



Current Issues of Net Neutrality

Preparatory Document for Public Consultation

May 2012

Announcement of Public Consultation

The National Media and Infocommunications Authority (NMHH) is announcing a public consultation on the current issues of net neutrality. The consultation will take place on

date: 30 May, 10:00 am
location: Budapest, Ostrom utca 23-25.

This preparatory document aims to foster the exchange of opinion and recommendations among the stakeholders on the issues in the matter of net neutrality defined herein.

This document is available for download on the NMHH website (<http://www.nmhh.hu>). Opinions and positions regarding net neutrality can be submitted by e-mail to the Authority by 30 June 2012 to halozatsemlegesseg-konzultacio@nmhh.hu.

The Authority will draw up a summary based on the opinions and positions received and post it to the section of its website announcing the net neutrality consultation.

In its competence granted by legislation on electronic communications, the Authority will examine whether any phenomena violating the principles of net neutrality are present on the Hungarian broadband Internet access market, inhibiting competition among services and restricting the free choice of subscribers and users of electronic communications services and their access to legitimate content and services. Based on the feedback received to the consultation, the Authority will examine whether and what type of regulatory instruments should be created to resolve any potential phenomena of this nature.

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1 Executive Summary

The Internet, often dubbed the “network of networks”, was invented two decades ago and has since become a central, quasi indispensable element of our lives. It is essential for work, for accessing information and for expressing our views. The Internet is also becoming increasingly important for commerce and has emerged as a leading platform in entertainment.

Network technologies and tools developed in parallel with an increasing number of Internet users and amount of online content, leading to a jump in data transfer rates, which in turn allowed the spread of multimedia online content. As a result of the continuously increasing load on networks, more and more service providers are introducing traffic management solutions.

Service providers are increasingly using traffic management tools in a growing number of countries that allow them to discriminate against selected applications based on their own business interests, thus violating the interests of users and other service providers. The blocking or discrimination of P2P applications is prevalent among certain cable Internet providers, while mobile Internet providers are increasingly blocking VoIP and multimedia content. The blocking of VoIP applications is more common in countries where Smartphone penetration rates are the highest.

The spread of traffic management technologies and the inadequate description and communication of services has led to the debate surrounding net neutrality and subsequently, to net neutrality regulation.

Several definitions of the term “net neutrality” have been suggested, with the common element being the independence of the content and nature of information from its manner of transmission. Based on the original concept, the Internet is founded on best effort data transmission between equal endpoints, and the relevant protocols still consider this as the fundamental idea. At the same time, the use of services for which law packet loss or predictable and low delay fundamentally affect not only the user experience, but the use of the service is on the rise.

Net neutrality regulation in the European Union

The issue of net neutrality has growing significance in Europe, similarly to other places worldwide. The European Union within the Framework Directive¹ and in the Universal Service Directive² already defined numerous requirements regarding net neutrality. At the same time, the debate surrounding net neutrality continues within various institutions of the European Union (European Commission, Council of Europe, European Parliament).

Two main areas can be distinguished within the issue of net neutrality:

- traffic management and the differentiated handling of applications and ports, and
- transparency of services.

¹Directive (EC) No. 2002/21 of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (hereinafter referred to as: **Framework Directive**)

²Directive (EC) No. 2002/22 of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (hereinafter referred to as: **Universal Service Directive**)

Net neutrality regulation in Hungary

The elements of the Framework Directive on net neutrality and of the Universal Service Directive have already been implemented into the Hungarian legal regime. Following the transposition of the provisions pertaining to net neutrality defined in the framework directives into the Electronic Communications Act, the Authority defined the detailed rules governing net neutrality in various decrees.

However, the Authority has encountered numerous debates surrounding net neutrality which call for resolution in the future.

Announcement and objective of the public consultation

The Authority aims to review the current issues of net neutrality with the participation of stakeholders (service providers and users). It is initiating a public consultation for this purpose. The Authority's main objectives with the public consultation are the following:

- Raising awareness of current issues among stakeholders.
- Allowing market players and other stakeholders to voice their opinions.
- Prompting market players, primarily electronic communications service providers to handle the issues of net neutrality on their own in the context of self-regulation.

The objective of this consultation document is to summarize the main information on net neutrality and to present the issues encountered by the Authority, as well as to prompt stakeholders (ISPs, application developers, users, etc.) to share the issues regarding net neutrality encountered by them, as well as their recommendations for solutions. The document raises many questions (see Chapter 6), which are intended to obtain solution proposals from the stakeholders.

Next steps

I. phase: until 30 June 2012

In the context of the public consultation, the Authority aims to provide a platform for a wide range of stakeholders to present their stance and opinion on net neutrality with other market players and the Authority.

II. phase: until 30 September 2012

Based on the feedback received, the Authority will decide on whether to intervene in the operation of the market, and if so, with what instruments.

III. phase: on-going

The Authority will continue monitoring whether the legislative requirements on net neutrality are met and whether such requirements serve the needs of users and organisations.

Comments on net neutrality can be submitted to the Authority by 30 June 30.

2 Key issues of net neutrality

Net neutrality is one of the main issues related to electronic communications networks that has garnered substantial public attention lately; it affects all actors of the value chain significantly, whether it be service providers or users. The designation implies that the methods of data transmission should be independent from the nature of the information, in other words the data transferred via the Internet should be equally accessible by any user, application or device used.

The Internet has undergone radical changes since its creation. The development of network technologies, bandwidth and the content and services available have led to a sharp increase in the number of users.

