BEREC public consultations on Net Neutrality
Explanatory paper

In the last decade end-users, the economy and our societies have greatly benefitted from the growth in both Internet connectivity and content and applications available to them. This growth has, so far, largely relied on the so-called best effort Internet.

In BEREC's "Response to the European Commission's consultation on the open Internet and Net Neutrality in Europe"[1]in 2010, net neutrality was described as follows:

> *"A literal interpretation of network neutrality, for working purposes, is the principle that all electronic communication passing through a network is treated equally. That all communication is treated equally means that it is treated independent of (i) content, (ii) application, (iii) service, (iv) device, (v) sender address, and (vi) receiver address. Sender and receiver address implies that the treatment is independent of end-user and content/application/service provider.*
>
> *There have been and will continue to be deviations from this strict principle. Some of these deviations may well be justified and in the end-user's interest but other forms cause concern for competition and society. To assess this, NRAs will need to consider a wider set of principles and regulatory objectives."*

Regarding this regulatory setting, the EU legal framework contains a number of new or adjusted provisions related to net neutrality. Among them, BEREC considered that the most important to examine at the European level, and analyze in detail, were the following:

- Article 8(4)(g) FD: explicitly recognizes that NRAs should promote the interests of the citizens by, *inter alia*, "*promoting the ability of end-users to access and distribute information or run applications and services of their choice*" (Article 8(4)(g) Framework Directive).
- Article 20(1)(b) USD places obligations on ISPs to include in contracts with end users specific information covering, *inter alia*, traffic management policies and any limits to services or applications. Articles 21(3)(c) and (d) of the Universal Service Directive empower NRAs to impose a variety of information requirements on ISPs.
- Article 22(3) USD introduces the competence of NRAs to set minimum Quality of Service (QoS) requirements "*[i]n order to prevent the degradation of service and the hindering or slowing down of traffic over networks*".

To perform this assessment, BEREC set out a work program covering different aspects relevant to net neutrality. They are based on different legal foundations, cover various market developments, and differ in their focus on legal, technical or economic analysis:

- **Guidelines on Transparency in the scope of net neutrality**: Transparency is mandatory for any traffic management practice, and helps to foster competition and discipline ISPs through enhanced competition and the users' ability to exercise choice.

[1]http://berec.europa.eu/doc/berec/bor_10_42.pdf

- **Framework and Guidelines for QoS in the scope of net neutrality** are about assessing "degradation of service" and the conditions and ways to use the new article 22(3) USD, i.e. how to intervene when deemed necessary.

- **Differentiation practices and related competition issues in the context of net neutrality** is an economic analysis about which practices may cause harm to end-users, and under which conditions.

- **NGN IP interconnection & net neutrality** is an overview of IP interconnection markets and economic relationships between operators assessing the regulation with regard to IP interconnection in the context of Net Neutrality.

Whereas three of these work streams have led to the documents now submitted to public consultation until 31 July 2012, the guidelines on transparency were published in December 2011, following a consultation procedure in October 2011.

The *Guidelines on Transparency in the scope of Net Neutrality: Best practices and recommended approaches*[2] explore how the new EU Framework transparency obligations would work in practice. They are relevant to the other documents when considering transparency in relation to quality of service and different operators' practices. The guidelines set out the type of information to be provided, how it should be conveyed, and which bodies should be involved. They also elaborate on the requirements for a transparency policy to be effective. In 2012, BEREC plans to hold discussions with stakeholders to understand how the transparency obligations are being implemented across Europe.

Furthermore, the *Framework for Quality of Service in the scope of Net Neutrality*[3] was published in December 2011, elaborating on quality-related concepts and quality evaluation methods that are relevant to USD article 22 (3), and laying the foundation for the NN QoS Guidelines developed during 2012.

Lastly, BEREC undertook an investigation on *Traffic management and other practices resulting in restrictions to the open Internet in Europe* currently applied in the market, which is published in parallel with the three main documents described below.

BEREC acknowledges that, beyond considerations such as competition, innovation and harm to end-users' interest, there are other aspects which are a part of this debate – e.g. issues related to freedom of speech or access to certain types of content which may be deemed socially useful. These considerations are not the focus of the reports, and should be examined in the light of the relevant national legislation.

BoR (12) 31
Draft Report on differentiation practices and related competition issues in the context of Net Neutrality

This report examines and assesses the potential impact on end-users of departures from Net Neutrality at the initiative of ISPs. We define a differentiation practice as any decision of ISPs, or any agreements between ISPs and CAPs or ISPs and end-users, which results in some traffic from or to some CAPs or end-users, or related to specific applications or protocols, being treated differently to those of other CAPs or end-users or other applications or protocols. Different treatment could result from slowing, accelerating or blocking traffic. These differentiation practices could include situations in which CAPs are charged.

