-rated products are monitored continuously by the regulatory authority.

4.8 Measures taken/applied in accordance with Art. 5(1)

In the third reporting period (ending in April 2020), no measures as defined in Art. 5(1) TSM Regulation became necessary to ensure compliance with the provisions of that paragraph. This was because dialogue was initiated with the companies early on and discussions usually resulted in constructive solutions compliant with the TSM Regulation. Numerous procedures pursuant to Art. 5(1) and (2) were initiated but then dropped without an order by official decision (e.g. because of the voluntary resolution of the issue by the ISP); such cases are not listed here. The regulatory authority nonetheless monitored compliance with the provisions of Art. 3 and Art. 4 TSM Regulation on an ongoing basis.

The decisions on measures issued against A1 Telekom Austria AG in December 2017 pursuant to Art. 5(1) of the TSM Regulation remain valid (cases R 3/16 and R 5/17). The decision from the BVwG on the R 3/16 petition proceedings is now available (for details, see 4.6). The decision issued by the regulatory authority was confirmed in its entirety. The court's decision was not yet final at the end of the reporting period. A decision from the BVwG on R 5/17 is still awaited from the petition proceedings.

TABLE 4: PROCEDURES IN ACCORDANCE WITH ART. 5(1) TSM REGULATION PENDING IN REPORTING PERIOD

KEY:  petitioned  final

PROCEDURE	ISP	BRIEF DESCRIPTION	DATE OF DECISION	STATUS
R 3/16	A1 Telekom Austria AG	<ul style="list-style-type: none"> Prohibition of prioritising a VoD service for lack of a specialised service, within 3 years Free assignment of public IPv4 at customer demand Increase in period for disconnecting IP connections from 24 hours to 30 days 	2017-12-18	
R 5/17	A1 Telekom Austria AG	Prohibition of applying traffic-shaping to an add-on package with zero-rated audio and video streaming services	2017-12-18	
R 1/18	LIWEST Kabelmedien GmbH	Supervisory procedure pursuant to Art. 5 TSM Regulation on the auditing of access blocks for certain websites due to injunction claims based on copyright Procedure dropped; no breach of Art. 3 TSM Regulation identified.	2018-11-26	
R 2/18	kabelplus GmbH			
R 3/18	Salzburg AG für Energie, Verkehr und Telekommunikation			
R 4/18	T-Mobile Austria GmbH			
R 5/18	UPC Telekabel Wien GmbH, UPC Telekabel-Fernsehnetz Region Baden Betriebsgesellschaft m.b.H., T-Mobile Austria GmbH			
R 8/18	Hutchison Drei Austria GmbH			
R 9/18	A1 Telekom Austria AG			
R 1/19	kabelplus GmbH	Supervisory procedure pursuant to Art. 5 TSM Regulation on the auditing of access blocks for certain websites due to injunction claims based on copyright Procedure dropped; no breach of Art. 3 TSM Regulation identified.	2019-04-12	
R 2/19	Salzburg AG für Energie, Verkehr und Telekommunikation			
R 3/19	Hutchison Drei Austria GmbH			
R 4/19	A1 Telekom Austria AG			

PROCEDURE	ISP	BRIEF DESCRIPTION	DATE OF DECISION	STATUS
R 5/19	LIWEST Kabelmedien GmbH	Supervisory procedure pursuant to Art. 5 TSM Regulation on the auditing of access blocks for certain websites due to injunction claims based on copyright Procedure dropped; no breach of Art. 3 TSM Regulation identified.	2019-04-12	<input checked="" type="checkbox"/>
R 6/19	UPC Telekabel Wien GmbH, UPC Telekabel-Fernsehnetz Region Baden Betriebsgesellschaft m.b.H., T-Mobile Austria GmbH, Lisa Film GmbH			
R 7/19	T-Mobile Austria GmbH	Supervisory procedure pursuant to Art. 5 TSM Regulation on the auditing of access blocks for certain websites due to injunction claims based on copyright Procedure dropped; no breach of Art. 3 TSM Regulation identified.	2019-07-08	<input checked="" type="checkbox"/>
R 8/19	A1 Telekom Austria AG	Supervisory procedure pursuant to Art. 5 TSM Regulation on the auditing of access blocks for certain websites due to injunction claims based on copyright Procedure dropped; no breach of Art. 3 TSM Regulation identified.	2019-10-22	<input checked="" type="checkbox"/>
R 11/19	Hutchison Drei Austria GmbH	Supervisory procedure pursuant to Art. 5 TSM Regulation on the auditing of access blocks for certain websites due to injunction claims based on copyright Procedure dropped; no breach of Art. 3 TSM Regulation identified.	2020-03-17	<input checked="" type="checkbox"/>
R 12/19	kabelplus GmbH			
R 13/19	T-Mobile Austria GmbH			
R 14/19	LIWEST Kabelmedien GmbH			

4.9 Zero-rating monitoring activities

Pursuant to Art. 5(2) of the TSM Regulation, NRAs can request information from ISPs in relation to Art. 3 and Art. 4 of the TSM Regulation. Twice yearly therefore, RTR verifies the most important indicators in relation to zero-rating pursuant to Art. 3(2) of the TSM Regulation.

As of April 2020, 43 different tariff plans that included zero-rated offers were being marketed by one mobile service provider (A1 Telekom Austria AG with the brands Kurier mobil, Krone mobile, Educom and Yesss!). In addition, there are twelve add-ons – in other words, packages that can be added to specific or to all tariff plans – from two providers (A1 Telekom Austria AG, including Yesss!, and Hutchison Drei Austria GmbH), which means that at present, offers from a total of two companies are available on the market. However, in the case of two of these brands under A1 Telekom Austria AG – Kurier mobil and Krone mobile – the only service offered that does not count towards the included data is the electronic download of their newspaper product as ePaper. As the customer base of A1 Telekom Austria AG brands is small in comparison with the core brand (4.3 per cent of all private customers in whose tariff zero-rating is available as of April 2020), the further analysis does not examine these brands separately.

In the reporting period, A1 Telekom Austria AG changed its tariff portfolio and now also offers nearly all new tariff plans with zero-rating. Excluded from the above are those tariff plans which already include unlimited data volumes and are therefore not of interest for zero-rating. Thus, A1 Telekom Austria AG offers under its core brand 16 tariff plans with zero-rating for private customers and 13 for business customers. Previous tariff plans that do not include zero-rating also continue to offer the option of using zero-rating in the form of an add-on package. The focus of the further analysis is on private customers, as business customers only make up 18 per cent of total A1-customers (with zero-rating). Specifically A1 Telekom Austria AG has structured its own zero-rating offer to encompass the five zero-rating categories of audio/music streaming services, video streaming services, chat services, social media services and, since August 2019, gaming services. Generally speaking, any of a CAP's applications that can be allocated to one of the five categories can be included in A1 Telekom Austria AG's zero-rating component, making it accessible for the end user without the data used in connection with the service counting towards the included data. The wholesale offer of A1 Telekom Austria AG is basically open, which the authority rates positively.

The included services concerned stand out because zero-rated chat services are now included in every tariff plan (table 5). However, zero-rated video streaming services are only available in the higher-priced tariff plans. The most recent category of gaming is only included in tariffs for young people.

TABLE 5: SERVICES INCLUDED IN A1 TARIFF PLANS (AS OF APRIL 2020)

	Audio	Video	Chat	Social media	Gaming
A1 Go! S	x		x		
A1 Go! M	x		x	x	
A1 Go! L	x	x	x	x	
A1 Go! XL	x	x	x	x	
A1 Go! Premium	x	x	x	x	
A1 Xcite S	x		x		x
A1 Xcite L	x		x	x	x
B.free M			x		
B.free L			x		
A1 Mobil S	x		x		
A1 Mobil M	x		x	x	
A1 Mobil L	x	x	x	x	
A1 SIMply S			x		
A1 SIMply M			x		
A1 SIMply L			x		
A1 SIMply XL			x		

Source: RTR internet research, 15 June 2020

The design of zero-rated products means that in order to ensure correct billing, traffic generated by the end user must be assigned to the various billing categories. Here compliance with GDPR must be guaranteed. In RTR's view, while the use of the IP address for traffic identification appears unproblematic and also complies with BEREC guidelines, doubts nevertheless arise as to whether other distinguishing features such as SNI and URLs are compatible with applicable data privacy law. RTR is therefore in discussions with the Data Protection Authority over products that a transparency study has empirically shown to be using features in addition to the IP address. RTR considers this problematic and has already pointed out the deficiency. To date RTR has not received any end user complaints in this regard.

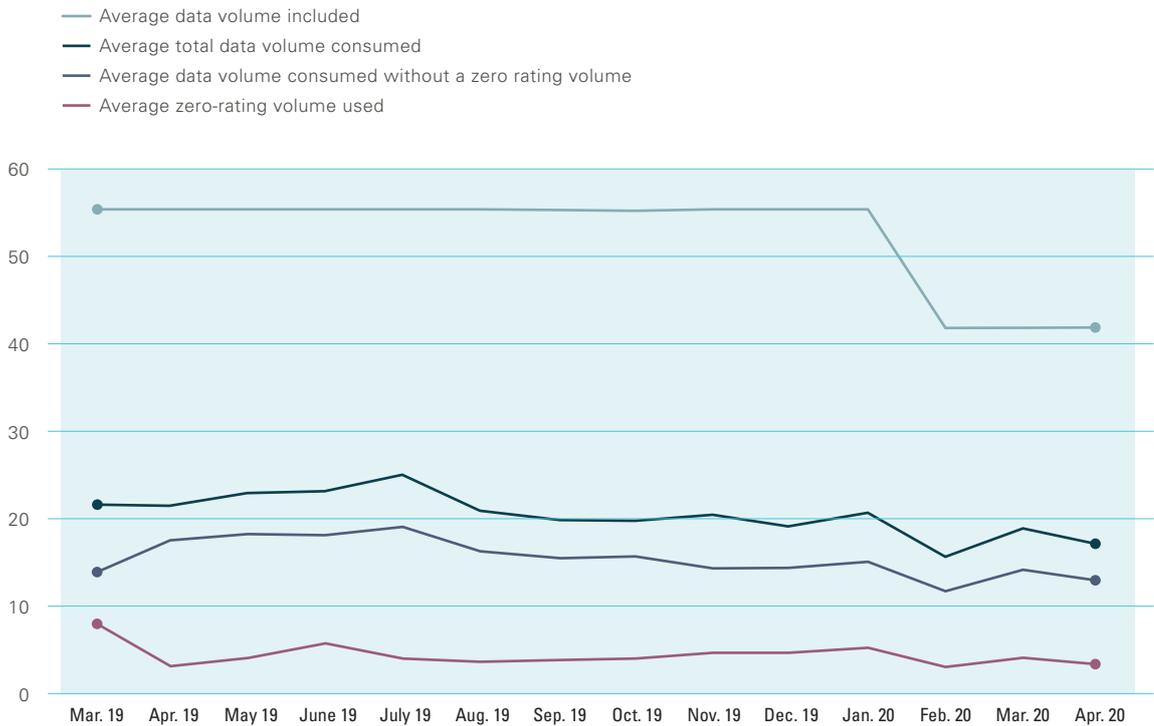
Furthermore, A1 Telekom Austria AG offers add-ons even for contracts entered into before 1 May 2017. Nevertheless, the vast majority of zero-rating customers at A1 Telekom Austria AG originate from new contracts, since any growth in the number of tariff plans under the core brand always means growth in zero-rated customers as well. Hutchison Drei Austria GmbH, as the second provider of zero-rated products, introduced in this reporting period the Amazon Music Unlimited add-on option, where data consumed through streaming is not counted towards the data volume included in the tariff. Hutchison Drei Austria GmbH is also offering a zero-rated Spotify add-on as well as its own zero-rated services (3 Cloud, 3 Film, 3 TV, 3 MobileTV and 3 Kiosk). In contrast to A1 Telekom Austria AG's open zero-rating portfolio, these add-on options are currently limited to content partners preselected by Hutchison Drei Austria GmbH, which is viewed as problematic from the perspective of net neutrality.