In parallel, the quantity of content transferred has been continuously on the rise, often creating traffic bottlenecks. In order to handle such bottlenecks, service providers now apply various traffic management techniques to ensure proportionate user access to network resources.

Traffic management

Network management³ is a key element of net neutrality, and is part of the concept of traffic management, which means the differentiated handling of traffic based on an algorithm depending on parameters and defined by the service provider.

Traffic management methods may be both necessary and warranted in the operation of broadband networks because of overbooking, i.e. the network capacity requirement of the services sold generally far exceeds the available network capacity.

Traffic management methods can mitigate the negative effects of congestion and can contribute to a more fair distribution of scarce network resources among users.

Moreover, traffic management allows service providers to define service features in line with their needs that improve service quality and take into consideration user interests.

However, service providers are increasingly using traffic management tools to discriminate against select applications based on their own business interests, thus violating the interests of users and other service providers.

The blocking or filtering of P2P applications is prevalent among certain cable Internet providers, while mobile Internet providers are increasingly filtering VoIP and multimedia content.

Transparency

Besides traffic management, another issue of net neutrality receiving much attention is transparency. Chapter 4 presents the detailed provisions within Hungarian legislation regulating the place and manner for service providers to define the services they offer. We also present the compliance of Hungarian regulation governing transparency with the requirements defined in the directive.

At the same time — as reflected by the comments received — the service descriptions in individual subscriber agreements and the General Terms and Conditions are difficult to understand for

³Network management comprises various elements and areas, the most important being: traffic management, fault management, configuration management, accounting management, performance management, and security management.

customers, and the impact of the traffic management rules described therein on user habits is hard to judge.

Based on the above factors, there is still progress to make in terms of transparency. Measures to increase transparency have become more necessary than ever in light of the spread of traffic management technologies.

3 International aspects of net neutrality

The debate surrounding net neutrality first emerged in the United States prior to the 2000s. The debate flared up when telephone operators started charging content providers using large transmission capacity at no extra charge in order to achieve a return on their investments in network development.

The opposing interests of content providers and network operators — the two main interest groups — in the US is exacerbated by the fact that powerful consumer groups equate net neutrality with freedom of speech and freedom of innovation. The net neutrality debate has therefore taken on large proportions and has attracted strong political involvement.

Debates on net neutrality are also on the agenda of many countries worldwide. One of the most recent developments is the discrimination of Comcast to the benefit of its own IPTV service against the services of its competitors (e.g. HULU, Netflix) by excluding its own online streaming traffic from the data traffic limit versus the traffic downloaded from competitors. The discount introduced in March 2012 can channel users towards Comcast's own service, which is a severe infringement of the principle of net neutrality.⁴

A similar practice violating net neutrality prevails in South Korea, where in March 2012, Korean Telecom, the country's leading Internet provider suddenly restricted the Internet access of Samsung "Smart TVs" and access to the Samsung smart website. Korean Telecom justified its action by claiming that the TVs slowed Internet service for other customers. Meanwhile, Korean Telecom and the manufacturers of "Smart TVs" (Samsung, LG, etc.) came to an agreement and the restriction was lifted.

Europe's legal and market environment, radically different compared to the US, led to an entirely different approach to the issue of net neutrality.

3.1 Views of European institutions

A European-level approach to issues of net neutrality was established in April 2010. In the near year and a half that has elapsed since, European Union institutions have treated the matter as a priority issue. Positions are not yet final and are continuously evolving in line with market developments.

⁴Following a long battle, the FCC issued a directive governing net neutrality, entitled "Preserving the Open Internet", that came into force on 20 November 2011.

The main steps related to net neutrality are listed in the table below in chronological order:

Table 1: main European steps related to net neutrality

Document issued by a European Union institution	Date issued
European Commission public consultation	June-September 2010
BEREC ⁵ reply to the European Commission consultation	30 September 2010
Council of Europe declaration on net neutrality	29 September 2010
Joint Summit of the European Parliament and the Council of the European Union	11 November 2010
European Commission communication	19 April 2011
Conclusions of the Council on net neutrality	September 2011
Opinion of European Parliament's Committee on Industry, Research and Energy (ITRE) on net neutrality	20 October 2011
Opinion of the European Parliament on net neutrality	17 November 2011
Publication of the BEREC analysis on transparency	December 2011
Conclusion of the BEREC survey of European service providers on their traffic management practices	February 2012
Elaboration of the European Commission's notification procedure for member state authorities for their quality of service requirements	May 2012
Publication of the conclusions of the BEREC analysis on traffic management practices	May 2012
Expected publication of the BEREC quality of service guidelines	2012 Q3
Publication of the European Commission's position on handling net neutrality	Six months following 2012 Q3

(the rows shaded darker represent events that have already taken place, while the lighter rows represent expected future events.)

For the sake of clarity, we have briefly summarised the changes in the official declarations, opinions and general approach to net neutrality disclosed in the context of the above listed events.

- **April 2012:** Neelie Kroes, Vice-President of the European Commission responsible for the Digital Agenda announced the launch of a public consultation in order to promote the debate on net neutrality. The public consultation launched in June 2010 aims to compile the various views on the link between Internet traffic management and net neutrality. Given that the consultation left many open questions, the European Commission asked the BEREC to examine them by the end of 2011.
- In its reply to the Commission's consultation, the BEREC suggested a cautious approach to the introduction of any procedures or instruments related to net neutrality. The BEREC held the view that any European-level intervention at present, without any further studies would be premature, given that regulatory authorities are capable of protecting consumer interests with the current instruments (transparency, QoS requirements) available in the context of the amended European Framework Directive adopted in 2009.
- The importance of net neutrality is underpinned by the fact that the Council of Europe, generally responsible for the protection of basic human rights, also issued an opinion in the

⁵ Body of European Regulators for Electronic Communications

matter. Its statement is centred around the emphasis on the application of basic civil rights, such as freedom of opinion, freedom of information and data protection.

