



Annual Net Neutrality Report 2018

Publication 002/2018 J of the Finnish Communications
Regulatory Authority (FICORA)

Content

1	Introduction	2
2	Net neutrality in a nutshell	3
2.1	Equal treatment of traffic as a starting point.....	3
2.2	Rules on contractual terms supplement the principle of net neutrality	3
3	Equal treatment of traffic	4
3.1	Port blocking	4
3.2	5G	5
3.3	Prioritisation in mobile networks	6
3.4	Other supervisory cases.....	7
4	Terms of agreement and indication of access speed	7
5	Trends in internet access services	8
6	Stakeholder cooperation and other operations	11

1 Introduction

Open internet, or net neutrality, is guaranteed by EU Regulation 2015/2120¹. The Finnish Communications Regulatory Authority (FICORA) monitors compliance with the regulation in Finland. 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.

According to FICORA's findings, the status of net neutrality in Finland is healthy, and internet access service providers (IASPs, operators) comply with the regulation. For a more detailed description of FICORA's actions and observations, please refer to chapters 3 to 5. FICORA has maintained active dialogue on net neutrality with the industry. An indication of successful collaboration is that FICORA has not had to issue a single binding supervision decision, and all issues that were raised were resolved in negotiations with operators. Topical matters included changes in US legislation, 5G, traffic prioritisation and traffic filtering to certain communications ports.

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

The net neutrality regulation stipulates that FICORA must take utmost account of BEREC guidelines regarding the application² of net neutrality rules in its supervisory activities. In line with the BEREC guidelines, this report covers the time period May 1, 2017 to April 30, 2018. As instructed in the guidelines, the report contains a general description of net neutrality, monitoring measures and key observations, complaints filed to FICORA, reported incidents, and the availability and quality development of non-discriminating internet access services.

FICORA has not carried out any technical net neutrality measurements or imposed new regulation-based technical service requirements or minimum quality requirements.

This report comprises the following chapters:

- Chapter 2: Net neutrality in a nutshell
- Chapter 3: Equal treatment of traffic
- Chapter 4: Terms of agreement and access speed
- Chapter 5: Trends in internet access services
- Chapter 6: Stakeholder cooperation and other activities

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

² 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

2 Net neutrality in a nutshell

Under the EU 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 a modem) of their choice. However, the terminal equipment must meet the technical requirements imposed by the 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. However, operators may apply reasonable traffic management measures. These measures contribute to an efficient use of network resources and to an optimisation of 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 existing congestion if it is exceptional or temporary in nature.

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) and television services provided by operators over broadband (IPTV). 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 Rules on contractual terms supplement the principle of net neutrality

Net neutrality also means that operators must provide clear and comprehensible information about the characteristics of different services in

their agreements and on their websites. Customers must be informed, for example,

- of the speed of the internet access service as required by the regulation (see Chapter 4);
- 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 operators may affect the quality of the internet connection;
- how ordered services that require optimisation (such as above-mentioned IPTV) affect the internet access service, including its speed.

3 Equal treatment of traffic

The principle of net neutrality requires operators to treat all internet traffic equally. Any deviation from this principle should constitute an exception laid down in the regulation. The grounds for exceptions are described briefly in chapter 2.1.

During the course of the year, FICORA has met with sector actors in order to increase regulatory awareness and to assist operators in ensuring that their new services meet the applicable legislation. Hot topics in 2017 were, in particular, port blocking, 5G and subscriber prioritisation in mobile networks. These will be discussed in more detail in chapters 3.1, 3.2 and 3.3. Other supervisory cases are examined in chapter 3.4.

Furthermore, FICORA has addressed problems related to equal treatment of traffic. After the discussions, operators have, however, taken measures on their own initiative to ensure compliance, and FICORA has not had to oblige them to do so by a decision.

3.1 Port blocking

Following on from the surveys carried out in 2016 and 2017, FICORA published a recommendation³ in August 2017 concerning port filtering, and updated it in February 2018. The recommendation addresses both existing and previous recommendations regarding filtering and limiting traffic to certain communications ports. The aim is to provide easy one-stop access to up-to-date recommendations. In addition, the recommendation describes the procedure by which FICORA issues further filtering recommendations or recommends to discontinue filtering.

³ FICORA [recommendation 312 A/2018](#) Filtering traffic in telecommunications operators' networks to certain communications ports for information security reasons

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 (cf. 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. In addition, operators may be required to implement additional filters to those referred to in the recommendation.

In October 2017, FICORA issued a new version of its data request concerning internet access service port restrictions, and requested that all operators list all their effective port restrictions and specify individually for each restriction which derogation in the Regulation the restriction is based on, and why they consider it necessary to implement a restriction to meet the objective of the derogation.

