TRAFICOM
Finnish Transport and Communications Agency

Annual Net Neutrality report 2019

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1 Introduction

Open internet, or net neutrality, is guaranteed by EU Regulation 2015/2120[1] (Telecoms Single Market Regulation, TSM Regulation). In Finland, compliance with the Regulation is monitored by the Finnish Transport and Communications Agency Traficom[2]. The Regulation aims to safeguard equal and non-discriminatory treatment of traffic in the provision of internet access services and to ensure users' right to open internet access. For a more detailed definition of net neutrality, please refer to chapter 2.

Based on Traficom's findings, the status of net neutrality in Finland is healthy, and internet access service providers (IASPs, operators) comply with the TSM Regulation. For a more detailed description of Traficom's actions and observations, please refer to chapters 3 to 6. Traficom has maintained active dialogue on net neutrality with the industry. An indication of successful collaboration is that Traficom only had to issue one binding supervision decision during the monitoring period. As a rule, all issues that were raised were resolved in negotiations with operators. Topical matters have included updating a net neutrality memorandum targeted at companies and in particular its guideline on users' right to a public IPv4 address, updating the opinion regarding the reasonable method of indicating the speed of internet access service, 5G, and a supervisory case concerning the freedom to choose terminal equipment.

The TSM Regulation requires national regulatory authorities to publish an annual report regarding net neutrality related monitoring activities and findings. This report must be provided to the European Commission and the Body of European Regulators for Electronic Communications (BEREC).

Under the Regulation, Traficom must in its supervisory activities take utmost account of BEREC guidelines regarding the application of net neutrality rules[3]. In line with the guidelines, this report covers the time period from 1 May 2018 to 30 April 2019. As instructed in the guidelines, the report contains an overall description of net neutrality, Traficom's monitoring activities and their main results, complaints submitted to Traficom, reported infringements, and the availability and quality development of non-discriminatory internet access services.

Traficom has not carried out any technical net neutrality measurements or imposed new technical service requirements or minimum quality requirements based on the Regulation.

This report comprises the following chapters:

- Chapter 2: Net neutrality in a nutshell
- Chapter 3: Equal treatment of traffic
- Chapter 4: User's rights
- Chapter 5: Net neutrality measurement tool

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2015:310:FULL&from=EN

[2] The Finnish Transport and Communications Agency Traficom was formed on 1 January 2019 as a merger of the Finnish Transport Safety Agency (Trafi), the Finnish Communications Regulatory Authority (FICORA) and parts of the Finnish Transport Agency. This report refers to Traficom even when the text concerns measures taken in 2018 by the Finnish Communications Regulatory Authority, one of Traficom's predecessors.

[3] http://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/guidelines/6160-berec-guidelines-on-the-implementation-by-national-regulators-of-european-net-neutrality-rules

- Chapter 6: Using the word ‘unlimited’ in contract terms
- Chapter 7: Trends in internet access services
- Chapter 8: Stakeholder cooperation and other operations

2 Net neutrality in a nutshell

Under the EU TSM Regulation, users of internet access services have the right to access and distribute information and content, and to use and provide applications and services of their choice. Users have this right irrespective of the origin or destination of the information. This principle is also called net neutrality.

End users and IASPs are still free to agree on the features of internet access services, such as speed, included data volumes or price. However, such agreements may not limit users’ rights to open internet access.

Net neutrality also means that users have the freedom to use the terminal equipment (such as a phone or modem) of their choice, but the terminal equipment must meet the technical requirements imposed by operators.

2.1 Equal treatment of traffic as a starting point

The principle of net neutrality requires operators to treat all internet traffic equally. For instance, operators may not usually restrict traffic to certain internet addresses or impose restrictions on certain types of traffic. Operators may, however, offer subscriptions with different levels of quality and implement reasonable traffic management measures. These measures contribute to an efficient use of network resources and help optimise the overall quality of internet services.

As an exception, operators may restrict internet traffic as necessary in order to

a) comply with legislation, or decisions by courts or public authorities

b) preserve the security of the network and terminal equipment

c) prevent network congestion and mitigate the effects of exceptional or temporary congestion.

Operators may take reasonable traffic management measures. In order to be deemed reasonable, such measures must be transparent, non-discriminatory and proportionate, and they must not be based on commercial considerations but on objectively different technical quality of service requirements of specific categories of traffic.