Here also, traffic is not solely identified by the IP address, a situation already criticised above. The proportion of Hutchison Drei Austria GmbH customers who use a zero-rating option is about 9 per cent of all Hutchison Drei Austria GmbH customers. The number of users of Hutchison Drei Austria GmbH zero-rated products increased by about 5.5 per cent from May 2019 to April 2020. Given that the number of actual users of zero-rated offers from Hutchison Drei Austria GmbH is considerably lower than that for A1 Telekom Austria AG and that the products are not directly comparable (zero-rating as an integral product component versus add-on options), the following section primarily focuses on the A1 Telekom Austria AG product range.²²

The number of customers with zero-rated tariffs under the A1 core brand has approximately doubled from March 2019 to April 2020. While the number of customers with previous tariff plans has increased, there has also been an increase in new customers in the new tariff categories. Furthermore, A1 also reported a data correction, which led to quite a significant rise in subscribers. Therefore, almost 10 per cent of all A1 Telekom Austria AG smartphone and data subscription customers now have a tariff plan that includes zero-rating.

²² In this regard it is seen that the option of adding zero-rated services to the tariff plan is used considerably less with A1 Telekom Austria AG than with Hutchison Drei Austria GmbH.

FIGURE 2: ZERO-RATED DATA VOLUMES



Source: RTR estimate

Figure 2 shows that the average data volume included in A1-tariff plans with zero-rating declined by about 23 per cent from March 2019 to April 2020 due to a modified product range. This change only relates to tariff plans with a data cap. Over the same period, three tariffs with unlimited data volumes were introduced and these are mostly in the high-price segment, however. The number of A1 customers with an unlimited data subscription is still very small as these products have only been available on the market since February 2020.

In terms of consumption, average data volume consumed (per user) across all tariffs declined in total by about 20 per cent from March 2019 to April 2020, while average zero-rated volume consumed per user – when considered across all tariffs – dropped by almost 50 per cent. Excluding the very atypical months of February and March 2019 (here it is assumed that the availability of all seasons of Game of Thrones led to an exceptional situation) and a comparison is made with the month of April 2019, the average zero-rated volume consumed can be seen to have hardly increased.

Measured as a ratio of zero-rated data volumes used and data volumes included in the tariff, the utilisation rate across all zero-rated tariff plans in April 2020 was between 4 and 22 per cent – irrespective of the tariff plan. The proportion has therefore increased in comparison with the last reporting period (in April 2019 it was still between 5 and 10 per cent).

In addition, in 2019 there was a ten-fold increase in weighted average consumption by zero-rating subscribers across all private customer tariff plans in comparison with 2018; in this reporting period, on the other hand, the increase was only 1.5 times as much, probably because of the significant expansion of the zero-rating customer base (with zero-rating as a fixed component of many tariff plans).

The actual ‘consumption’ of data by consumers usually falls far below their included data – in other words, they generally wish to remain on the safe side when choosing a tariff. In view of this fact, the ratio of data consumed using zero-rated services to the total volume of data actually consumed (including zero-rating) can provide further insights. Depending on the tariff plan this ratio ranges from 10 to 30 per cent for private customers. This represents a small rise from last year, when the ratio increased from well below 10 per cent to as high as 30 per cent.

These traffic ratios mean that the included average volume in each tariff plan is significantly above the average zero-rated volume consumed. In other words, the zero-rated volume utilised within the tariff plan on average by all customers could also be easily covered through the included data. Customer would therefore have the option to always use one or several alternatives for every individual service used within the zero-rating framework, without incurring any additional costs. Customers could therefore generally test other services and support innovation. The proportion of customers who exceeded their data cap – depending on the private customer tariff plan – is between less than 1 per cent and almost 9 per cent. The data caps were exceeded mainly in the tariff plans for young people.

The table below provides an overview of the A1 Telekom Austria AG product portfolio for private customers who make up the majority of zero-rating subscribers. Because A1 Telekom Austria AG changed its product portfolio in early 2020, it is attempted to identify comparable tariffs where possible.

TABLE 6: RANKING OF A1 TARIFF PLANS

Ranking by absolute price (low to high) as of 04/2020	Ranking by price/GB (low to high) as of 04/2020	Tariff plan	Price (absolute) 04/20	Per GB incl. VAT 04/19	Per GB incl. VAT 04/20	Price change
6	1	A1 SIMply XL	€ 36.9		1.23	-
5	2	A1 Xcite L	€ 32.9	1.27	1.27	0%
4	3	A1 SIMply L	€ 26.9		1.35	-
3	4	A1 Xcite S	€ 22.9	1.43	1.43	0%
2	5	A1 SIMply M	€ 18.9		1.89	-
9	6	A1 Mobil L (A1 Go! L)	€ 59.9	2.50	2.00	-20%
8	7	A1 Mobil M (A1 Go! M)	€ 49.9	3.12	2.50	-20%
1	8	A1 SIMply S	€ 14.9		2.98	
7	9	A1 Mobil S (A1 Go! S)	€ 39.9	4.99	3.99	-20%

Source: RTR internet research, 16 June 2020

Table 6 shows that due to the change in the product portfolio, the price per GB of the products comparable to the old product portfolio has dropped by 20 per cent. However, due to the previously low subscriber numbers to the new tariffs, no general observations can be made. It should be noted that the former A1 Go! tariffs as well as their successors tend to be found in the high-price segment (both in relation to price per GB and absolute price), whereas the new products offered without mobile phones have both a lower price/GB ratio and also a lower absolute price. The Xcite tariffs for young people fall within these tariff categories.

A glance at the monthly tariff survey by the Vienna Chamber of Labour²³ clearly shows that there are sufficient alternative offers for customers. The fact that tariff plans without zero-rating are also available to customers is important, so they are not restricted in their choice of services.

In summary, the availability of zero-rated offers in the Austrian market is continuing to increase, while a trend towards flat rates can also be identified. As customers in general tend to remain more on the safe side in relation to their data consumption and perhaps therefore tend to use zero-rated applications, it is important here to ensure that the data cap is high enough. The fact that only a few customers reach or exceed their data cap, along with the ratios presented above, would suggest that customers have sufficient data volume available to use all services even without zero-rating and that sufficient data volume is also available for the use of alternative offers. A second important question is whether zero-rating ultimately leads to an increase in the price per GB. No such price rise has been observed to date.

²³ Vienna Chamber of Labour 2020: Tariff information (AK-Tarifwegweiser), https://wien.arbeiterkammer.at/beratung/konsumentenschutz/handyundinternet/festnetzundvoip/Die_AK-Tarifwegweiser.html

05 Other indicators and activities

5.1 RTR conciliation procedures

Within the scope of conciliation procedures (Art. 122 TKG 2003), RTR's conciliation body processes requests of customers who do not agree with their ISP's level of performance or billing. In the reporting period, a total of 1,906 conciliation requests were filed.

One important subject within conciliation procedures with regard to the TSM Regulation concerned complaints about network quality. Such complaints usually do not concern the failure to meet the minimum content requirements specified in Art. 4 of the TSM Regulation (such as minimum speed, maximum speed, normally available speed and advertised speed), since these items are already verified in the objection procedure pursuant to Art. 25 TKG 2003. The complaints concern the bandwidth available to customers in specific individual cases (upload and download speed). In most cases these relate to claimed 'poor contract performance' by the ISP. The procedure involves compulsory verification as to whether the service is actually provided as contractually agreed.

Here transparency in the case of mobile internet connections is considered particularly problematic. The prescribed advertised and estimated maximum bandwidth set out in the TSM Regulation has only marginal relevance for most users. Much more important is the actual bandwidth available even during peak hours. The TSM provides no additional guidance on this issue, and each individual contract must be interpreted separately. In practice therefore predictability does not exist from the users' perspective. This situation is aggravated through the lack of a reliable and comprehensive legal framework. In the end this means that the legal position of users in relation to internet access apparently has potential for improvement. Even if it is difficult to implement performance promises in the case of mobile internet connections, an urgent need to accordingly adapt provisions would seem to exist. On a positive note, it should be mentioned that in most cases ISPs are prove highly aligned with user needs, and problem cases are generally solved amicably.

The number of complaints in connection with bandwidth in the current reporting period corresponds to the number in the preceding reporting period (see below), and there was also a comparable number before the TSM Regulation entered into force. Thus, there was a marginal increase in related complaints as a result of the TSM Regulation.

With regard to 'quality of mobile networks', the conciliation body received a total of 100 requests in the reporting period (previous reporting period: 94).

Relating to 'quality of fixed networks', there were 32 requests in the reporting period (previously 26).

In relation to the corona crisis there have only been a few procedures. These mainly concerned the quality of internet access, caused primarily by overload (simultaneous e-learning and home office work). Here RTR has tried to provide support at least through information.²⁴

5.2 General requests

RTR also received enquiries regarding net neutrality aside from conciliation procedures. Specifically, there were enquiries regarding minimum content pursuant to Art. 4 TSM Regulation, public and private IP addresses, free choice of routers, zero-rating, and port blocking.

5.3 Indicators of continuous availability of non-discriminatory IAS

Art. 5(1) of the TSM Regulation requires national regulatory authorities to ensure compliance with Art. 3 and Art. 4 TSM Regulation and to promote the continued availability of non-discriminatory internet access services at levels of quality that reflect advances in technology.

To support a comprehensive perspective and a more accurate estimate of progress, the following charts also show the long-term trend. The charts are interpreted only for the reporting period, however. In the explanations that follow, reference is therefore made to the most recent set of available figures.

The following indicators²⁵ were deemed relevant to depict the continued availability of non-discriminatory internet access services (IAS) at levels of quality that reflect advances in technology:

- Number of broadband connections
- Distribution of download and upload speeds in the reporting period
- Median of download and upload speeds and latency over time
- Distribution of download and upload speeds by hour of day
- Price baskets: fixed vs. mobile broadband
- Quality dimensions

²⁴ RTR 2020: Tips for internet and telephone during the corona crisis (<https://www.rtr.at/de/tk/TippsfrInternetundTelefonwhrendderCoronakrise>; in German).

²⁵ Detailed analyses are available in the current RTR Internet Monitor (<https://www.rtr.at/en/inf/internet-monitor-jahresbericht-2019>).

FIGURE 3: FIXED AND MOBILE BROADBAND CONNECTIONS²⁶



Source: RTR – KEV survey

Figure 3 shows the total number of fixed and mobile broadband connections. Within mobile broadband, a distinction is made between mobile data subscriptions (without minutes and texts included) and smartphone subscriptions (with minutes and texts included). M2M SIM cards are not shown in the chart. A continuous increase is seen in the number of broadband connections since 2017. The number of smartphone subscriptions in particular has risen, specifically from 6.81 million in Q2 2019 to 7.14 million in Q1 2020. The number of mobile data subscriptions fell from 2.62 million in Q2 2019 to 2.5 million in Q1 2020. After a slight decline compared with 2018, the number of fixed broadband subscriptions rose again in Q2 2019 (2.51 million) to 2.53 million in Q1 2020.

Data (Open Data)²⁷ generated with the help of the RTR-NetTest²⁸ are used to assess the quality of internet access. The RTR-NetTest allows users to check the speed and quality of their internet connection, reliably and independently of their provider. From Q2 2019 up to and including the first quarter of 2020,²⁹ the RTR-NetTest was used for unrepeated measurements over 1,040,000 times in Austria (with a location accuracy of less than 2 km). More than 249,000 of the tests were mobile service measurements. Year-on-year, an increase was seen both in overall measurements and the number of mobile service measurements.