FICORA analysed the responses it got and sent the operators a new letter listing allowed port restrictions in January 2018. FICORA asked the operators to provide an account of all the actions they had taken on account of the letter, specifying whether they had removed all those port filters that the letter did not mention. Alternatively, the operators could explain why they had continued to apply certain port filters and why they considered them to be necessary. FICORA asked the operators to submit their responses by February 2, 2018.

FICORA analysed the results and contacted all the operators that had listed port filtering procedures that differed from the recommendation and had not provided sufficient grounds for them. On the basis of the letter and the subsequent communication, the above operators removed all the port filters that were not necessary for data security reasons. According to FICORA's evaluation, these operators are now all compliant with the Regulation.

3.2 5G

The topic of 5G was raised already during the preparations of the regulation and during the drafting of the BEREC guidelines for the application of the regulation. This dialogue has continued, and the year 2018 has seen a number of new concrete examples of 5G applications. In addition, FICORA has held meetings with operators and device manufacturers on the topic of 5G, and been presented with a number of questions.

In April 2018, TNO, an independent research organisation, published its study⁴ on the impacts of net neutrality legislation on the progress of 5G. The research was funded by a group with representation from public organisations, operators and device manufacturers, and can thus be considered as an independent study.

The study examined a few use cases from the viewpoint of implementability and possible challenges. These use cases were virtual reality in media and entertainment, automated driving and critical communications in public safety. The study concluded that net neutrality legislation did not create an advance barrier to the development and deployment of 5G networks and technology. TNO also pointed out that it was impossible to give a single encompassing answer, because there are right and wrong ways of using a technology. Also the BEREC Net Neutrality Expert Working Group had addressed the matter and agrees.

As stated, legislation does not prevent the introduction of 5G concepts. These include network slicing, edge computing and quality assurance. In this respect, net neutrality legislation is technology neutral, and better quality can be offered, provided that the requirements laid down in the regulation are met. BEREC is planning to elaborate on its view in a separate statement later on.

In addition, FICORA has met with and continues to meet with operators on the matter. FICORA strives to diminish uncertainty experienced by operators by providing clarification on the application of legislation either on a general level or by taking a stand on individual concrete cases. FICORA will also actively present topics for the consideration of the BEREC Net Neutrality Expert Working Group to encourage shared interpretations.

All in all, 5G is not as major a transition as 4G was. It is at least FICORA's view that the rules are relatively easily applicable to 5G. In fact, 5G provides better tools for ensuring that all the quality requirements of different services are met in accordance with the regulation.

3.3 Prioritisation in mobile networks

During 2017, FICORA was contacted a handful of times regarding prioritisation in mobile networks. A service provider was offering prioritised mobile broadband services at a fixed location. FICORA deemed this to be in breach of the net neutrality regulation, and started negotiating with the operator. The operator discontinued the sales of the said product. The premise of the regulation is that one internet access service must not be prioritised over another. FICORA was also interviewed in the media on several occasions regarding the matter.

FICORA was also contacted with regard to another internet access service provider's unequal allocation of frequency resources for services with different maximum speeds. FICORA evaluated the case from the viewpoint of net neutrality, and took the matter for consideration to the BEREC Net Neutrality Expert Working Group. FICORA concluded that on certain

⁴ TNO 2018 R10394, [5G and Net Neutrality: a functional analysis to feed the policy discussion](#)

conditions, such actions do comply with the net neutrality regulation, and published the conditions in an opinion⁵ after consulting with the industry.

In practice, FICORA's opinion allows mobile broadband connections with higher maximum speeds to work better than slower ones also during congestion. The other side of the coin is that this means that slower connections will slow down more at times of network congestion. Operators' terms of contract must therefore clearly and comprehensibly state the practical impact of traffic management at the radio interface on the available speed, because the procedure may significantly impact the available speed during congestion.

Moreover, FICORA has been in talks with different operators planning to launch a service requiring optimisation on the prioritisation of such services. FICORA stated that, in principle, prioritisation is possible in cases where an internet access service requires better than average quality. This may be the case for example when a service requires minimal delays or when access to a service, in other words its reliability, is critical. FICORA is, therefore, of the opinion that the regulation does not prevent the launch of new services. To ensure unanimous interpretations of the regulation, FICORA has actively presented cases for the consideration of the BEREC Net Neutrality Expert Working Group.