Furthermore, operators are free to offer services in their network that are optimised for specific content, applications or services requiring a higher level of connection quality than provided by ordinary internet access services. Services requiring optimisation may include telephone services in the mobile network (e.g. VoLTE), television services provided by operators over broadband (IPTV), or access to the critical systems of industry or airports. However, all subscribers to internet access services must be treated equally, without discrimination. Operators may offer optimised services only if it does not impair the general quality of internet access services.

2.2 Terms of contract and net neutrality

Net neutrality also means that operators must provide clear and comprehensible information about the characteristics of different subscriptions in their contracts and on their websites. Customers must be informed of, for example, the following:

- the speed of the internet access service as required by the TSM Regulation
- how data quotas, speed or other quality factors may in practice affect the internet access service and the use of different contents, applications and services, in particular
- how traffic management measures applied by the operator may affect the quality of the internet connection
- how ordered services that require optimisation (such as the above-mentioned IPTV) affect the internet access service, including its speed.

3 Equal treatment of traffic

3.1 Interpretation of capacity allocation and prioritisation in network slicing

At the end on 2018, Traficom engaged in preliminary discussions with an operator about whether the TSM Regulation allows the allocation of network resources by network slicing. After consulting other BEREC member states, Traficom issued a guideline stating that net neutrality rules do not in principle prevent the slicing of networks and network resources for different purposes or making the unused capacity of a slice secondarily available to other slices. According to Traficom, a part of network capacity can thus be reserved for, for example, Fixed Wireless Access (FWA), and networks may be sliced for different purposes, such as allocating resources for FWA and mobile access.

3.2 Traficom's opinion on the allocation of frequency resources for mobile broadband access within the framework of net neutrality rules

Towards the end of the previous monitoring period, Traficom issued an opinion[4] on the allocation of frequency resources for mobile broadband access. According to the opinion, telecommunications operators may not provide prioritised internet access, such as the prioritised mobile broadband subscriptions previously offered to corporate customers, without a justification based on the TSM Regulation.

However, limiting maximum speed according to the agreed speed class is allowed, and so is radio resource allocation in mobile networks, where subscribers are assigned different amounts of radio resources in the network depending on speed class.

This means that a telecommunications operator can assign different QCI classes based on speed class, in which case the speed class differences are apparent even during regular congestion. When allocating frequency resources for different speed classes, the difference between the specified weighting coefficients may not exceed the difference between the maximum speeds of different speed classes.

[4] https://www.traficom.fi/sites/default/files/media/regulation/Opinion-regarding-the-allocation-of-frequency-resources-among-mobile-broadband-subscriptions-within-the-framework-of-the-net-neutrality-regulations.pdf, published 10 April 2018.

According to data gathered by Traficom, operators have complied with the guideline issued in the opinion, and no application issues have been identified during the current monitoring period.

3.3 Recommendation on filtering traffic to certain communications ports

During the previous monitoring period, in February 2018, Traficom updated its recommendation[5] on filtering traffic to certain communications ports. The recommendation addresses both existing and previous recommendations regarding filtering and limiting traffic to certain communications ports. In addition, the recommendation describes the procedure by which Traficom issues further filtering recommendations or recommends to discontinue filtering. Traficom has regularly examined the contents of the recommendation with its stakeholders and no grounds for updating it were identified during the period under review.

Valid filtering recommendations:

- Port 25 TCP UL Blocking traffic in consumer connections via servers that are not designated for outbound SMTP traffic by the network operator (see Regulation 67)
- Port 53 UDP DL Blocking traffic in consumer connections
- Port 123 UDP DL Restricting traffic in consumer connections by methods that do not prevent standard use of NTP client software or server maintenance (e.g. filtering of NTP control mode packets or rate-limiting filtering)
- Port 1900 UDP DL Blocking traffic in all connections
- Port 7547 TCP UL and DL Blocking traffic in all connections

Each operator makes, however, decisions concerning the application of the recommendation independently, and is individually responsible for meeting its information security obligations. If necessary, operators may also be required to implement additional filters to those referred to in the recommendation.

According to Traficom, operators have complied with the recommendation well; therefore, there has so far been no reason to amend the recommendation. It has also been considered unnecessary to lay down provisions on the matters covered by the recommendation in the more binding form of a regulation.