²⁶ Data on broadband connections are collected quarterly in accordance with the Communications Survey Ordinance (KEV). The definition of mobile broadband connections was revised from Q4 2017 under the amendment to the KEV. Specifically, from the fourth quarter post-paid connections are only counted if the internet was accessed at least once in the quarter. This explains the drop in the category of mobile data subscriptions from the third to the fourth quarter of 2017. Until Q3 2017, smartphone subscriptions were only counted if they were post-paid contracts. From the fourth quarter of 2017, all subscriptions including both data as well as minutes and text messages are considered smartphone subscriptions, regardless of whether post-paid or pre-paid. For details, see the most recent RTR Internet Monitor: <https://www.rtr.at/en/inf/internet-monitor-jahresbericht-2019>

²⁷ The Open Data from the RTR-NetTest are available at <https://www.netztest.at/en/Opendata.html>.

²⁸ Available as a mobile app (Android, iOS) and as a browser test. For details see <https://www.netztest.at/en/>.

²⁹ Section 6 examines in detail how internet usage patterns changed during the corona crisis.

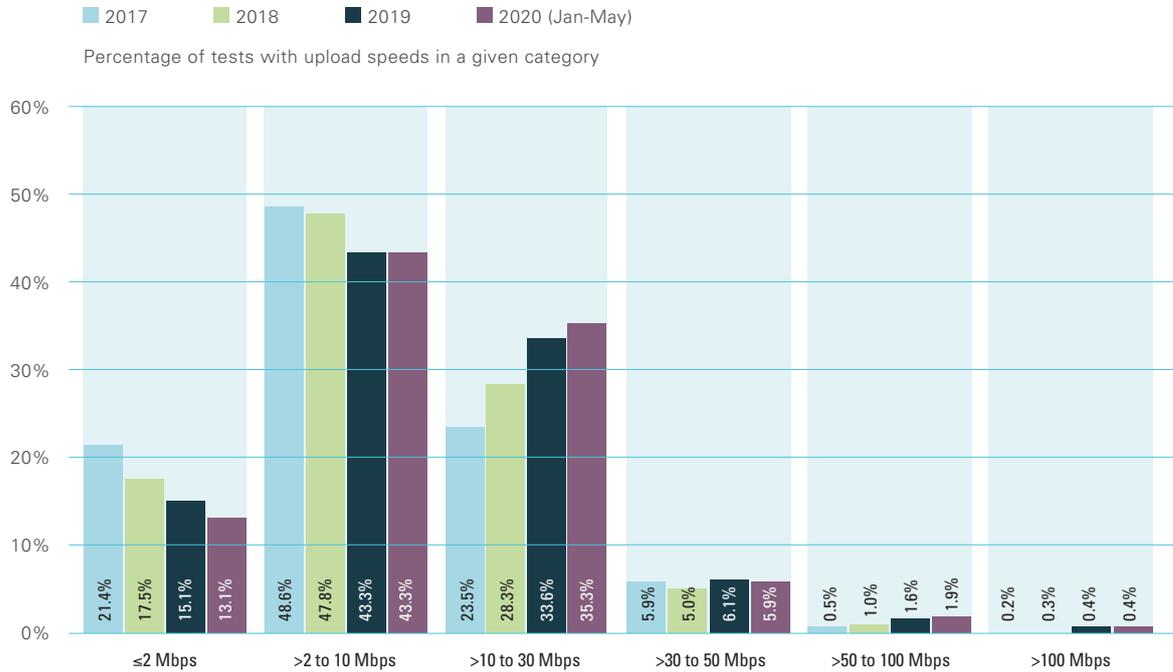
FIGURE 4: DISTRIBUTION OF DOWNLOAD SPEEDS OVER REPORTING PERIOD



Source: RTR-NetTest

Figure 4 reveals the proportions of tests with download speeds in a given category. It can be seen that as early as 2017 most of the measurements display download speeds of 10 to 30 Mbps (almost 40%). Since then this proportion has declined slightly, to about 34 per cent from January to May 2020. The percentage of measurements under 2 Mbps dropped between 2017 and 2019 but rose again slightly from January to May 2020. The percentage of measurements over 100 Mbps rose continuously in the same period and is now at around 9 per cent.

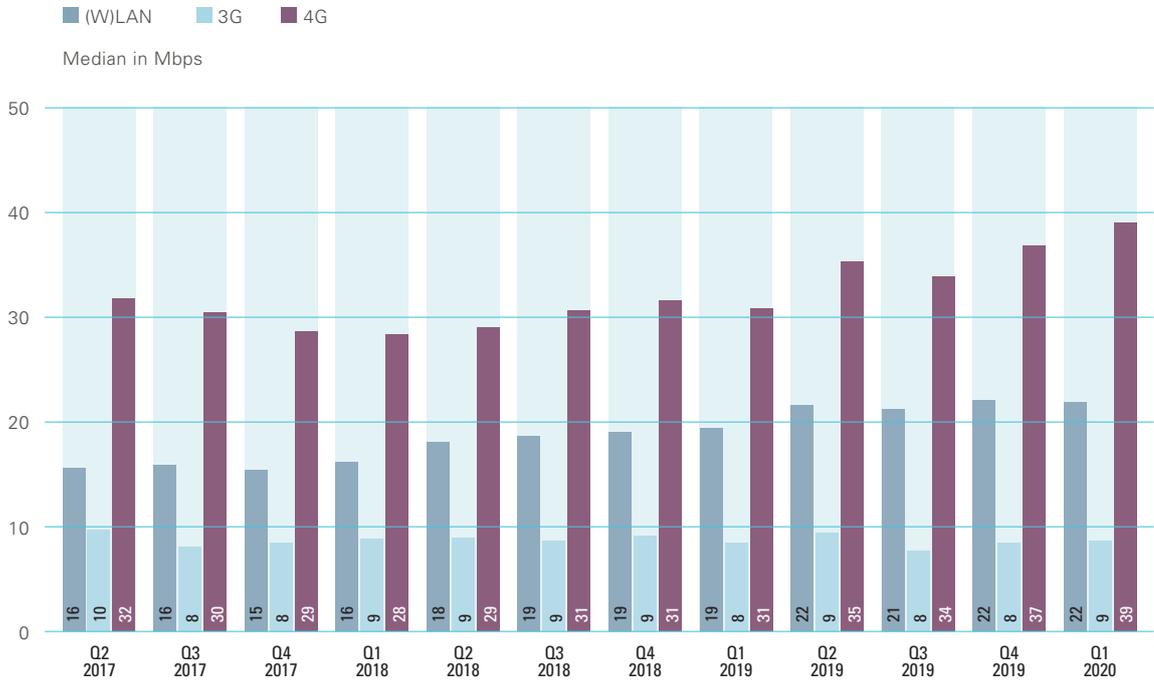
FIGURE 5: DISTRIBUTION OF UPLOAD SPEEDS OVER REPORTING PERIOD



Source: RTR-NetTest

Figure 5 depicts the ratios of tests with upload speeds in a given category. Back in 2017, most of the tests showed an upload speed of 2 to 10 Mbps, and this category still constituted the biggest proportion in the period from January to May 2020, even though the percentage has dropped in recent years. The percentage of tests with an upload speed of less than 2 Mbps can also be seen to have fallen sharply since 2017, whereas the percentage of tests with an upload speed of 10 to 30 Mbps has risen by slightly more than 10 percentage points. The percentage of tests with speeds of 50 to 100 Mbps has increased since 2017 and was just under 2 per cent for the period from January to May 2020. The percentage of tests with a speeds greater than 100 Mbps is still very small, but has increased slightly since 2017.

FIGURE 6: DOWNLOAD SPEED BY TECHNOLOGY



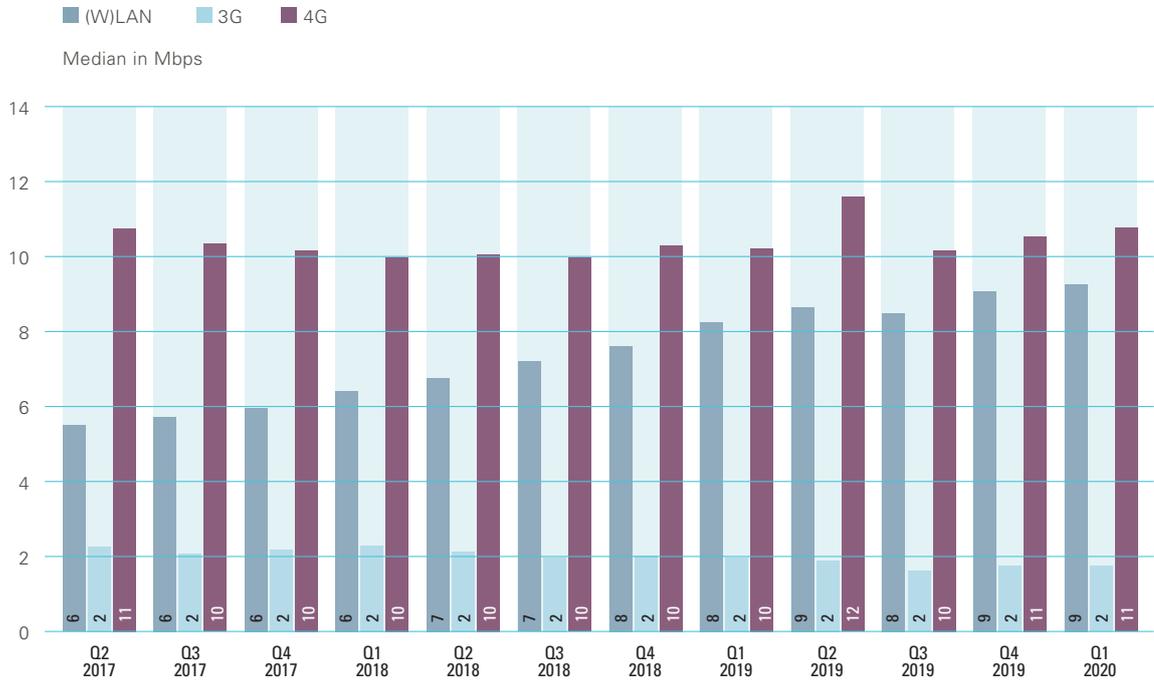
Source: RTR-NetTest

Figure 6 depicts the median³⁰ download speed measured with the RTR-NetTest over time, broken down by type of technology. Internet access speed depends on factors including the technology implemented. Distinctions are made between 2G (GPRS, EDGE), 3G (UMTS, HSPA) and 4G (LTE) as well as on the basis of measurements of various fixed and network technologies. The (W)LAN measurements were taken with the aid of a browser or app and have been aggregated here under the heading of (W)LAN. It can be clearly recognised that, based on median, far higher download speeds can be reached with 4G mobile telecommunications technology than with (W)LAN or 3G.

Up to Q1 2019 the download speed for 4G mobile telecommunications technology fluctuated around 30 Mbps, and then increased up to 39 Mbps in Q1 2020 (with the exception of Q3 2019). The speeds for 3G mobile telecommunications technology tend to be low and in Q1 2020 reached 8.6 Mbps. Speeds for (W)LAN have risen since 2017, with a median of 21.8 Mbps in Q1 2020. Considering the low data transmission rates supported, 2G connections are not included in this and subsequent assessments.

³⁰ The median is appropriate because it is located at the very centre of all (sorted) observations, i.e. 50% of measurements are above and 50% are below the median. It therefore reliably excludes the influence of outliers.