- **November 2010:** Joint Summit of the European Parliament and the Council of the European Union to discuss stakeholder opinions. The main conclusions of the forum were that transparency is key, traffic management practices are acceptable with the proper guarantees, and that the European framework regulation is sufficient, rendering additional regulation unnecessary.
- **19 April 2011:** the European Commission issued a declaration on the management of net neutrality, stating that it could only provide an answer on whether it needs to issue any guidelines or, in a more severe case, take European-level measures once the BEREC study is completed in late 2011.
- **September 2011:** the European Council publishes its conclusions on net neutrality. It recommends taking many steps in order to implement net neutrality, including the abolishment of obstacles to cross-border electronic services, ensuring that user can create, distribute and access content and services of their choice, and perhaps most importantly, allowing enough time for member states to transpose the EU Framework Directive to their national legal regimes and to examine the practical operation of regulation.
- **October 2011:** Draft opinion of European Parliament's Committee on Industry, Research and Energy (ITRE) on net neutrality, in response to the European Commission's announcement in April. Based on the recommendation, a certain degree of traffic management seems warranted for handling overstretched networks; however, to avoid abuse by service providers, continuous monitoring of such instruments by the BEREC is necessary. Over and above these elements, the opinion also urges regulatory authorities to exercise their rights arising from the Universal Service Directive to require service providers to meet minimum quality of service requirements in order to protect consumers.
- **November 2011:** the European Parliament issues an opinion. The document and its conclusions are based on the draft adopted one month earlier by the ITRE, supplemented by the key conclusion that the European Parliament accepts the European Commission's view whereby there is no need for further EU-level regulatory intervention. The European Parliament also asked the Committee to publish its position on the management of net neutrality within six months following the BEREC assessment.
- **December 2011:** the BEREC publishes its first analysis on net neutrality, on the issue of transparency. This is the first document in a series of analyses that seek an answer to the questions raised at the Committee consultations.
- **February 2012:** Conclusion of the BEREC survey of European service providers on their traffic management practices. Based on the preliminary conclusions drawn from the replies submitted, the most common form of intervention is the blocking and/or throttling of P2P traffic among both mobile operators and fixed service providers, and throttling VoIP traffic by many mobile operators. The detailed analysis is expected in 2012 Q2.
- The revision of the regulation by the European Commission in 2009 introduced a notification obligation for member state authorities if they set minimum quality of service requirements for service providers. The Commission has recently created the pertaining rules of procedure, set to be adopted in May 2012.
- **2012 Q3:** the BEREC has already prepared the framework on quality of service on which its guidelines will be based.

- In line with the European Parliament's request, the European Commission will publish its position on net neutrality within six months of publication of the last BEREC analysis.

The opinions presented above are clearly indicative of the fact that European Union institutions are currently taking a prudent approach, without applying more stringent instruments and prompting member states to handle market issues of net neutrality within their national scope, within the framework provided by the EU Framework Directive.

3.2 Presentation of the practice of EU member states

Following the presentation of the approach taken by European institutions, the following section presents the practice of member states in the matter of net neutrality. The [Regulatory Framework Directive](#) of 2009 enables national regulatory authorities to “**promote the ability of end users to access and distribute information or run applications and services of their choice**”.⁶ Although the Framework Directive does not explicitly regulate net neutrality, the provisions of the [Universal Service Directive](#) indirectly allow the fulfilment of requirements regarding net neutrality besides the Framework Directives.

We observed the same prudent approach in the majority of the countries reviewed as the one adopted by European Union institutions. Overall, it can be said that member states generally rely on current European regulation rather than elaborating their own legislation on net neutrality, considering the available tools sufficient to handle any issues in the area of net neutrality. Nevertheless, we have chosen to highlight the net neutrality regulatory approach of certain countries, as they embody the different options available in Europe today.

3.2.1 The French approach

The French approach is in line with the general European approach which believes that the tools provided by the Communications Framework Directive are sufficient for handling the issues of net neutrality.

In September 2010, the French regulator of the electronic communications and postal sectors ARCEP issued recommendations and proposals on net neutrality. The recommendations call for cooperation among the stakeholders, in particular Internet providers, i.e. instead of regulation from above, a solution more acceptable for service providers was found, based on voluntary handling of the issue instead of imposed obligations. The recommendations are:

1) Freedom and quality of Internet access

- The ability of Internet users to freely choose among content/applications/devices.
- A sufficiently high and transparent quality of service.

2) Non-discrimination between internet traffic streams

As a general rule, no differentiation between the way in which each individual data stream is treated.

3) Monitoring the traffic management techniques

4) Managed services

Service providers may offer managed services, however, not to the detriment of an adequate level of Internet access.

⁶Source: Article 8 (4) g) of the Regulatory Framework Directive

5) Increasing transparency towards end-users

- Providing relevant, clear and transparent information to end-users.
- Service providers and consumer association representatives should work together to define common information systems.

6) Monitoring traffic management practices

- Involving stakeholders in identifying and rating practices.

7) Monitoring the quality of the internet access service

- Defining the main indicators of quality of service.
- Regular disclosure of indicators by service providers.

8) Monitoring the data interconnection market

- Service providers should guarantee that every reasonable request for interconnection is handled in an objective and non-discriminatory manner.
- The Authority will periodically collect relevant information.