3.4 University as a service provider

In February 2018, a customer contacted Traficom asking it to assess the role of a Finnish university as an IASP. Traficom was also asked to assess whether the university has, under national legislation and the TSM Regulation, a right to block certain ports and to monitor and restrict traffic based on its terms of use.

Traficom investigated the matter with the university during the spring 2018. Based on the information obtained, Traficom concluded that the university was only providing internet access services to a limited group of users and could not be considered a telecommunications operator. Therefore, the university's activities fall outside the scope of the TSM Regulation, and Traficom could not continue to further investigate the matter.

[5] The recommendation is available at https://www.traficom.fi/sites/default/files/media/regulation/Recommendation-312-A-2018-S.pdf

4 User's rights

4.1 User's right to a public IPv4 address

On 18 October 2018, Traficom updated its checklist[6] helping operators take into account the requirements of the TSM Regulation. As a new element, the updated memorandum issued guidelines on users' right to a public IPv4 address when network address translation (NAT) is used.

According to the memorandum, the contract must state whether the internet access service provides IPv6 support. If the internet access service uses NAT, the contract must state in a comprehensible manner how this may affect the use of different services via the internet access service, including using the access to provide services. The contract must clearly indicate whether NAT is used and, if the internet access service also provides IPv6 support, whether the NAT only applies to IPv4 traffic. If NAT is used, the user must be able to obtain upon request a static or dynamic IPv4 address without separate charge. Users must be informed of this opportunity.

Traficom received a few contacts from its stakeholders regarding this guideline. The contacts concerned requirements on productisation and the regulation of prices. Traficom issued a response in February 2019, noting that the guideline in the memorandum is based on Article 3(1) and (2) of the TSM Regulation. As the checklist indicates, according to Article 3(1) of the TSM Regulation the end-user has, for example, the right to use and provide the applications and services of their choice via their internet access service.

According to Article 3(2), the user rights referred to in Article 3(1) cannot be restricted by contracts or commercial practices between the parties. Because NAT in practice restricts the end-user's right to provide services under Article 3(1) of the TSM Regulation, Traficom considers the use of NAT a prohibited restriction. Thus, operators cannot refuse to remove such an unlawful block at the user's request or charge a fee for the operation. Traficom is currently unaware of any other means to lift the restriction caused by NAT than to provide the customer with a public IPv4 address.

Traficom has not received any other contacts regarding the matter from stakeholders or users since it issued its response. Traficom will nonetheless continue to monitor the situation as part of its overall monitoring and supervision activities.

4.2 Freedom to choose terminal equipment

During the current monitoring period, Traficom has also investigated a customer complaint case where an operator only allowed cable modems pre-approved by the operator to be connected to its cable network. In the case, Traficom had to assess the operator's right to prohibit a user from using the terminal equipment of their choice and the operator's right to predetermine the devices it allows users to connect to its network.

Under Article 3(1) of the TSM Regulation, end-users have the right to use the terminal equipment of their choice. The same right is guaranteed to users under section 246, subsection 1 of the Act on Electronic Communications Services (917/2014), which states that a telecommunications operator shall not prevent a user from connecting to a public communications network any radio or telecommunications terminal equipment that meets the requirements of the Act. According to subsection 3, a subscriber must maintain equipment or a system to

[6] https://www.traficom.fi/sites/default/files/media/file/Check-list-regarding-the-EU-Net-Neutrality.pdf

be connected to a public communications network in accordance with instructions from the telecommunications operator so as not to endanger the information security of the public communications network or service.

Traficom interprets these provisions to mean that, for example, a cable network operator may not restrict the cable modems allowed in its network to models it has pre-approved. Terminal equipment may, nonetheless, be subject to requirements based on the communications network's interface and characteristics, for example.

If a piece of equipment compromises information security, measures can be taken in accordance with section 273 of the Act on Electronic Communications Services.

Based on the above grounds, Traficom concluded in its decision that the operator had violated national legislation and the TSM Regulation by prohibiting the user from using a cable modem that meets the requirements laid down by law without legal grounds for the prohibition. Moreover, Traficom considered that the operator cannot prohibit in advance the connection to its network of equipment other than those devices it has pre-approved. The operator changed its practices to comply with the decision.