FIGURE 7: UPLOAD SPEED BY TECHNOLOGY

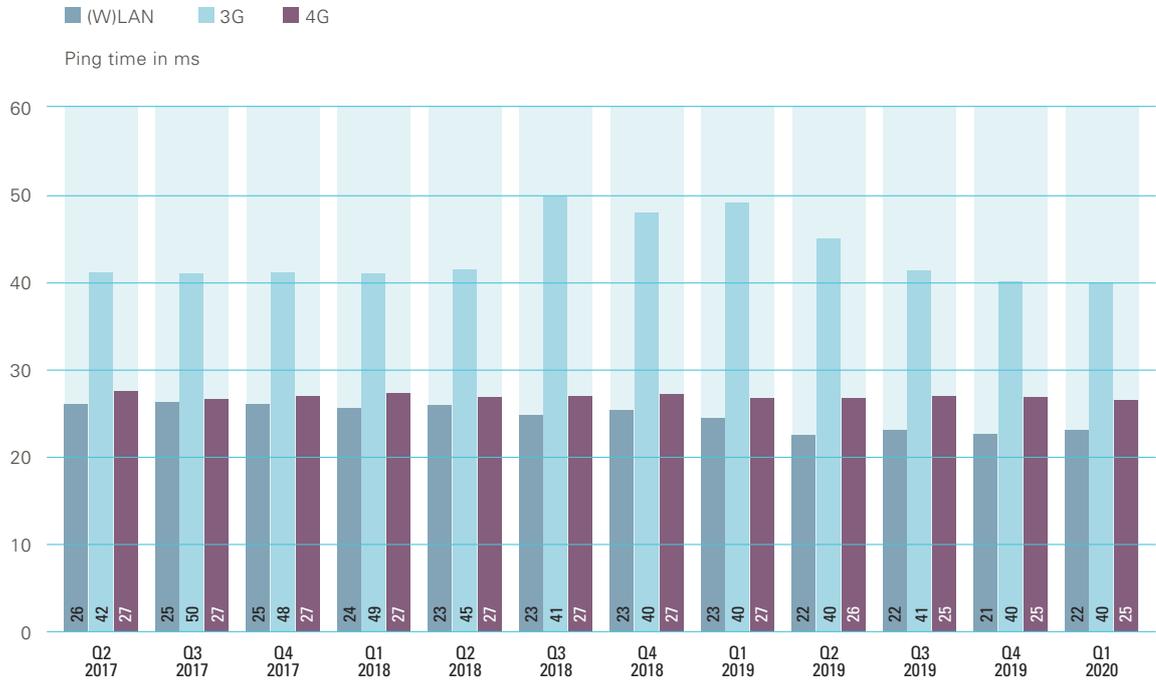


Source: RTR-NetTest

Figure 7 depicts the median upload speed.³¹ While this figure once again underlines the fact that 4G mobile technology enables the fastest upload speeds, in the reporting period a decline from 11.6 Mbps in Q2 2019 to 10.8 Mbps in Q1 2020 was ascertained. The upload speed measured for (W)LAN has risen relatively constantly and was around 9.3 Mbps at the end of the reporting period. The upload speed for 3G mobile connections fluctuated around 2 Mbps and was 1.8 Mbps in Q1 2020.

³¹ Uploading refers to data transfers from a user to the internet. Rarely the subject of advertising, the upload data rate is usually significantly lower than the download speed. Communication in the internet is a two-way street, though, and the upload rate is just as important for fast internet access. The upload data rate is particularly important when sharing photos or files or for video chatting.

FIGURE 8: LATENCY (PING) BY TECHNOLOGY³²

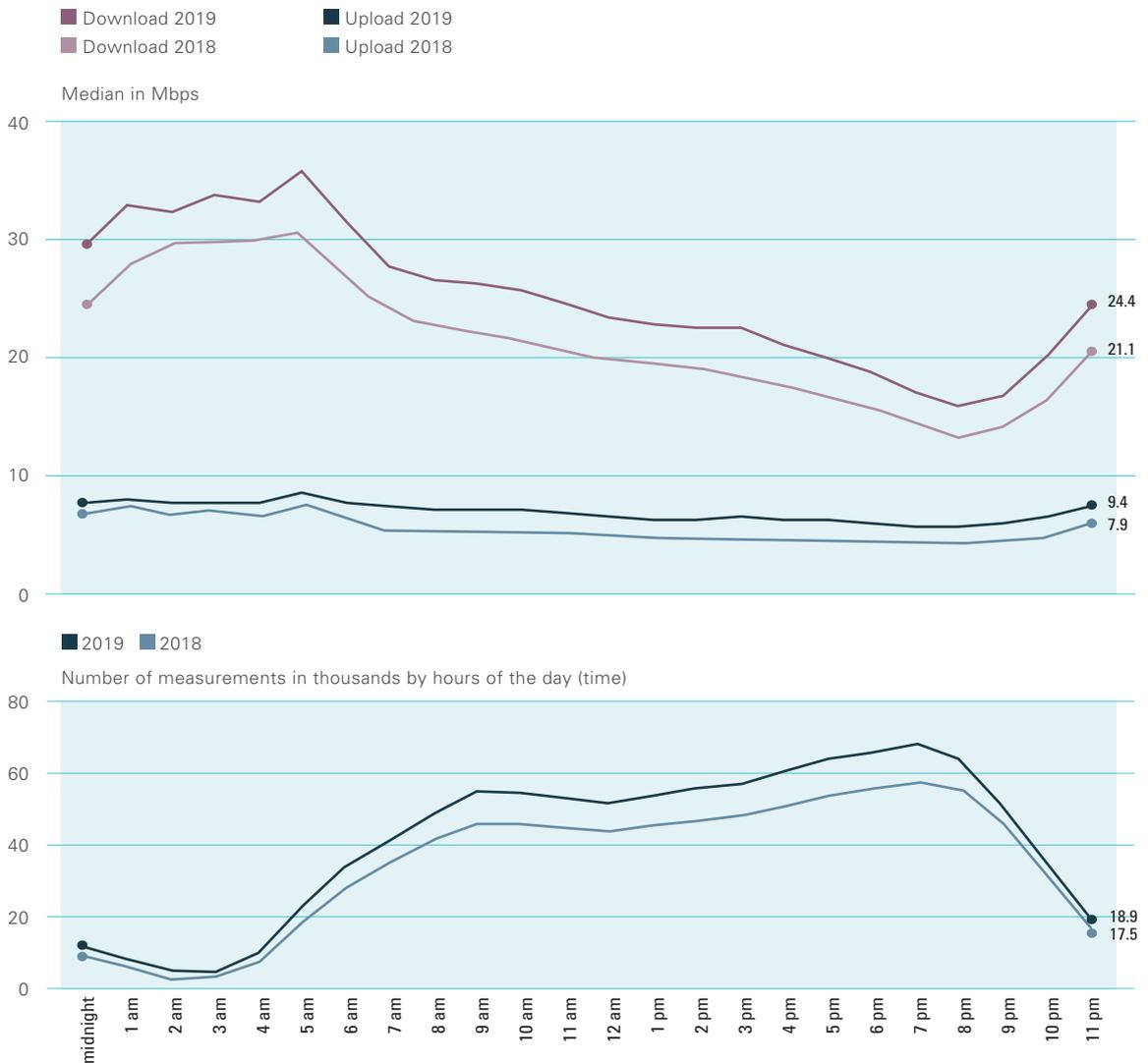


Source: RTR-NetTest

Figure 8 depicts the median latency. Roughly the same figures for latency (in the reporting period these were between 21.4 ms and 25.6 ms) can be achieved using 4G mobile technology and (W)LAN. The figures are relatively constant for (W)LAN and 4G in the reporting period. With 3G mobile telecommunications technology, however, latency is much higher and remains constant at around 40 ms. In comparison with 2017/2018, latency in 3G mobile telecommunications technology has decreased, which is to be welcomed.

³² 'Ping' (or 'latency', the technically correct term) is the time a small data packet needs to make its way from a user device (such as a mobile or laptop) to an online server and back. Ping time is measured in milliseconds (ms). While ping time is a key indicator in relation to applications such as virtual and augmented reality and online gaming, ping time can also have significant bearing on how 'sluggishly' an internet connection responds during 'normal' internet surfing. Both the technology used to access the internet and the extent to which access is utilised significantly affect latency.

FIGURE 9: DOWNLOAD AND UPLOAD SPEEDS BY TIME OF DAY IN 2018 AND 2019³³



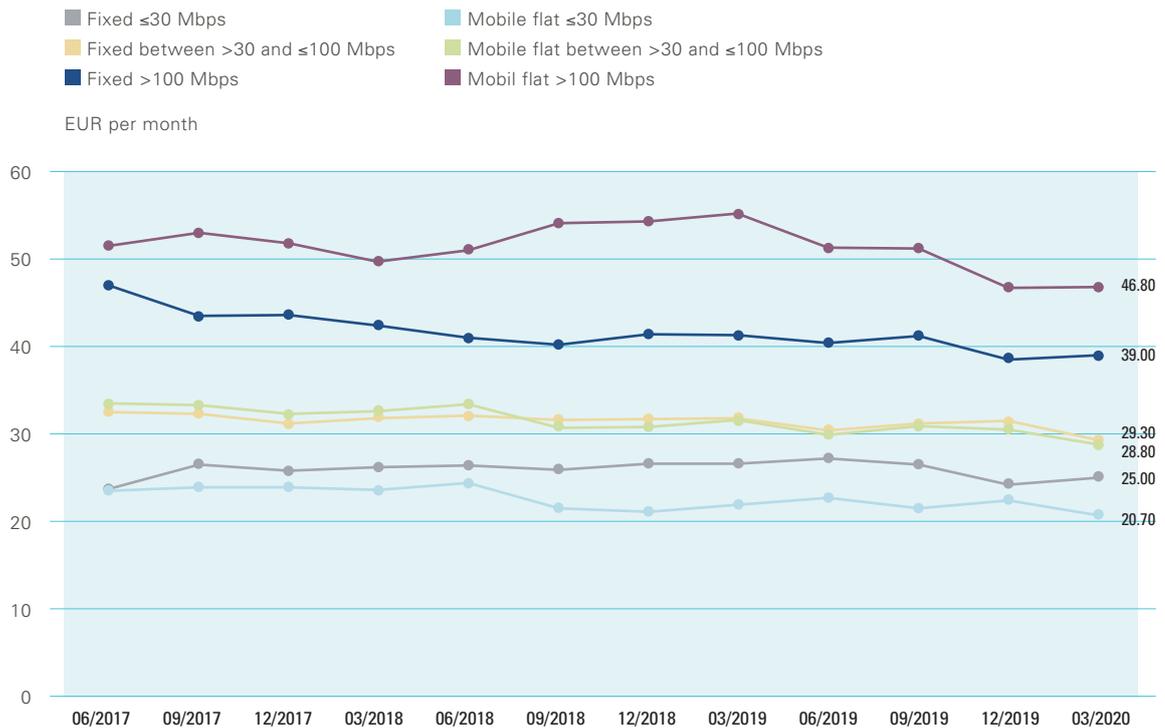
Source: RTR-NetTest

Figure 9 shows the median download and upload speeds by time of day over the last two years. The median download speed in 2019 was slightly higher than in 2018, by an average of approx. 3.5 Mbps. The median upload speed in 2019 was around 1.4 Mbps higher than the figure for the previous year. The figure also shows that the median download speed is considerably lower between 18:00 and 22:00 than in the other hours of the day, although no similar pattern is discernible for the median upload speed. During early morning hours between 1:00 and 6:00, the download speed is the highest, between roughly 30 and 34 Mbps in 2019. In the course of the day the median download speed drops continuously to only about 17 Mbps between 20:00 and 21:00. The median upload speed during the day is between 8 and 10 Mbps.

³³ An evaluation for 2020 is found in section 6 on the corona crisis.

The number of RTR-NetTest measurements varies considerably over the course of the day. Only a few tests are performed during night hours. Most of the measurements in 2019 were performed between 16:00 and 20:00 (over 60,000 every hour). In comparison with 2018, the measurements performed increased for every hour of the day.