3.2.2 The British approach

The British approach is very similar to the predominant European, and in particular French approach, whereby the issue of net neutrality should be resolved using the instruments provided by the Framework Directive, with the active participation of stakeholders.

On 24 November 2011, the independent regulator and competition authority for the UK communications industries OFCOM issued its guidelines for the development of traffic management transparency, the first ahead of its European peers.

The guidelines are fully in line with the OFCOM's approach to net neutrality, based on the belief that the solution lies in cooperation with Internet service providers rather than detailed regulation. For this very reason, the publication of the guidelines was preceded by a public consultation, where all stakeholders were given the chance to voice their opinion and position, which were incorporated into the final guidelines.

The main points of the document are:

- 1. Understandable information is a key issue for consumers.** Consumers must be aware of any measures detrimentally affecting their use of services prior to the conclusion of the consumer agreement.
- 2. OFCOM holds the view that both "best effort" Internet services** (the nearly equal distribution of online traffic) and **managed services** (prioritised traffic) have their own useful purpose, thus their **simultaneous use are warranted.**
- 3. Innovation is vital for developing new content and services,** therefore OFCOM intends to protect innovation.
- 4. Evidence proving the stifling of innovation is a fundamental criterion** for the OFCOM to even consider the introduction of **minimum quality of service.**
- 5. Blocking services** is still an undesirable measure and should be handled by **market players** (for which the abovementioned transparency for consumers is essential). OFCOM will continuously monitor the process, and the basic concept may change if market regulation proves ineffective.

3.2.3 Dutch regulation

Following pioneer Chile, the Netherlands was the first European country to adopt separate legislation on net neutrality. We found it necessary to mention the Dutch regulation separately in detail, because we would like to present that besides the widespread European approach, there exists an other, alternative way of dealing with net neutrality. The Dutch solution regulates the various aspects of net neutrality beyond the options provided under the Framework Directive. We examined the fundamental elements of the regulation in light of four key criteria, summarised below:

1. Transparency:

- Prior to concluding the user agreement and during the term of such agreements, service providers must inform end-users of any measures taken by the service providers to handle security and integrity issues.
- Moreover, the minister may require service providers providing public communications services to provide transparent, comparable, up-to-date, clear and comprehensive information on any potential restrictions on access to and use of services and applications.
- Service providers must inform the minister and end-users of all changes in restrictive conditions on access to services and applications, as well as on the measures taken by the service providers to resolve congestion and on their impact on quality of service.

2. Minimum Quality of Service (QoS):

To be determined by the minister and not the regulatory authority.

3. Blocking applications:

Blocking services and applications is prohibited.

4. Extra charges on services:

Prohibited. (For instance, mobile operators cannot charge extra for VoIP). Service providers can continue to differentiate amongst fees based on bandwidth and data quantity.

Short-term effects of the adopted regulation:

Major service providers (Vodafone, T-Mobile and Royal KPN NV) lobbied against the adoption of the Dutch bill during the consultation phase.

The largest Dutch telecommunications service provider (KPN) announced an increase in its mobile Internet rates in less than one month following the adoption of the legislation.

In its reasoning, the company stressed that it was acting in compliance with the new net neutrality legislation, i.e. was not blocking any services nor charging extra for the use of various level services.

At the same time, given that it cannot charge heavy users more, KPN opted to spread the cost out among all users.⁷

Conclusion

A review of practices across the European Union reveals that the majority of Member States have the same prudent approach as EU institutions have. As a first step, Member States try to resolve the issues of net neutrality within the framework provided by the electronic communications regulation. The Netherlands was the second country in the world to adopt legislation on net neutrality, and thus is an exception. It is still difficult to judge the effectiveness of the applied regulation.

⁷Source: <http://news.yahoo.com/dutch-telecom-hikes-rates-net-neutrality-law-084631796.html>

4 Net neutrality regulation in Hungary

4.1 Hungarian legislation on net neutrality

The requirements pertaining to transparency broadly ensure the enforcement of the principle of net neutrality, while the requirements pertaining to quality of service affect the issue in a general manner, with no regard to the content of services or the practices of service providers in violation of these provisions, representing an objective restriction on practices in line or in violation of net neutrality.

As a fundamental principle, the Electronic Communications Act states that **consumers**

- should have access to the services needed to access information, to spread such information and to access media content, and to use the chosen services and applications;
- to connect with other consumers;
- to access reliable, transparent and up-to-date information of the features and conditions of use of services.⁸

4.1.1 The requirement of transparency

Quality, content, suspension and restriction of service

In the context of the provisions of the Electronic Communications Act guaranteeing transparency — irrespective of the nature of the service —, the service providers **must define in the GCTC** — as part of the subscriber agreement — **the content and quality of the subscriber service, as well as the conditions for the suspension or restriction of the service** (in particular the cases and conditions of restriction of traffic and the reduction of quality or other attributes).⁹

To ensure that subscriber and users are adequately informed, **the Authority may also, over and above the aforementioned elements, require service providers to provide or publish data on the quality, access or price on their services in a comparable form.**¹⁰

Quality target values:

The service provider must define the **quality of service target values of subscriber services in the GTC**, as well as the interpretation of those, and **individual subscriber agreements should make reference to the relevant sections of the GTC too.** The quality target values to be determined on a compulsory basis pursuant to the legislation on Internet access services¹¹ are bandwidth and the pertaining guaranteed download and upload speeds; these values must also be disclosed in any pertaining commercial communication related to the service, over and above the above specified manner. The service provider must also **regularly publish** the measurement methods used for measuring the fulfilment of quality target values and any information relevant to fulfilment in the specific form, manner, and with the content set out in the relevant legislation¹²