[2] http://berec.europa.eu/doc/berec/bor/bor11_67_transparencyguide.pdf
[3] http://berec.europa.eu/doc/berec/bor/bor11_53_qualityservice.pdf

This report examines which differentiation practices applied to the Internet access service may or may not, in principle, harm the interests of end-users and have a negative impact on competition and innovation, both in electronic communications markets ("networks") and in content application and services markets ("content"). In doing so, the report aims to provide a conceptual framework for assessing potential concerns related to end-user harm, and identifies the main elements of such assessment.

The following conclusions have been reached:
With regard to the consequences of differentiation practices, there needs to be a distinction between cases with and without vertical integration:

- In the case of vertical integration
    - Blocking or degradation of competing applications or content on the Internet could have a foreclosure rationality behind it, which harms end-users by reducing current competition and future choices.
    - Effects are higher if the end-user's ISP has some degree of market power.
    - On the other hand, these practices might not be sustainable in a transparent market with low switching costs because end-users could discipline ISPs.
- Absent vertical integration
    - The rationality behind such practices is either to reduce costs or increase income.
    - From a static point of view, a fair traffic management could have positive effects if the market is effectively competitive (not so clear in the case of SMP).
    - From a dynamic point of view, this could reduce future innovation and content diversity on the Internet, limiting future choice of end-users'.
    - The difficulty is that the assessment has to balance current benefits vs. future costs.

Between ISPs and CAPs on the Internet, moving from a practice of "no commercial relations" to direct negotiations raises several questions:

- The balance of power between ISPs and CAPs varies
- Effects on general welfare are complex
- There are risks of discrimination between CAPs
- It is considered important that differentiation practices of ISPs should be non-discriminatory with regard to CAPs i.e. they should be based on objective criteria. Otherwise a distortion of competition may arise.
- *As a consequence, there is a general preference for "content and application agnostic" practices.*

Regarding the role of competition and possible actions of NRAs

- In most cases, competition could avoid potential negative effects of differentiation practices on the Internet. Some conditions are nevertheless needed in retail markets:
    - Downstream markets are effectively competitive.
    - Awareness of end users through transparency.
    - The ability of end-users to switch and avoid differentiation practices.
    - Caution is needed, as the result will depend on the balance between individual valuation of content, switching costs and network effects.
- When retail competition is not enough to ensure an adequate outcome for end-users, NRAs have different ways to deal with specific behaviors:
    - Asymmetric regulation (article 7, when SMP)
    - Symmetric regulation (article 5)
    - Minimum QoS (in particular, in the non-SMP environment).
    - Dispute resolution (depending on the legal status of CAPs).

In the consultation, we particularly seek input on the description of the value chain and the tendencies described in the document, the assessment of the three examples provided (VoIP, P2P and CAP differentiation), and the final conclusions reached in the report.

BoR (12) 32
Draft Guidelines for Quality of Service in the scope of Net Neutrality

These BEREC NN QoS draft Guidelines follow on from the BEREC NN QoS Framework published in December 2011. The QoS draft Guidelines discuss the purpose as well as the scope and extent of USD Article 22 (3), which introduces the competence of NRAs to set minimum quality of service requirements in order to prevent degradation of service.

It elaborates on concepts such as Internet access services, specialized services, quality of service, network performance, congestion, traffic management, restrictions, degradation, throttling and blocking. Internet access services provide connection to the public Internet and thereby connectivity between end points connected to the Internet. Specialized services typically rely on access restrictions and extensive use of traffic management techniques.

Furthermore, BEREC has identified two main categories of degradation of service:

(1) the Internet access service considered as a whole, and
(2) individual applications using Internet access services.

In the first category, the quality of the Internet access service would be considered over time, and typically compared with the evolution of specialized services. For instance, the question would be whether the specialized services were prioritized at the expense of Internet access services. In the second category, we typically find cases of differentiation of traffic within the Internet access services, such as VoIP blocking, P2P throttling and prioritization of traffic from specific content and application providers.

These BEREC draft guidelines do not, however, give straightforward answers; rather, they provide guidance for NRAs to assess the severity of a situation by considering the practice itself and also in the context of the market. When it comes to defining what is a reasonable or unreasonable practice by an ISP, and whether an NRA should intervene by imposing minimum QoS requirements, the draft guidelines provide several criteria of assessment which enable NRAs to perform a regulatory evaluation of the situation. The various steps of this assessment depend heavily on national circumstances, as well as on the type of case considered: in practice, both categories of degradation may coexist, which implies a large-scope assessment by the NRA.