FIGURE 10: PRICE BASKETS: FIXED VS. MOBILE BROADBAND



Source: RTR survey

Figure 10 contrasts the three price baskets for fixed network broadband (each without TV) with the three price baskets for mobile broadband (with unlimited data volume). In both cases, the broadband categories differentiated are ≤30 Mbps, >30 to ≤100 Mbps, and >100 Mbps. The basket value is based on the least expensive product from each ISP that can be included in the respective basket (excluding tariffs for young persons). With higher bandwidths (>100 Mbps), mobile broadband can be seen to be more expensive than fixed broadband (prices between EUR 38.50 and EUR 55.20), with the reverse being true for lower bandwidths (≤30 Mbps; prices between EUR 20.70 and EUR 27.20). From June 2019 to March 2020 prices fell in all categories (fixed network and mobile broadband), with the biggest falls for higher bandwidths in mobile broadband (from EUR 51.30 to EUR 46.80).

FIGURE 11: QUALITY OF SERVICE TEST (RTR-NETTEST)

Quality of Service		
Web page		1/1 - Details
Unmodified content		2/2 - Details
Transparent connection		5/5 - Details
DNS		45/45 - Details
TCP ports		16/18 - Details
UDP ports		11/13 - Details
Traceroute		1/1 - Details

Source: RTR-NetTest – Open Data from quality testing

Figure 11 shows an example of a result from the RTR-NetTest quality of service test. A green light depicts a positive test result. Next to the light, the number of positive tests carried out in the given category is shown relative to the total number of tests. A precise description of the test can be found at https://www.rtr.at/en/tk/netztestfaq_qos.

Using the QoS tests, end users can determine how well they can use their internet access. A red light indicates possible restrictions with certain uses. With the test referred to above as an example, two TCP and two UDP port tests failed. The actual results of the failed tests can be viewed under ‘Details’. In this case the end user had a private IP address, which does not allow incoming connections to the user. The end user in this example would not be able to operate an online server.

Conclusions

Looking at the indicators above, it can be concluded that in essence there has been a positive development in the availability of non-discriminatory IAS in the reporting period. There is no evidence that the fluctuations occurring are related to net neutrality. What is encouraging, though, is that broadband subscriptions became less expensive in the reporting period, while download speeds improved somewhat and no significant decline in upload speeds can be recognised. Section 6 below examines in detail the specific developments in relation to the corona crisis.

06

Focus Topic:

internet during the corona crisis

The spread of the new type of coronavirus and the instigation of COVID-19 containment measures in Austria and worldwide were a significant development during the period under review. As from 15 March 2020 confinement measures came into force in Austria, which led to considerable restrictions in public life. Businesses with the technical means switched were feasible to working from home offices, as did universities and schools. The huge changes to the reality of daily life led, as expected, to changes in internet use.

6.1 **Traffic management measures in accordance with Art. 3(3) third subparagraph point (c) of the TSM Regulation**

When drafting the TSM Regulation, EU legislators considered the eventuality of network congestion in cases of emergencies, with ISPs allowed in these cases to absorb such impending network congestion through appropriate traffic management measures. A proviso was also included for such cases, namely that equivalent categories of traffic must continue to be handled equally, even in exceptional circumstances.

Art. 3(3) third subparagraph point (c) of the TSM Regulation allows for a deviation from equal treatment, in order to “prevent impending network congestion and mitigate the effects of exceptional or temporary network congestion, provided that equivalent categories of traffic are treated equally”. Where under such exceptional circumstances a higher capacity utilisation of the overall network makes it appear necessary to give higher priority for instance to video conferencing applications, based on the text of the Regulation such higher priority should be similarly given to all providers and not only to individual application providers.

RTR informed the various stakeholders about these general legal conditions shortly after the announcement of the confinement measures.³⁴ In the event that such measures were to be implemented by ISPs, RTR was to promptly, and in any case on the same day, inform them by appropriate means, including a specific description of the technical measures for traffic management, the expected impacts on services in general as well as the expected duration.

No ISP in Austria instigated such traffic management measures in accordance with this process. Despite huge network overload (see below), the infrastructure was able to withstand the changed and increased use, also due to the quick reaction of the ISPs and the creation of additional capacities on short notice.

³⁴ Press release issued on 18 March 2020, <https://www.rtr.at/de/pr/pinfo18032020> (in German)

6.2 Reporting

During the confinement period, several mechanisms were used to provide the regulatory authority and also the general public with an overview of internet status and the application of any traffic management measures. With reference to usage in Austria, RTR received regular updates on the utilisation of Austrian networks. At European level, starting a few days after the confinement measures came into force, RTR also entered the aggregated Austrian data into the BEREC reporting system.

Regular reports were subsequently published both by BEREC³⁵ and the EC³⁶ in order to provide the interested public with a status update on the internet and networks in Europe. These reports also made it possible to forecast developments during the corona crisis.

6.3 Information for consumers

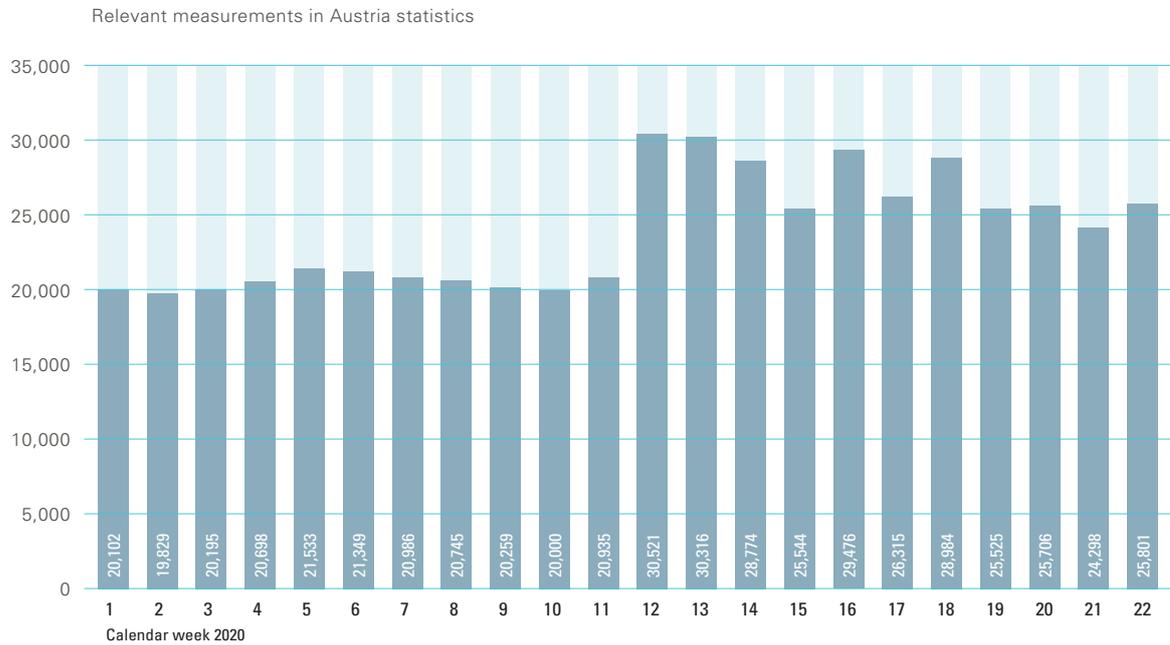
To support consumers in the best possible manner in the event of problems arising due to increased use of their own internet access, RTR published a guideline with tips for internet and telephone use during the corona crisis.³⁷ This informed consumers of the ability of Austrian networks to withstand the overload during the corona crisis, and of potential steps for improving the stability of users' internet access, for instance by a better positioning of the WLAN router and optimised timing of internet use. Consumers were also notified of the RTR-NetTest as a means of evaluating IAS during the corona crisis.

³⁵ For an example, refer to the BEREC report of 30 March 2020: https://berec.europa.eu/eng/document_register/subject_matter/berec/press_releases/9238-press-release-berec-report-on-the-status-of-internet-capacity. Additional BEREC reports are available on the BEREC website.

³⁶ European Commission 2020: Reports on the status of internet capacity during coronavirus confinement measures (<https://ec.europa.eu/digital-single-market/en/news/reports-status-internet-capacity-during-coronavirus-confinement-measures>).

³⁷ RTR 2020: Tips for internet and telephone during the corona crisis (<https://www.rtr.at/de/tk/TippsfrInternetundTelefonwhrendderCoronakrise>; in German). Similar support measures were also offered by other regulatory authorities, such as French regulator ARCEP: <https://www.arcep.fr/demarches-et-services/utilisateurs/teletravail-et-connexion-internet.html>.

FIGURE 12: USE OF THE RTR-NETTEST



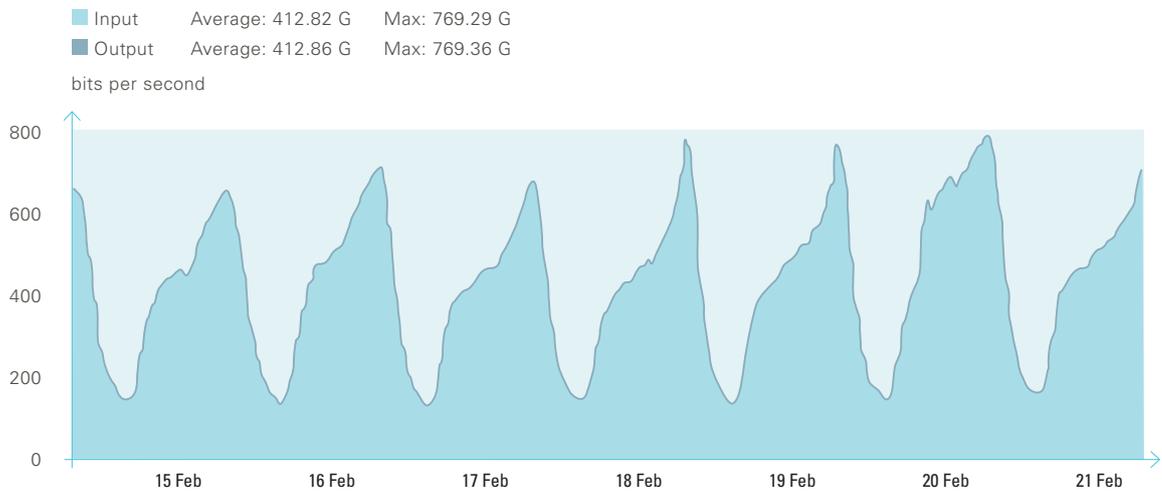
Source: RTR-NetTest

As shown in Figure 12, use of the RTR-NetTest also increased during the confinement measures. After the confinement measures came into force as of 16 March, significantly higher use was recorded, which remained the case until the end of the reporting period.

6.4 Change in usage patterns

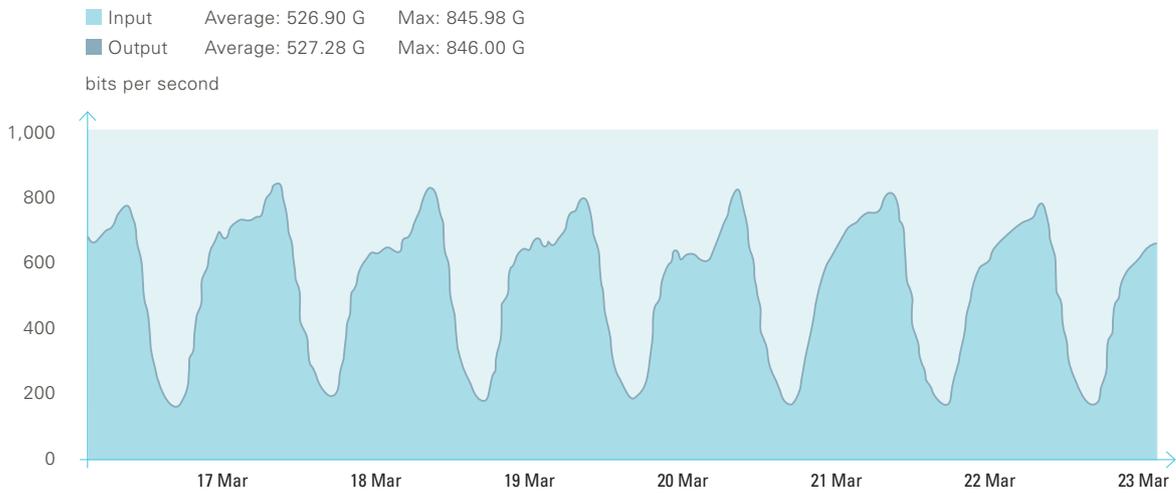
After the confinement measures came into force, a change in usage patterns in Austrian networks was observed. In the first few weeks the use of voice telephony rose sharply, in some instances tripling the normal level. An increase in data consumption during the day was also observed – in addition to the continued peak in data use in the evening.