⁸Section 2 ba), bc), bf) of the Electronic Communications Act

⁹Section 127 (1); 131 (1) c)-e) of the Electronic Communications Act; Section 8 (2) 5.2 of NMHH Decree 6/2011. (X. 6.) *on the Detailed Rules of Electronic Communications Subscriber Agreements* (hereinafter referred to as: Electronic Communications Decree)

¹⁰ Section 144 (10) of the Electronic Communications Act

¹¹Section 7 (2)-(3) of NMHH Decree 13/2011 (XII.27.) *on the quality of service requirements for electronic communications services related to the protection of subscribers and users, and the credibility of rates* (hereinafter referred to as: **Quality of Service Decree**)

¹²Sections 130 (2)-(3) and 139 of the Electronic Communications Act; Sections 7 (1) cb); 8 (1) 4.1 of the Electronic Communications Decree

Traffic measurement, shaping, and management

Regarding the direct enforcement of net neutrality, the Electronic Communications Decree¹³ states the following:

- the subscriber shall be notified in the individual subscriber agreement of any traffic measurement, shaping, or management activity on the service provider's network, and of the impact thereof on the quality of service or access to other services or content, and reference shall also be made to the sections of the GTC containing the relevant specific conditions;
- if any traffic measurement, shaping, or management activity takes place on the service provider's network, affecting the quality of service or access to other services or content, the GTC shall make reference to the pertaining legislation;

To ensure that subscribers and users are adequately informed, the Authority may also, over and above the aforementioned elements, require service providers to inform subscriber of any traffic management procedures applied to network interconnection, and of the impact of such procedure on the quality of service.¹⁴

Security measures:

The GTC must also include information on events and threats to security **indirectly affecting net neutrality**, as well as on the measures it may take in relation to such vulnerable points.¹⁵

4.1.2 Quality of service guarantees

Quality of service criteria shall be defined in the Quality of Service Decree in a detailed manner based on the establishment of the service, the error ratio, availability, troubleshooting, etc., **and various quality target values depending on the nature of the service**; moreover, other QoS target values may also be defined by the service which are not included in the Quality of Service Decree. The service provider must define quality of service commitments in the GTC.

Regarding the target values undertaken, service providers must monitor the service provided based on an annual timetable and in line with its assessment plan, and if any discrepancies are detected with quality of service requirements, it shall immediately take action to restore quality.¹⁶

The service provider — in the event of fulfilment of the criteria set out in the Quality of Service Decree, in the manner defined therein — must certify the attainment of target values annually to the Authority.¹⁷

If due to an error the subscriber can only use the service at a lower quality than undertaken by the service provider, **the service provider may be required to pay a penalty if the error is not corrected within the available deadline.**¹⁸

¹³Section 7 (1) cc); 8 (1) 4.2 of the Electronic Communications Decree

¹⁴ Section 144 (8) of the Electronic Communications Act

¹⁵Section 8 (1) 4.3. of the Electronic Communications Decree

¹⁶ Section 8 of the Quality of Service Decree

¹⁷ Section 10 of the Quality of Service Decree

¹⁸ Section 9 (11) of the Electronic Communications Decree

4.2 Compliance with the Directives

In terms of the provisions of the Directive,

- the obligation set out under Article 8 (4) g) of the Framework Directive, with regard to the obligations and fundamental principles of the Electronic Communications Act, is fulfilled vis-à-vis consumers; the provisions guaranteeing the practical implementation of the principle of net neutrality apply to all subscribers;
- the requirements stipulated in the Universal Service Directive on disclosure, the substantive elements of subscriber agreements and the powers of the regulatory authority are met on the basis of the Electronic Communications Act, the Electronic Communications Decree and the Quality of Service Decree.

4.3 The NMHH's role and tasks concerning net neutrality regulation

The Electronic Communications Act does not grant statutory powers to the President of the NMHH in the domain of net neutrality, **however, issuing decree-level regulation on the elements of net neutrality is possible to the extent that such rule (set out in the President's decree) is authorised under the Electronic Communications Act.** Accordingly, for the sake of the regulation of traffic management technologies within the scope of guaranteeing transparency and net neutrality, the Electronic Communications Decree and the Quality of Service Decree include the provisions outlined above.

Moreover, within its scope defined by the Electronic Communications Act, the NMHH continuously analyses and evaluates the electronic communications market in order to ensure that the electronic communications sector provides user-friendly information.¹⁹ As a result of this analysis — within the context defined above — the President may introduce additional normative provisions.

4.4 Market surveillance

In the context of its market surveillance activity the Authority **performs the regulatory functions related to the monitoring of compliance of service providers with the relevant rules on electronic communications services** for the sake of protecting the rights of subscribers and users, and takes action in the event of their violation.²⁰ As an objective and outcome of its market surveillance procedure, the Authority assesses the services subject to the procedure and the enforcement of rights related to the activities, in the context of which it notes any **infringement of rights, assessing such cases and defining the legal consequences thereof, and defining the direction and methods for state intervention related to the promotion of voluntary compliance, and the aspects of development and possible transformation thereof.**²¹

¹⁹Section 10 (1) d) of the Electronic Communications Act

²⁰Section 10 (1) m) of the Electronic Communications Act

²¹Section 54 (5) of the Electronic Communications Act

5 Issues regarding net neutrality

5.1 Informing customers and ensuring transparency

The Electronic Communications Decree defines new rules for electronic communications service providers on the precise information to include in the specific sections of subscriber agreements and the GTC. Although, certain sections of the regulation will only come into force on 1 July 2012, service providers have already started implementing the relevant modifications.