3.4 Other supervisory cases

Also a couple of other net neutrality related complaints were submitted to FICORA during the year. In the first case, an internet service provider was offering free WLAN access on the condition that it could display ads alongside with online content. FICORA concluded that such a practice was in breach of the net neutrality regulation. The ISP discontinued its ad practice after it was contacted by FICORA.

FICORA also processed a case where an operator only allowed modems in its network that the operator had pre-approved. After discussions with FICORA, the operator changed its practices and allowed all modems that met certain technical requirements to access its network.

Further, FICORA was contacted with regard to media content filtering by operators. The regulation only applies to internet access services; it does not govern the way terminal devices, company internal networks or internet services process traffic.

4 Terms of agreement and indication of access speed

Agreements must state the maximum speed, minimum speed and normal speed of fixed broadband connections and the estimated maximum speed of mobile broadband connections. Moreover, advertised speed must be indicated. On September 13, 2016,⁶ FICORA published a new version of its

⁵ FICORA's [opinion](#) on the allocation of frequency resources for mobile broadband access within the framework of net neutrality rules (in Finnish)

⁶

https://www.traficom.fi/sites/default/files/media/regulation/EN_Nopeuskannanotto_p%C3%A4ivitettu_versio_2018.pdf

opinion regarding the reasonable method of indicating the speed of an internet access service.

According to the opinion, the minimum speed for fixed broadband must be at least 70 per cent of the maximum speed in connections of max 100 Mbps. The indicated maximum speed must be such that users can expect to reach it at least occasionally. The normally available speed should be in fair and reasonable proportion to the maximum speed. The availability of the normally available speed during a specific period of time must be indicated in the contract. FICORA recommends that the normally available speed of fixed connections with a maximum speed of 100 Mbps be specified as 90% of the maximum speed so that it is achieved 90% of the time during each four-hour period. In mobile connections, it must be realistically possible to reach the estimated maximum speed in actual use conditions. Therefore, the maximum speed cannot be the theoretical maximum speed indicated for the subscription. The maximum speed cannot be lower than the advertised speed.

In addition to speed, FICORA has stated the minimum requirements for how the speed of an internet access service must be expressed in the case of Gbps connections. When necessary because of the technical limitations of the network equipment, the maximum speed of Gbps connections can be indicated based on the link layer (L2). Otherwise, speed must be indicated on the basis of either IP packet payload or transport layer protocol payload. The opinion will be updated accordingly.

Moreover, FICORA has provided requirements for indicating the speeds of so-called hybrid connections (that use both fixed and mobile technology). Minimum, normal and maximum speeds must be indicated also for hybrids, but requirements for advertised speed were not given. However, the normal speed of a hybrid must not be lower than the minimum speed. The opinion will be updated accordingly.

FICORA has analysed the contractual terms of major internet access service providers in Finland and succeeded in bringing the terms in line with the net neutrality regulation and FICORA's guidelines. As regards net neutrality terms in the General Terms and Conditions for Consumers negotiated by the Finnish Federation for Communications and Teleinformatics (FiCom), the negotiations are still ongoing.

5 Trends in internet access services

Under the regulation, FICORA must promote the availability of high-quality non-discriminatory internet access services. Non-discrimination is at a high level in Finland, as can be seen in chapters 3 and 4.

Mobile broadband subscriptions started to rapidly gain popularity 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 2017, already almost 70 per cent of mobile data subscriptions had unlimited data. Currently, there are 1.1 unlimited data plans per user, up 10 per cent from the previous year.

The lack of volume limitations was reflected in higher-than-average data volumes in international comparison. In the latter half of 2017, almost 26

Gbps of data was transferred per Finn per month. Data-only subscribers transferred an average of 36 Gbps of data per month.

For these reasons, zero rating does not exist in Finland.