FIGURE 13: DATA TRAFFIC STATISTICS FROM VIENNA INTERNET EXCHANGE FOR THE WEEK OF 15-21 FEBRUARY 2020



Source: Vienna University Computer Center, ACOnet and Vienna Internet eXchange, https://www.vix.at/vix_statistics.html.

FIGURE 14: DATA TRAFFIC STATISTICS FROM VIENNA INTERNET EXCHANGE FOR THE WEEK OF 17-23 MARCH 2020



Source: Vienna University Computer Center, ACOnet and Vienna Internet eXchange, https://www.vix.at/vix_statistics.html.

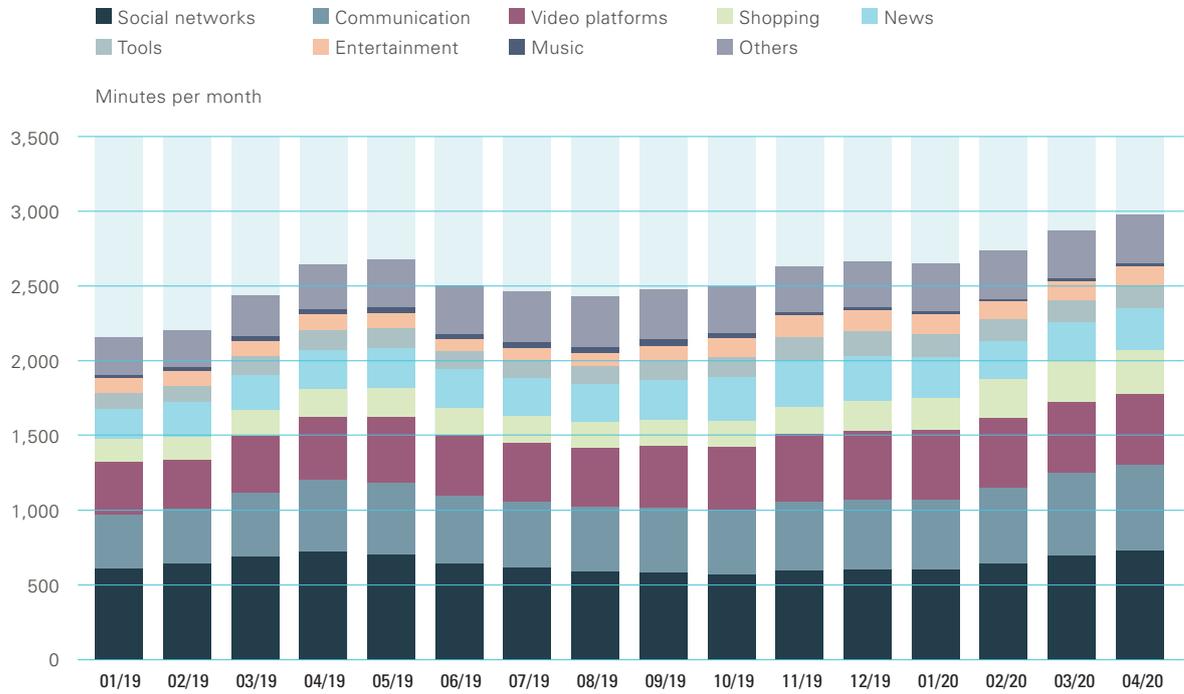
This change can be seen in the statistics³⁸ from Austria's Vienna Internet eXchange (VIX) as shown in figure 13 and figure 14. Comparing weekly use in February 2020 with March 2020, it can be seen that capacity utilisation peaks were higher in absolute numbers while the difference between the peaks and the basic daily use was less pronounced.

³⁸ VIX 2020: Data traffic statistics, https://www.vix.at/vix_statistics.html

Section 6

Focus Topic: internet during the corona crisis

FIGURE 15: AVERAGE USAGE PERIOD OF VARIOUS CATEGORIES OF APPS AND WEBSITES BY THE AUSTRIAN ONLINE POPULATION



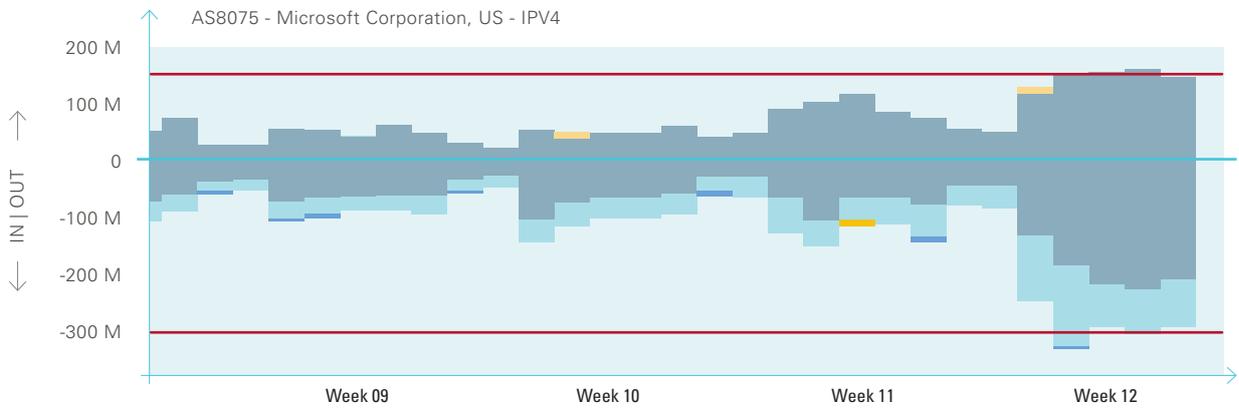
Source: Reppublika Digital Ratings³⁹

As shown in figure 15, not only did overall usage change during the corona crisis, there was also a change in the applications and services specifically used. An evaluation of the Reppublika data shows an increase in overall usage, while communication applications and social networks in particular benefited from an above-average increase in use.

³⁹ Reppublika Digital Ratings 2020, <https://www.reppublika.com/>

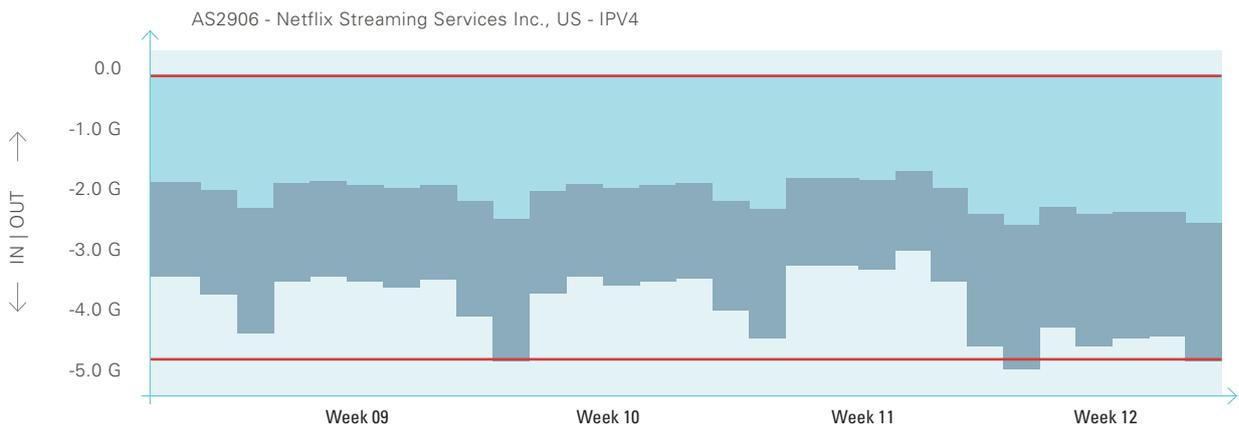
Here data on the use of apps (via smartphones) and websites (via smartphones and desktops) were collected. Categories defined by RTR; floating mean values from the preceding, current and subsequent period.

FIGURE 16: IPV4 PEERING STATISTICS WITH AS8075 FROM K-NET



Source: K-Net

FIGURE 17: IPV4 PEERING STATISTICS WITH AS2906 FROM K-NET



Source: K-Net

Other European countries also recorded changes in usage patterns. Peering statistics⁴⁰ published by K-Net, a small French internet provider, show a big increase in traffic for Microsoft⁴¹ and a smaller one also for Netflix.⁴² In addition, at the start of the confinement measures, the levels on weekdays corresponded to those at weekends (figure 16 and figure 17). This is confirmed directly by the CAPs. For example, at the end of March Microsoft reported a 775 per cent increase in use of its remote working platform Microsoft Teams and a more than 300 per cent increase in the remote desktop solution Windows Virtual Desktop.⁴³

⁴⁰ K-net 2020: Top 20 AS (24 hours) (<https://as24904.kwaoo.net/as-stats/top.php>)

⁴¹ K-net 2020: History for AS8075: Microsoft Corporation,US (<https://as24904.kwaoo.net/as-stats/history.php?as=8075>)

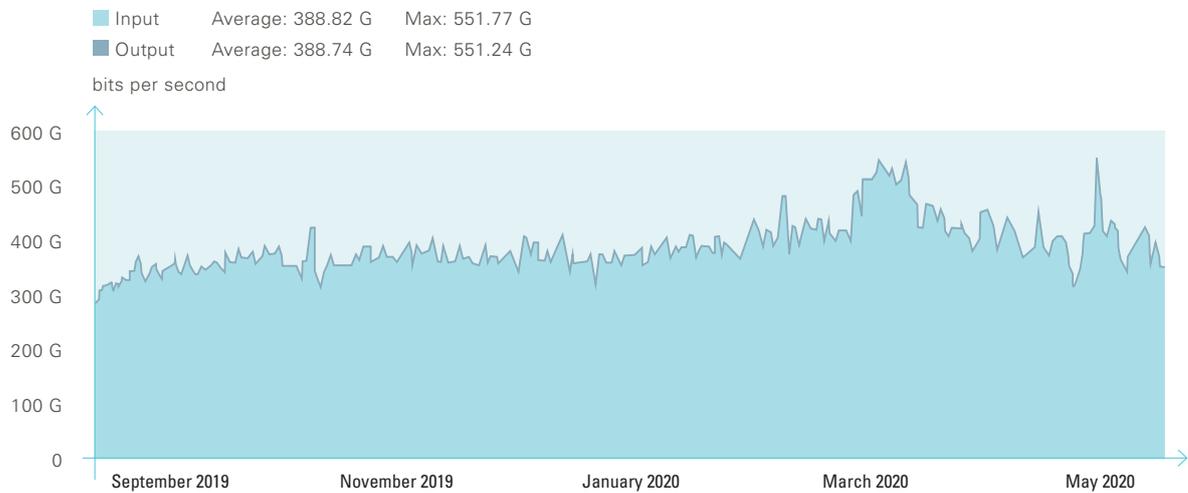
⁴² K-net 2020: History for AS2906: Netflix Streaming Services Inc., USA (<https://as24904.kwaoo.net/as-stats/history.php?as=2906>)

⁴³ Microsoft Azure 2020: Update #2 on Microsoft cloud services continuity (<https://azure.microsoft.com/en-us/blog/update-2-on-microsoft-cloud-services-continuity/>)

Similar changes in usage patterns have also been sporadically reported in Austria. For instance, one Austrian mobile telecoms provider reported at a press conference an increase of 21 percent in streaming, 173 per cent in gaming and 232 percent in video telephony during the confinement measures.⁴⁴