Interpreting service parameters related to Internet service is much more difficult than in case of fixed or mobile voice services due to the complexity of the service, however, users are continuously becoming more educated in the matter, mainly due to the debates on net neutrality and their coverage by the media. Nevertheless, a wide range of users still have difficulty in comparing the numerous service packages with different features offered by service providers.

- One factor causing this difficulty is that service providers use different designations for their service features, creating an issue of interpretation for users and new subscribers.
- Another critical factor related to transparency is the interpretation of service provider traffic management descriptions.
- Also to be mentioned is that the terms widely used by experts on quantity restrictions, bandwidth reductions and other related areas are still an enigma for the average user.

Based on the above issues of transparency, the Authority is seeking feedback in the following matters:

1. How transparent do you consider the descriptions of traffic management procedures discriminating against services included in GTCs and individual subscriber agreements? How clearly are these worded for the average user?

2. Besides the information published so far by Internet service providers, how could the transparency of services be improved (what service features should be disclosed)?

3. How helpful would it be for costumers to have a unified table filled out by Internet service providers listing their packages and published them on their website? Are Internet service providers in favour of creating and publishing such a table?

5.2 Traffic management

Service providers often apply traffic management technologies. Market surveys and user feedback show that service providers often opt for traffic management methods in order to restrict access to various applications (such as P2P-, VoIP-, web-TV applications) for selected user groups.

The Framework Directive allows national regulatory authorities to define additional quality of service parameters. At the same time, the Authority may also allow the management of quality of service issues within the context of self-regulation by service providers.

With the following questions, we seek to find out the opinion of users and service providers on traffic management.

4. How severe is congestion, and does it cause any problems on service provider networks? What levels does congestion usually affect (access network, backbone network, domestic peering, international peering)?

5. Which service provider traffic management interventions are justified, and which are not?

6. To what extent do subscribers recognize the discrimination (blocking or slowing down) of service providers against certain online applications?

7. Do you currently use or plan to introduce any deep packet inspection technologies for traffic management purposes?

8. Have you experienced that in case of "Triple play" service packages (IPTV+Internet+VoIP service), the guaranteed quality of public Internet access service is not performed?

9. Is there an established practice on paid data substitution? Are there any negotiations underway in the matter between major content providers and Internet service providers?

10. What is the position of service providers on Content Delivery Networks? Do you have CDN interconnection agreements with any application or content providers, or do you provide access to such content via the CDN of another application provider?

6 Conclusions, next steps

The objective of this consultation document is to summarize the main information on net neutrality and to present the issues encountered by the Authority, as well as to prompt stakeholders (ISPs, application developers, users, etc.) to share the issues regarding net neutrality encountered by them, as well as their recommendations for solutions.

The Authority — based on the feedback received — will examine whether any further regulatory intervention is necessary, then, following the assessment, NMHH will decide on whether to intervene in market operation in the form of a position statement or further regulation.

6.1 Next steps

I. phase: until 30 June 2012

In 2011 Q4, the NMHH held several consultations on net neutrality with the affected organisations and conducted a detailed analysis of international and Hungarian regulation of the matter. Moreover, the Authority also examined the compliance of the main Hungarian Internet service providers with the net neutrality requirements set out in national legislation. This document is prepared on the basis of the information collected.

In the context of the consultation, the Authority aims to provide a platform for a wide range of stakeholders to present their position and opinion on net neutrality to other market players.

Given that for the time being, we have little feedback on Internet use, in particular from consumers, we find it essential to discover their position.

In the context of the consultation — in the current phase —, stakeholder feedback on net neutrality can be submitted until 30 June 2012. The Authority will draw up a summary of the feedback received and publish it on the NMHH website.

II. phase: until 30 September 2012:

In the upcoming phase, the Authority will examine the feedback received in detail. Moreover, service provider compliance with legislative stipulations will also be examined.

The NMHH will initiate further consultations with stakeholders if deemed necessary.

In the course of the consultation procedure, the Authority will decide whether any market intervention is necessary based on the information collected.

III. phase: on-going

Regulation of net neutrality within the EU is continuously evolving, and more and more service provider interventions are set to appear in response to market developments.

Accordingly, the Authority has defined the monitoring of service provider GTCs and draft individual subscriber agreements as a main priority for 2012. The task will be carried out throughout the year and involves all service providers. The Authority will take both administrative and informative-consultative action in order to remedy any violations discovered in this area.

7 Abbreviations

BEREC	Body of European Regulators for Electronic Communications
Quality of Service Decree	NMHH Decree 13/2011 (XII.27.) on the quality of service requirements for electronic communications services related to the protection of subscribers and users, and the credibility of rates
EC	European Commission
Electronic Communications Act	Act C of 2003 on Electronic Communications
Electronic Communications Decree	NMHH Decree 6/2011 (X. 6.) on the detailed rules of electronic communications subscriber agreements of the President of the National Media and Infocommunications Authority
EU	European Union
FCC	Federal Communications Commission (USA)
Framework Directive	Regulatory Framework Directive (2009/140/EC)
GTC	General Terms and Conditions
ITRE	Committee on Industry, Research and Energy (European Parliament)
Media Act	Act CLXXXV of 2010 on Media Services and Mass Media
OFCOM	Office of Communications (UK)
P2P	Peer-to-peer
QoS	Quality of Service
SMS	Small Message Service
USD	Universal Service Directive - 2002/22/EC
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network

The relationship between network management technologies and net neutrality

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1. Practical methods for the differentiation of traffic and their differentiated treatment

The most important element of network management²² from the perspective of net neutrality is traffic management, also known as traffic shaping, which consists of the differentiated handling of traffic based on an algorithm depending on parameters and defined by the service provider. The first step of differentiated handling is the definition of the basis of differentiation among traffic streams. The next step of the differentiated treatment of traffic is the activation of various traffic interventions based on an algorithm in function of the various types of traffic. As this document examines traffic engineering from the perspective of net neutrality, traffic will hereinafter primarily refer to Internet traffic and its treatment.