5 Net neutrality measurement tool

Traficom has launched a project to develop an application for measuring the speed and quality of internet connections. The work is based on an on-going BEREC project to develop a European measurement tool. BEREC is responsible for creating a reference application that member states can use to develop national applications. Traficom aims to provide users with an easy-to-use measurement application with which they can easily and reliably verify the quality of their internet connection. Traficom wants to involve stakeholders in the design and development of the application from the outset. It will organise the first workshops open to all interested parties in the autumn of 2019. The actual development phase can be started once BEREC has finished its work. The Traficom measurement application is estimated to be published in late 2020.

6 Using the word 'unlimited' in contract terms

In 2018, Traficom received several contacts about an operator describing a product in its terms of contract as 'unlimited' but, at the same time, imposing or reserving the right to impose restrictions on the product in terms of calls, text messages and/or data use.

Because of these contacts, Traficom sent a letter to all major operators and two interest groups, asking them to pay special attention to legal requirements on the clarity of contract terms and the quality and features of services. The letter included, for example, the following remarks:

- Under section 107 of the Act on Electronic Communications Services, agreement terms must be worded in clear and understandable language. Under section 108 of the Act, the agreement must specify, among other things, the quality and features of the services provided.
- According to Traficom, even unlimited access does not have to available for just any purpose. At least obvious cases of misuse can be prohibited in the terms of contract, if this is done in a clear manner. Users must be able to know in which situations the use of an 'unlimited' subscription could be limited.
- In terms of restrictions, particular focus must be given to any data caps or other data transfer restrictions and on informing users about them and their impacts.

- Traficom reminds operators that according to Article 4(1) of the TSM Regulation, providers of internet access services must ensure that any contract which includes internet access services specifies at least a clear and comprehensible explanation as to how any volume limitation, speed and other quality of service parameters may in practice have an impact on internet access services, and in particular on the use of content, applications and services.

- If volume limitations or quotas are set on the transfer of data, Traficom requires in its opinion that the contract must specify the data transfer speed after the limitation.

7 Trends in internet access services

Under the TSM Regulation, Traficom must promote the continued availability of non-discriminatory internet access services at levels of quality that reflect advances in technology. Non-discrimination is at a high level in Finland, as can be seen in chapters 3, 4 and 6.

7.1 Mobile network

Mobile broadband subscriptions started to rapidly gain in popularity in Finland during 2007. Since then, we have seen fast growth in subscriber numbers and few restrictions on data transfer volumes. At the end of 2018, 74 per cent of mobile data subscriptions had unlimited data in domestic networks. Currently, there are enough unlimited data plans for as many as 1.2 million Finns, up by 6 per cent from the previous year.