In response to possible network overloads, in particular due to video streaming services, the EC started discussions with streaming providers Netflix, Amazon, Apple and Disney+ in the early days of the confinement measures. As a result, the providers reduced the resolution levels or bitrates of the video streams offered in order to alleviate network loads.⁴⁵

FIGURE 18: DATA TRAFFIC STATISTICS FROM VIENNA INTERNET EXCHANGE FOR THE MONTHS OF SEPT. 2019 – MAY 2020



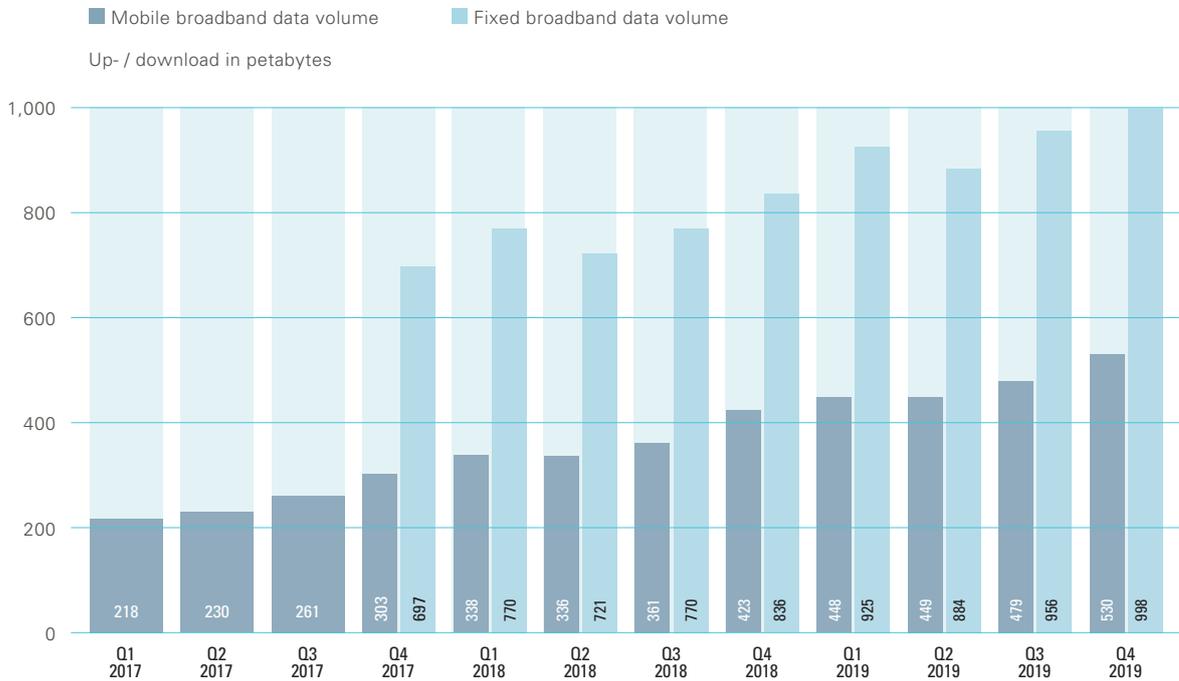
Source: Vienna University Computer Center, ACOnet and Vienna Internet eXchange, https://www.vix.at/vix_statistics.html.

During the entire period of the confinement measures there were no network outages due to overloading. According to the statistics from VIX (figure 18), after the considerable rises in the first weeks, at least in the recorded traffic, the situation again stabilised.

⁴⁴ Der Standard 2020: Mobile provider "3" reports huge rise in online gaming and video telephony (<https://www.derstandard.at/story/2000117262958/mobilfunker-3-online-gaming-und-videotelefonie>; in German)

⁴⁵ Summary: Golem.de 2020: Amazon, Disney and Netflix continue to reduce bitrates (<https://www.golem.de/news/videostreaming-amazon-disney-und-netflix-reduzieren-bitrate-weiterhin-2004-147972.html>)

FIGURE 19: FIXED AND MOBILE DATA VOLUME – RETAIL MARKET



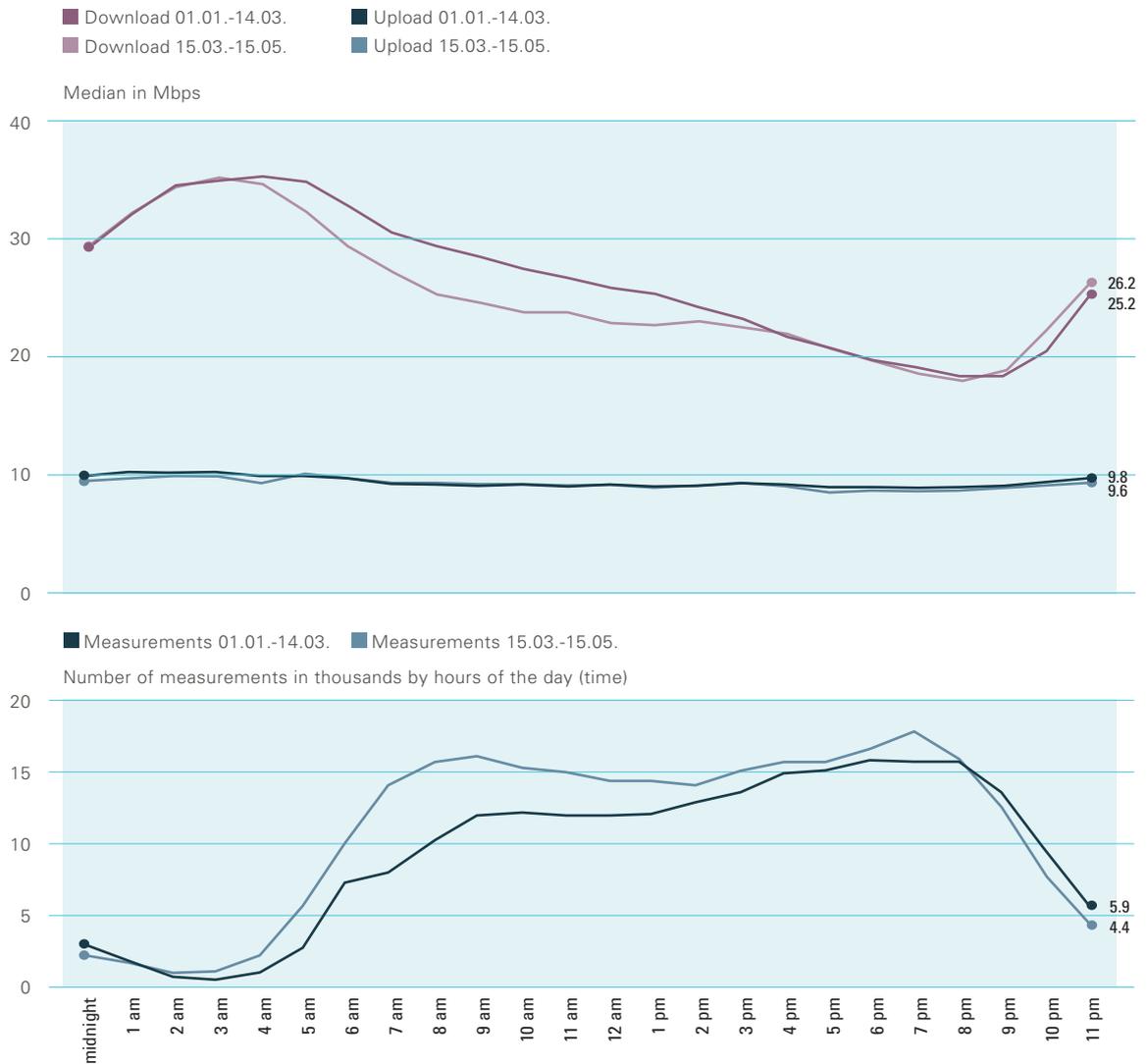
Source: RTR

Although traffic rapidly increased in the first weeks of the corona crisis, it must also be considered that traffic has been trending upwards for many years (figure 19). The level after the short-term increase is expected to soon represent a new baseline, as would have been the case even without the corona crisis. This trend has also been confirmed by the traffic statistics from various internet exchanges⁴⁶ and also by the figures published in the RTR Internet Monitor.⁴⁷ The latter shows a total mobile data volume of about 218 petabytes in Q1 2017 and of 530 petabytes in Q4 2019, representing a more than a two-fold increase less than three years later.

⁴⁶ Refer for example to the figures from the largest European internet exchange, DE-CIX (<https://www.de-cix.net/de/locations/germany/frankfurt/statistics>)

⁴⁷ RTR 2020: RTR Internet Monitor Annual Report 2019, <https://www.rtr.at/en/inf/internet-monitor-jahresbericht-2019>

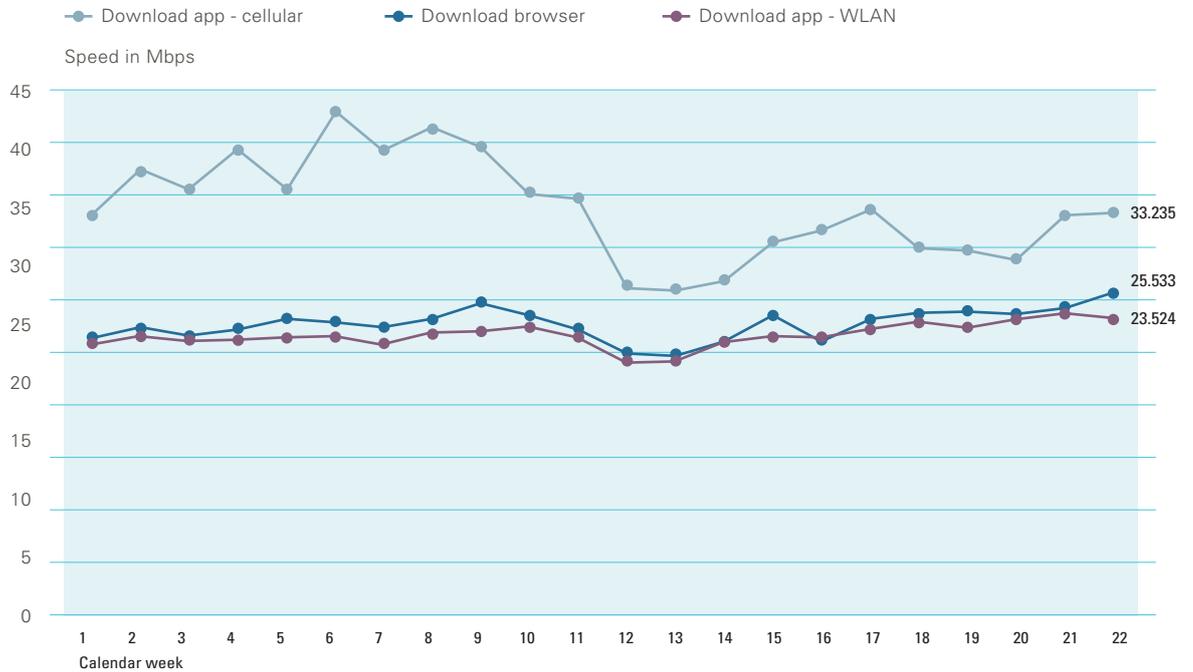
FIGURE 20: DOWNLOAD AND UPLOAD SPEEDS BY TIME OF DAY
JANUARY 2020 – MAY 2020



Source: RTR-NetTest

The measurements recorded using the RTR-NetTest also show a temporarily higher capacity utilisation during the confinement measures (figure 20). Average download speed dropped by more than 10 per cent during the day in this period, whereas transmission rates measured in the usual 'busy hours' returned values similar to those prior to the confinement measures.