1.1. Differentiation among traffic streams

The following methods are the most commonly used for differentiating traffic streams:

Differentiation based on the type of traffic distinguishes between packets forming the specific types of traffic. Differentiation is performed in the following manner:

- **Differentiation based on the examination of the IP Header:** The ISP determines the handling of traffic based on the source or target address. A practical example of this is when a university restricts traffic between the student resident halls and the university in either one or both directions.
- **Differentiation based on the examination of the transport protocol header:** The ISP differentiates among types of traffic based on the port number or other transport protocol. P2P traffic, for instance, is often differentiated based on port number.
- **Differentiation based on the examination of the packet payload:** DPI (Deep Packet Inspection) allows the examination of the packets generated by applications. This can be used to restrict Bit Torrent streams, identified based on the P2P protocol messages and packet payload rate-limit.

Differentiation based on factors independent of traffic type consists of a differentiation based on an external factor that is independent of traffic. Such external features may include:

- **Differentiation based on the time of day:** for instance, the ISP only differentiates during peak traffic times.
- **Differentiation based on network load:** for instance, the ISP only differentiates traffic on a specific link if the load is very elevated.

²² Network management comprises various elements and areas, the most important being: traffic management, fault management, configuration management, accounting management, performance management, and security management.

- **Differentiation based on user behaviour:** for instance, the ISP only differentiates against heavy users.

1.2. Traffic interventions

Traffic interventions take on many different forms. The following are the most common types of intervention:

- **Blocking** means interrupting traffic or including an interruption message (TCP FIN or TCP RST packet).
- **Prioritisation means** using priority rows to assign various priorities to traffic types, with slower transfer of lower priority traffic.
- In case of **Packet Discard (filtering)**, packets of a given type of traffic are discarded according to a specific constant or an indeterminate variable ratio.
- **Slowing traffic by modifying TCP windows:** decreasing TCP window size compared to the size defined in the agreement which can result in stopping the sender and slowing down its traffic.
- **Application-level mechanisms** allow the ISP to control the operation of the application by modifying protocol messages. For instance, transparent Proxy servers can reverse HTTP or P2P traffic to the “Alternate Content Servers” operating on the service provider’s own network.

2. Traffic engineering and traffic policy management

2.1. The necessity and fundamental objectives of traffic engineering

Traffic management methods are vital for the operation of broadband networks because of the common practice of overbooking, i.e. the network capacity requirement of the services sold always exceeds by far the available network capacity. This business policy is common in other sectors as well, the classic example being transport. Motorways can theoretically be used by everyone, however, not at once, as it would lead to congestion. Traffic management methods can mitigate the negative effects of congestion thus contributing to a fairer distribution of scarce network resources among users in the event of congestion.

In practice, traffic engineering serves the interests of specific service providers. Oftentimes, service provider and user interests coincide, as providing the best possible service to users is a fundamental service provider interest due to market competition. The profit-oriented nature and power of service providers, however, often generate opposing interests and user interests may be violated. The diversity of interests is reflected in traffic engineering objectives. Many of these objectives serve the interests of both sides, but some only benefit service providers and violate user interests.

The common **service provider objectives** aimed for with traffic engineering are:

- **Network resource management:** maximising the general quality of service experience of the majority of users. Traffic engineering procedures allow the management of network

infrastructure utilisation, and thus of the arising costs. In such cases, traffic engineering aims to distribute scarce network resources among users fairly, in particular in the event of congestion or other abnormal circumstances (network error or other catastrophe). A specific example is when in the event of congestion, the service provider restricts Bit-Torrent applications that rely heavily on resources, as a single Bit-Torrent connection can degrade the quality of many telephone connections.

- **Network expansion optimisation:** optimisation of bandwidth usage in the last mile of the network in order to maximise network efficiency. Congestion most frequently occurs in the last mile of networks. Traffic engineering allows service providers to postpone increasing bandwidth and the related costs until the profit made on the increase exceeds the respective costs. Service providers do not calibrate their networks to the peak loads that emerge at intervals, as it would create excess capacity during normal periods.
- **Competitive advantage:** Many service providers use traffic engineering on their networks to gain a competitive advantage. Not only with bandwidth can service providers differentiate their services from the competition, but can also improve user experiences of quality of service with traffic engineering procedures.
 - **Negative discrimination:** gaining a competitive advantage by degrading or impeding competitors' services. A practical example of impediment is blocking access to VoIP applications.
 - **Non-negative discrimination:** gaining a competitive advantage without degrading or impeding competitors' services.
- **Managing subscriber needs: Adequate prioritisation of subscriber requests for applications and cost management.** Cost management in this context means notifying and charging extra rates, or alternatively, restricting its service, if the subscriber exceeds a threshold predefined in its subscription.