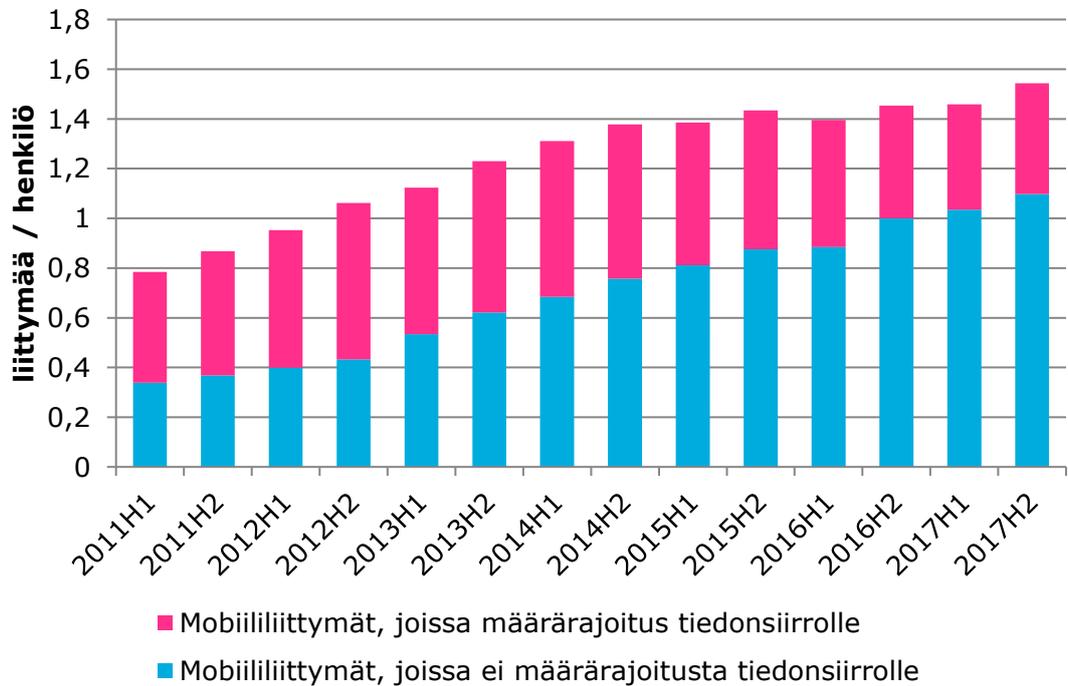


Figure 1. Mobile data transfer subscriptions per person

The total number of fixed-line telephone subscriptions has seen rather moderate development, but connection speeds have increased consistently. At the end of 2017, 32 per cent of fixed broadband subscriptions offered a transfer speed of 100 Mbps or more, while 85 per cent had a minimum transfer speed of 10 Mbps.