FIGURE 21: MEDIAN DOWNLOAD SPEED BY MEASUREMENT TYPE



Source: RTR-NetTest

A fall in download speed was also observed in measurements performed for mobile telecommunications networks (2G, 3G, 4G) after the confinement measures came into force after 15 June (figure 21). A marginal drop was also recorded for stationary products (WLAN, browser measurements), yet less significantly pronounced. With the first relaxation of confinement measures, and after ISPs reinforced bottleneck capacities, the figures recorded corresponded to those before the crisis.

With a view to the internet, the regulatory authority considers the crisis to have been well managed (to date) overall. This can also be attributed in particular to the good communications between the authorities involved and the ISPs, and to their prompt response to the changed usage patterns as well as the creation of additional capacities on short notice.

07 Outlook

on further activities

The Austrian regulatory authority had already adopted a proactive approach to the issue of net neutrality even before the TSM Regulation entered into force. This approach, in the meantime the guiding principle of our activities, is to be retained in future. Specifically, the activities described below are currently planned for 2020/2021 or by the end of the next reporting period in April 2021.

Monitoring activities

1. **Transparency investigation.** Another investigation is planned in the coming reporting year to evaluate the transparency status in relation to transmissions (whether traffic is modified). If any corresponding evidence is identified, as in the past, requests for information and additional steps will be initiated where required.

Section 4 referred to the additional official instruments described below, which allow verification of conformity with the provisions of the TSM Regulation:

2. **Additional requests for information.** As in the previous years, a verification of internet access products in the form of a request-for-information procedure is planned for the coming reporting year. The focus this time will be mobile telecommunication products offered by service providers and other MVNOs. In addition, other verifications will be performed as needed.
3. **Customer complaints as a source of information.** Customer complaints are considered a further source of information for any breaches of the TSM Regulation provisions. Discussions are held and procedures launched in the event of any peculiarities, repeated complaints or similar developments.
4. **Ongoing review of general terms of business.** The fourth instrument relates to the powers under Art. 25 TKG 2003, according to which all general terms of business must be submitted to the regulatory authority and can also be contested by the TKK – where any provisions of Art. 4(1) of the TSM Regulation are breached. This supports the monitoring of compliance with TSM Regulation provisions. RTR will simultaneously monitor any significant issues among products that touch on net neutrality issues but are permitted in principle by the TSM Regulation; such issues include zero-rating within the data cap, development of the internet in general and proliferation of specialised services. The procedure has already been followed for existing zero-rated products for more than two years.
5. **Information from ongoing market observation.** Under the KEV,⁴⁸ the regulatory authority periodically collects information on changes in internet access markets, implemented technologies and other items, and makes this available along with analyses derived from that information (such as hedonic prices, the mobile price index and price baskets). Additionally, the continuous further development of the RTR-NetTest provides a significant instrument to measure quality and data

⁴⁸ Communications Survey Ordinance (KEV), 2004, as amended in 2012.

transmission speeds. On the whole, this provides a foundation for further RTR indicators and analyses. All of the relevant information, published in RTR's quarterly Internet Monitor and Telekom Monitor, can be downloaded as Open Data⁴⁹ by interested parties.

6. **Certified monitoring mechanism.** The regulatory authority has been offering the RTR-NetTest for several years now (www.netztest.at). This is used for evaluation purposes in conciliation procedures (as well as court proceedings) in order to ascertain whether the ISP is or has been providing a deficient service. Since the TKG amendment in November 2018, the regulatory authority has been offering a performance monitoring mechanism for end users (Art. 17b TKG 2003), which is considered a certified monitoring mechanism within the meaning of Art. 4(4) of Regulation (EU) 2015/2120.
7. **Empirical collections and analyses of platforms and digital gatekeepers.** Whereas the TSM Regulation relates to questions of open internet access, in its role as an important innovation machine and in relation to application agnostics, the internet also faces risks that originate outside internet access and the potential influence of ISPs. Accordingly, RTR compiled a study on operating systems, apps and app stores in June 2019,⁵⁰ also setting up in late 2019 a digitisation task force with the Austrian Federal Competition Authority. After publication of a paper outlining a fundamental methodology for ongoing monitoring of communications platforms, studies on browsers and search engines and on voice assistant limitations are additionally planned for the coming reporting year.

⁴⁹ See RTR's Open Data Portal, <https://data.rtr.at>

⁵⁰ RTR 2019: The open internet: OS, Apps and App Stores <https://www.rtr.at/en/inf/OffenesInternetApps2019>

International cooperation

The special significance of international cooperation in the context of net neutrality was highlighted in section Collaboration at this level will continue in the coming reporting year (05/2020 to 04/2021) with the following priority areas:⁵¹

1. A first important step was the adoption of the revised BEREC Net Neutrality Guidelines by the BEREC plenary assembly in June 2020.
2. The international exchange among regulatory authorities, aimed at a harmonious implementation of net neutrality provisions (within the framework of BEREC but also bilaterally), will continue in the form of ongoing procedures as well as the joint discussion and analysis of relevant products.
3. A BEREC report on implementing the TSM Regulation will be compiled and published towards the end of 2020. The report will be based on the national reports on net neutrality released on 30 June 2020 and on the BEREC data survey that was carried out in June 2020.⁵²
4. Work will also continue on the implementation of the BEREC Net Neutrality Measurement tool. NRAs are also to be trained in the tool, with an information sharing forum to be set up for them. The BEREC Office is also to receive support in maintaining the tool.
5. And finally, the work of other NRAs is being looked at and reviewed for its relevance for Austria, with action being taken where applicable. Other regulatory authorities are also focusing more attention on open internet restrictions not related to access, such as those caused by market power, ecosystems, API policies (also see above under “Empirical collections and analyses of platforms and digital gatekeepers”). This work will receive increased international weight and interest in the forthcoming reporting period, due to the submission of the draft Digital Services Act by the EC and planned additions to general competition law through ex ante regulation of systemic platforms. Within the framework of the BEREC Work Programme 2020, RTR is also contributing to the focus issues, namely surveys and the economic aspects of digital platforms.

⁵¹ The following details are based largely on the BEREC Work Programme 2020: https://berec.europa.eu/eng/document_register/subject_matter/berec/annual_work_programmes/891_8-berec-2020-work-programme. In the current reporting year, for the first time BEREC has also submitted an outline for the Work Programme 2021. On the issue of net neutrality, its areas of focus include the measurement tool and the compilation of a report on the implementation of the Regulation as well as the guidelines (planned for October 2021). For details see https://berec.europa.eu/eng/document_register/subject_matter/berec/annual_work_programmes/8977-outline-for-berec-work-programme-2021

⁵² BEREC Report on the implementation of Regulation (EU) 2015/2120 and BEREC Net Neutrality Guidelines.

Cooperation with ISPs

In the current reporting year, the authority primarily focused its procedures on questions of copyright law and new tariff schedules for new technologies. Contrary to expectations, there have not yet been any major discussions or procedures relating to network slicing or new types of internet products. With the award of additional 5G frequencies in summer 2020⁵³ (multiband auction for the 700, 1500 and 2100 MHz bands) and the 5G rollout, RTR is expecting these two areas to grow in relevance, yet discussions on the Digital Services Act⁵⁴ (e.g. on notice and action mechanisms in the broad sense) will also continue to dominate attention, alongside procedures arising from copyright issues. The good practice from the past, of seeking solutions to any emerging issues through an open dialogue with the sector, should be retained.

Information for the public and further considerations

To the extent such information can be made accessible to the public, the activities mentioned will either be publicised on the RTR website or – as has been done in the past – RTR plans to refer via its website to other relevant proceedings, studies, and activities by institutions in the general field of net neutrality.⁵⁵

⁵³ The first spectrum award in the 3.4–3.8 GHz band took place in early 2019. The outcome can be viewed at: <https://www.rtr.at/en/tk/5G-Auction>

⁵⁴ A summary of the related ongoing consultations with the EC as of 8 September 2020 can be viewed at: https://ec.europa.eu/info/consultations_en. The two main areas of focus of the consultation for the Digital Services Act relate to the creation of a new competition tool for major platforms and gatekeepers, as well as the consolidation of the Single Market and revision of the rules for digital services. For details, refer to: https://ec.europa.eu/commission/presscorner/detail/en/ip_20_962. The EC is planning to submit the first drafts on the basis of the consultations before the end of 2020.

⁵⁵ For details, follow these links: <https://www.rtr.at/en/tk/Netzneutralitaet> und <https://www.rtr.at/en/tk/Internationales>.

08 Appendix

Appendix 1: Mapping of the report to the structure of the guidelines

Here, as described above in the introduction, interested readers can view how this report maps to the BEREC guidelines. This is important first and foremost to allow international comparisons of the report. Par. 183 of the BEREC guidelines describes which sections should be included in national reports on net neutrality. In the following table these points are mapped to the individual chapters of the report.

TABLE 7: SECTIONS OF THIS REPORT AS MAPPED TO THE BEREC GUIDELINES

TEXT BEREC-GUIDELINES (RZ. 183)	SECTION
"overall description of the national situation regarding compliance with the Regulation"	Section 1
"description of the monitoring activities carried out by the NRA"	Section 4 and Section 5
"the number and types of complaints and infringements related to the Regulation"	Section 4 and Section 5
"main results of surveys conducted in relation to supervising and enforcing the Regulation"	Section 4
"main results and values retrieved from technical measurements and evaluations conducted in relation to supervising and enforcing the Regulation"	Section 5.3 and Section 6
"an assessment of the continued availability of non-discriminatory IAS at levels of quality that reflect advances in technology"	Section 5.3
"measures adopted/applied by NRAs pursuant to Article 5(1)"	Section 4.8

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Appendix 3: Abbreviations

BEREC:	Body of European Regulators for Electronic Communications
BOOTPS:	bootstrap protocol, serves to assign an IP address and other parameters to a computer in a TCP/IP network
BVwG:	Federal Administrative Court
CAP:	content and application provider
CDN:	content delivery network
CPE:	customer premises equipment
CreativePartnr:	service via port 455/TCP
DHCP:	dynamic host configuration protocol This protocol allows a server to assign the network configuration to clients.
DNS:	domain name system
EC:	European Commission
GDPR:	General Data Protection Regulation
HTTPS:	Hypertext Transfer Protocol Secure; communications protocol on the World Wide Web that allows data to be transferred securely
IAS:	internet access service
IP:	internet protocol
IPv4:	internet protocol version 4
IPv6:	internet protocol version 6
ISP:	internet service provider
KEV:	Communications Survey Ordinance (Kommunikations-Erhebungs-Verordnung)
KommAustria:	Austrian Communications Authority
MNO:	mobile network operator
MVNO:	mobile virtual network operator
NAT:	network address translation
NetBIOS:	Network Basic Input Output System; an application programming interface (API) for communication between two programs via a local network
NN:	net neutrality
NRA:	national regulatory authority
RTR:	Austrian Regulatory Authority for Broadcasting and Telecommunications
SSH:	Secure Shell; refers to a network protocol and corresponding program, used to securely establish an encrypted network connection with a remote device
SMB:	server message block; also known as common internet file system (CIFS), is a network protocol for file, printing and other server services in computer networks

SMTP:	simple mail transfer protocol
SNI:	see TLS-SNI
TCP:	transmission control protocol
TFTP:	trivial file transfer protocol; very simple (and early) file transfer protocol
TKG:	Telecommunications Act
TKK:	Telekom-Control-Kommission
TLS-SNI:	transport layer security – server name indication; an extension of the transport layer security protocol that allows multiple encrypted, retrievable websites with different domains to share one server on TLS port 443, even if it has only one IP address
TSM Regulation:	Telecoms Single Market Regulation; 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.
UDP:	user datagram protocol; a minimal, connectionless network protocol that is part of the transport layer of the internet protocol family
UrhG:	Federal Act on Copyright in Literary and Artistic Works and Related Rights (Urheberrechtsgesetz)
VIX:	Vienna Internet eXchange
VoD:	video on demand
WAN:	wide area network

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