2.2. Types of traffic engineering

The most common types of traffic engineering are:

- **Quota/Consumption caps:** traffic engineering is applied based on the use measured during the billing period. The service chosen by the subscriber determines the traffic (bit quantity) threshold for the user in a given billing period. If the threshold is breached, the service is either restricted or the user is charged an extra cost. This form of traffic engineering does not affect network congestion, nor alleviate the bandwidth capacity shortage during periods of congestion. Quota caps restrict the bandwidth available to users.
- **Traffic prioritisation:** data packets are classified into various service classes, each handled with different priority. Classification may be based on data stream, application, device and/or user. In the event of congestion, packets with higher priority have an advantage over lower-priority packets. To ensure that lower priority packets are also served and are not completely blocked, traffic prioritisation is generally applied based on class-based queuing.

- **Traffic restriction/threshold:** prevents the traffic of the data packets of various classes from exceeding the defined bit speeds. This fundamentally controls the transfer speed of data entering the network, assigning threshold values to speed of data transmitted towards and originated from users.
- **Traffic shaping:** data transfer speed is managed in order to reach the optimal network performance. Traffic shaping is very similar to traffic restriction. The difference between the two lies in the fact that traffic shaping does not discard the packets that exceed the speed threshold, but it lets them through based on a queuing system that keeps their speed below the threshold.

The network technologies used nowadays enable service providers to create complex systems of traffic engineering procedures that vary depending on various auxiliary variables such as the time of day, the type of terminal equipment, the application, traffic conditions, etc.

2.3. Policy Management

Policy is a key issue within traffic management. Policy allows high-level business commitments and requirements — such as Service Level Agreements (SLA) network — to be met and to be enforced on the network level. Service providers defined numerous policies describing the action to take in specific situations and how the network should operate. It is particularly important to define how the network should work in the event of congestion or if the traffic quota is breached, or in the event of situations where security is threatened or under attack. Over and above these policies, there may also be policies on user data, such as data on the service package of users. The policies launch specific processes under specific circumstances in order to achieve network management objectives, to operate the network and supply services in line with business requirements and criteria.

2.3.1. Policy types

Offline vs. Inline: Offline and inline policies can be distinguished according to the method of operation of the equipment performing the policy activity.

- In case of **offline policies**, equipment placed in the data plane monitors the data plane, without intervening or influencing traffic in any way. The policy management system examines and analyses the data plane based on specific network criteria and applied policy interventions based on the findings. Policy interventions introduce connection management policies or launch other policy activity execution requests on the data plane, such as in routers or edge access equipment.
- **Inline policies** are carried out by equipment located in the data plane, which perform traffic shaping, connection management and quota management. Besides policy execution, the equipment also performs observation in the data plane. The advantage of inline policies is that they perform examinations and launch local policies much faster than an external element. Moreover, the service provider can create far more detailed policies, such as user-dependent policies.

The most common types of policy are:

- **Application- and subscriber-related policies:** Policy infrastructure also allows service providers to cooperate with subscriber so that the latter can choose the applications most important for it and define the operation of the Internet service in case of these applications. Application- and subscriber-centric policies allow the service provider to tailor the prioritisation of applications to the subscriber's needs. This policy may be combined with other policies. Combined with quota-based policies, a policy giving the user unlimited e-mail and web browsing options while defining its monthly quota for mass file uploads, for instance can be created.
- **Quota- or consumption-based policies:** Simple policies or consumption-based policies are used by service providers to limit the quantity of downloaded and uploaded data per billing period. Subscriber consumption can be measured in both directions (downloads and uploads). Service providers also have the option of charging extra fee after subscribers reach defined quota, to reduce bandwidth, or even block the service. Usage information is compiled in a breakdown by subscribers and applications. Information broken down by application can be used to filter out specific applications and to charge extra fee for others.
- **Fair use:** The objective of this policy is the fair distribution of services among subscribers. This includes the real-time monitoring of network overload information and the launch of real-time policy interventions. The policy mainly consists of restricting heavy users during periods of congestion and prioritising light users for the sake of the fair network use. The policy includes traffic shaping and/or traffic prioritisation, aimed at decreasing traffic in the event of congestion. Traffic observations have revealed that the lion's share of traffic is generated by a small portion of heavy users, while the ration of Peer-to-Peer is steeply increasing.

3. Violation of net neutrality

3.1. The principle of net neutrality based on the BEREC definition

Violation of net neutrality may take on the form of traffic discrimination. The principle of net neutrality is fully enforced on networks if the network handles every form of electronic communication equally. The equal treatment of electronic communication means that it is handled independently of (1) content, (2) application, (3) service, (4) device, (5) the sender's address and (6) the recipient's address. Independence from the sender's and the recipient's address means independence from the end-user and the content provider, the application providers and the Internet provider.

3.2. Degrees of traffic discrimination

The various types of traffic management can be classified based on the degree of traffic discrimination. The following table presents the classification:

Annex: The relationship between network management technologies and net neutrality

Degree of traffic discrimination	Types of traffic management
0	"Best efforts", i.e. no quality guarantee - no network management - no services differentiated in terms of quality of service for an extra charge
1	Traffic management procedures applied only in case of severe overload (congestion management).
2	The traffic of vulnerable services is continuously prioritised, for instance in the following order: sound, video, downloads, games.
3	Blocking of selected harmful content (e.g. spam, illegal online content).
4	Certain types of traffic are suppressed or handled with lower priority (such as P2P traffic) in case of congestion.
5	Certain service providers, content and applications are handled with higher priority, possibly for an extra charge, proffering benefits for the ISP.
6	Competitor content or applications (such as competitors' IPTV services) are blocked.

Remark: blocking of harmful content (degree 3) can be distinguished from the rest of the classification, as it does not qualify as traffic discrimination.