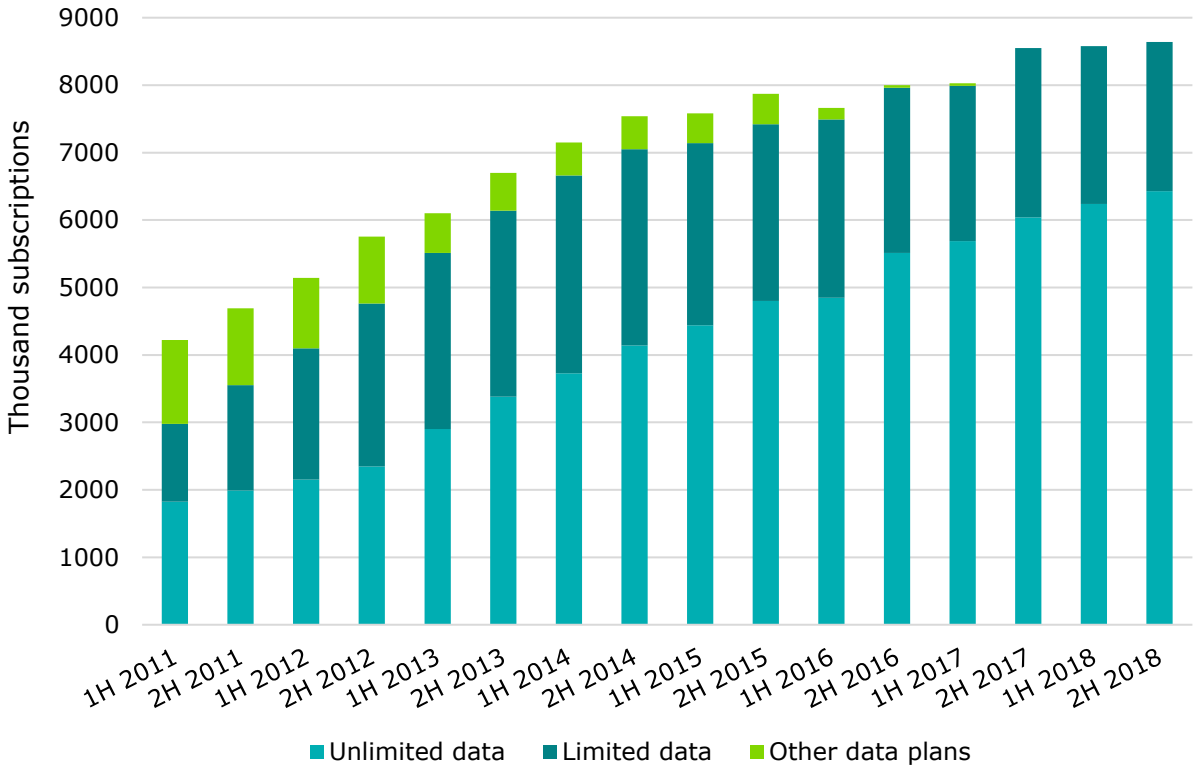

Figure 1. Mobile data transfer subscriptions

The lack of volume limitations is reflected in higher-than-average data volumes in international comparison. In the second half of 2018, almost 32 GB of data was transferred per Finn per month. Data-only subscribers (mobile broadband subscriptions) transferred an average of 43 GB of data per month. Subscribers of voice and data transferred 13 GB of data in the same period.

Because of the lack of data limitations, zero rating does not exist in Finland.

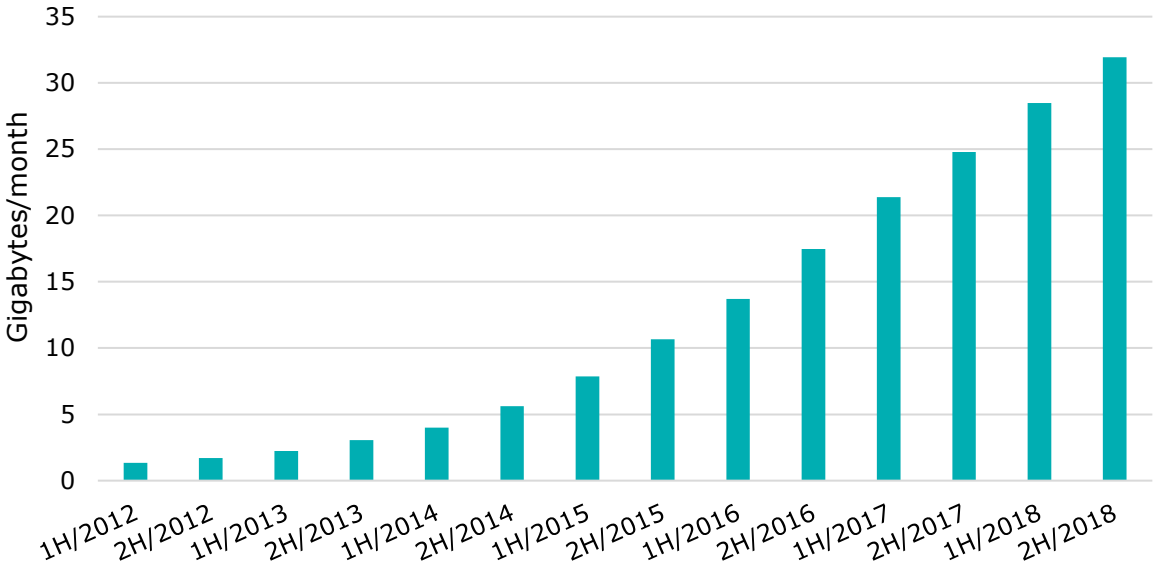

Figure 2. Volume of data transferred in mobile networks per person in Finland

7.2 Fixed network

The total number of fixed-line subscriptions has seen rather moderate development, but download speeds in particular have increased consistently. At the end of 2018, 36 per cent of fixed broadband subscriptions offered a download speed of 100 Mbps or more, while 93 per cent had a minimum download speed of 10 Mbps.