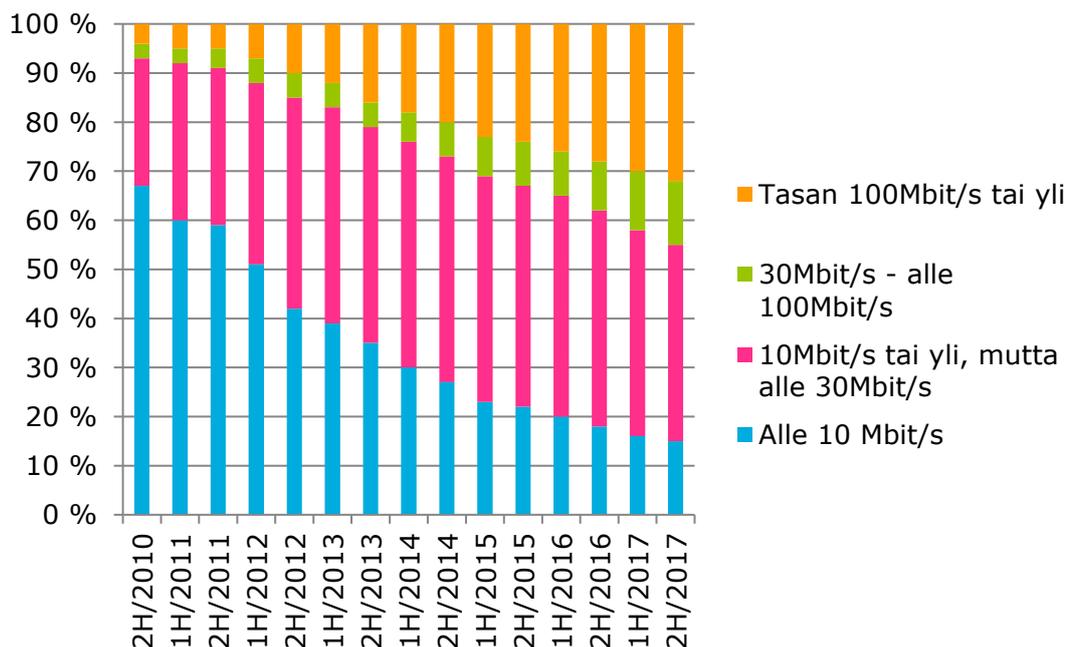
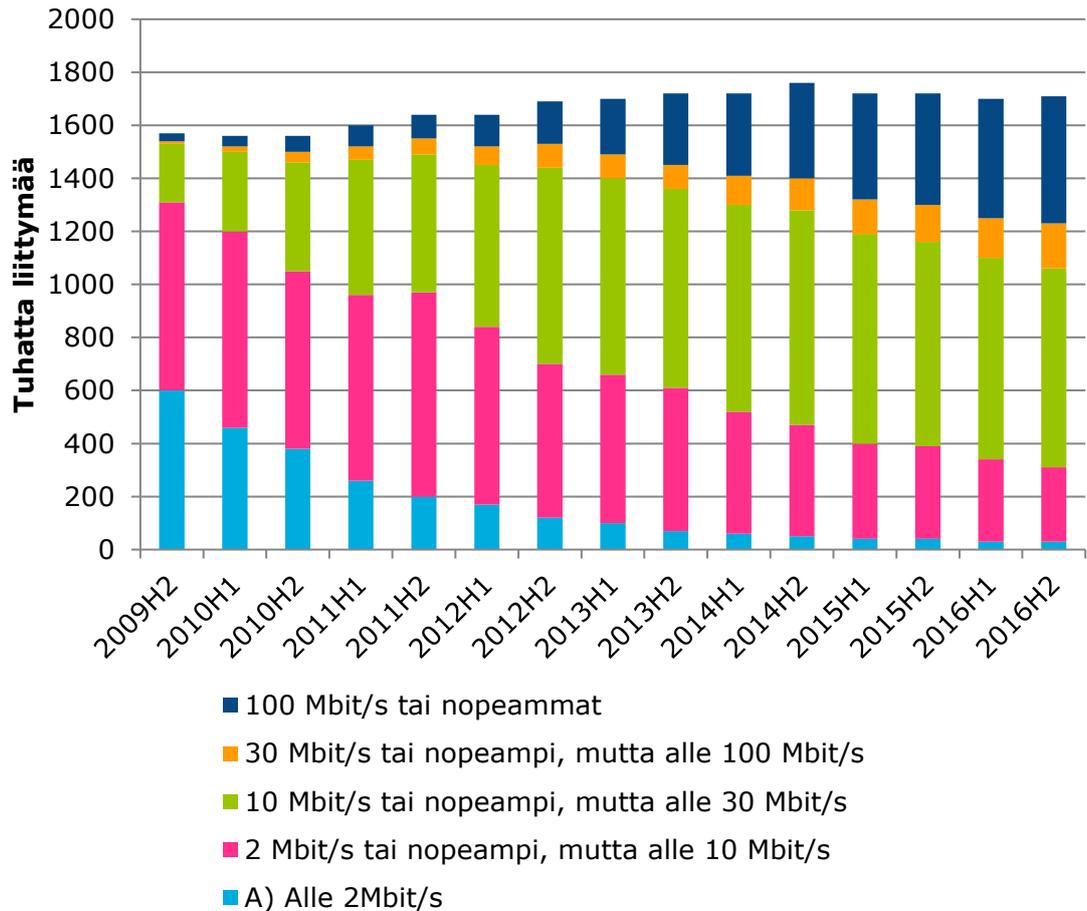


Figure 2. Fixed-line broadband subscriptions by connection speed - percentage share



At the end of 2017, around 1.9 million households in Finland had access to fixed broadband with download speed of 30 Mbps or more. This represents 71 per cent of all Finnish households. The number increased by roughly 8 per cent compared to the previous year, which means that around 100,000 additional households gained access to high-speed broadband in 2016.

Around 1.4 million households in Finland had access to fixed broadband of 100 Mbps at the end of 2017. This represents roughly 52 per cent of all Finnish households. Around 710,000 households in Finland had access to fixed broadband access with a download speed of 1 Gbps. This represents roughly 27 per cent of all Finnish households.

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 that most of the above figures represent download speeds and the corresponding upload speeds are significantly lower. This is less significant in the current situation, but as cloud services and bidirectional streaming gain in popularity, it will become more significant, and any future limitations might also concern upload speeds.

6 Stakeholder cooperation and other operations

FICORA met with several industry operators during the year. Talks were held with operators, service providers and device manufacturers alike. FICORA also updated the net neutrality guidelines published on its website⁷.

The decision that attracted the most media attention, however, was the overturning of net neutrality rules in the US. FICORA experts gave several interviews on the matter, and analysed the impact of the decision also in a Signaali blog post titled "USA dismantling net neutrality - should we be worried? According to FICORA's estimate, the decision FCC made does not have an impact on Finnish users and they should therefore not be worried.

Moreover, FICORA actively participated in BEREC's efforts to acquire a net neutrality measurement tool. Specifications were completed during the year, and sourcing was commenced. However, the supplier of the solution has not yet been selected, and FICORA will need to make a separate decision on the adoption of the measurement tool.

⁷ <https://www.traficom.fi/en/communications/communications-networks/open-internet-or-net-neutrality>

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