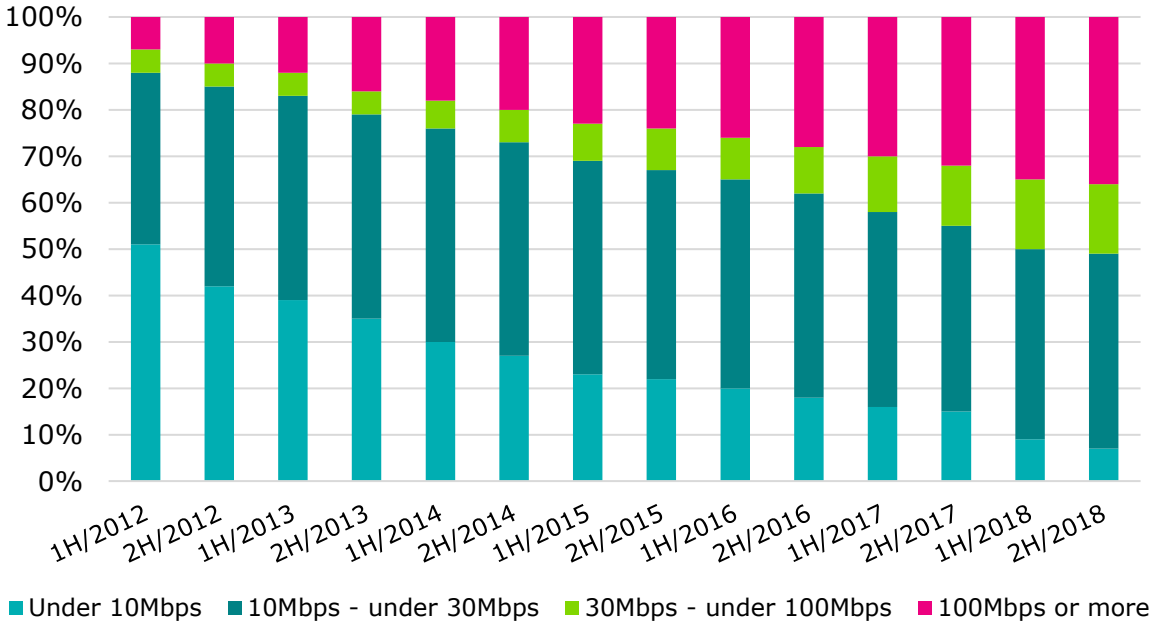

Figure 3. Fixed-line broadband subscriptions by connection speed

At the end of 2018, around 2 million households in Finland had access to fixed broadband with download speed of 30 Mbps or more. This represents 73 per cent of all Finnish households.

Around 1.6 million households in Finland had access to fixed broadband of 100 Mbps at the end of 2018. This represents roughly 58 per cent of all Finnish households. 35 per cent of households were covered by a 1 Gbps network.

The availability of fast fixed access is thus growing steadily with increasing demand, and the subscriptions on offer do not include pre-set data volume limitations.

Please note that the above figures represent download speeds and the corresponding upload speeds are significantly lower. Upload speeds will become more significant as cloud services and bidirectional streaming gain in popularity.

8 Stakeholder cooperation and other activities

Traficom met with several industry operators during the year. Talks were held with operators, a university, service providers and device manufacturers alike. Traficom has also discussed the topic in a few presentations at stakeholder events and in interviews given to various media. During the year, topical themes have included, in particular, the impacts of net neutrality legislation on 5G services, and Traficom has actively disseminated information on the matter, for example via the 5G Momentum project. Traficom has also actively participated in the activities of BEREC's Open Internet working group, and continued its discussion with the Finnish Federation for Communications and Teleinformatics (FiCom) on the net neutrality terms included in the General Terms and Conditions for Consumers, but this work is still ongoing.

In late 2018, Traficom published updated versions of its opinion regarding the reasonable method of indicating the speed of internet access service and memorandum for operators on taking into account net neutrality legislation. The opinion was updated in terms of Gbps connections by adding a section on the allocation of radio frequency resources for connections with different maximum speeds. The memorandum, on the other hand, was revised by making the text on port filtering more precise and adding a reference to the recommendation on filtering traffic to certain communications ports. New sections were also added on the freedom to choose terminal equipment, differences in the treatment of connections with different maximum speeds in the allocation of frequency resources (similar to the opinion regarding the reasonable method of indicating the speed of internet access service) and a user's right to a public IPv4 address.