With regard to Internet access service as a whole, the following aspects have to be considered:

- Whether to monitor proactively or reactively
- Whether to check contracts/terms and/or to perform technical measurements
- Importance of using standardized/harmonized statistical measurement methods
- How to assess the potential degradation of Internet access services: evaluate over time, compare with specialized services, compare between operators/regions/countries
- Importance of assessing the situation at the market level: no need for intervention when there is good availability of Internet access service offers with satisfactory quality (i.e. without degradation) at a reasonable price, and the possibility and ease of switching is sufficient.

With regard to Individual applications using Internet access, other aspects are highlighted:
Firstly it is crucial to understand the traffic management practice(s) in question:

- What is its true purpose?
- Is it application-specific or application-agnostic?
- Are there legitimate reasons, such as network security and integrity
- Is it proportionate to its objectives; are there any side effects?

Secondly the practice has to be assessed in the context of the market:

- Availability and penetration of *unrestricted* Internet access service
- Ease of switching (including price difference)

If intervention is deemed necessary, NRAs need to select the most appropriate regulatory tool: as well as minimum QoS requirements, they should consider transparency remedies, competition tools and other relevant provisions of the regulatory framework. Whichever tool is selected, an NRA should apply the three-part proportionality test: effectiveness, necessity and strict proportionality. If minimum quality requirements are to be imposed, the NRA will notify the Commission about the draft measures, and also make the information available to BEREC. The NRA shall take utmost account of any comments or recommendations of the Commission.

In the consultation, we seek stakeholders' comments particularly on the criteria proposed for the assessment of, on the one hand, degradation of Internet access service as a whole, and on the other hand, issues regarding individual applications used over the Internet access service. We also seek input on the conditions and process for regulatory intervention, as well as on the relevance and exhaustiveness of the scenarios described.

BoR (12) 33
Draft report "assessment of IP interconnection in the context of Net Neutrality"

The focus of the paper is on the wholesale level of interconnection between ISPs and other intermediaries in the Internet value chain. It analyses how deviations from net neutrality may or may not be reflected at the interconnection level governing transmission of packets across the Internet as a collection of different networks (an Autonomous System).

Interconnection arrangements between networks are not directly related to net neutrality as long as all traffic flows are treated equally. A violation of the net neutrality principle is therefore considered unlikely if all traffic is treated in a best effort manner. The best effort principle is reflected in today's interconnection agreements across IP networks taking the form of transit and peering agreements. Important aspects governing these wholesale markets include the separation of network and application layers, best effort vs. QoS-assured services and the charging principles that are applied.

The discussion on IP interconnection in the context of net neutrality takes places in the wider context of ongoing debates between stakeholders on charging mechanisms used for IP-interconnection, including around the revision of the International Telecommunication Regulations (ITRs). While the BEREC and ITU processes are completely independent from each other they both deal with the common theme of charging principles for IP interconnection, and both attach great importance to maintaining the freedom of the Internet and ensuring a multi-stakeholder approach. To further discuss these issues with stakeholders and experts BEREC will hold an expert workshop in cooperation with OECD in Brussels on June 20th, 2012.

A number of hypotheses/conclusions have been reached:

Trends along the value chain:

- The Internet ecosystem has managed to adapt IP interconnection arrangements to reflect (inter alia) changes in technology, in (relative) market power of players, in demand patterns and in business models. This happened without a need for regulation.
- The emergence of hyper giants (Google etc.…), the emergence of Content Delivery Networks (CDNs), and the increasing role of regional peering related to the decreasing role of IP transit providers contributed to the flattening of the Internet topology.
- Increasingly, large "Eyeball ISPs" acquire Tier 1 status.
- QoS differentiation potentially leading to deviations from net neutrality mostly occurs within the ISP's network providing connectivity to the end users.
- QoS traffic classes across interconnected networks hardly exist in practice.

- In best effort networks, alternative mechanisms - compared to the strategies followed in networks offering enhanced quality - for improving end-to-end network performance have been developed. Examples are endpoint-based congestion control for reduction of the traffic load, Internet Exchange Points and increased use of peering. Also, CDNs are used to improve the CAU's perception of an application's quality (QoE).
- Both sides of the market - Content and applications providers and end users - contribute to paying for connectivity to the Internet. Whether an ISP can exploit the physical bottleneck for traffic exchange depends on whether the charging mechanisms entitle that ISP to a payment at the wholesale level due to its monopoly position, and on the degree of competition at the retail level.
- The separation of network and application layers is a characteristic feature of the best effort Internet having enabled innovation and growth.

Regulatory issues:
The current Regulatory Framework foresees an obligation to negotiate interconnection on a non-discriminatory basis (Article 5 AD). However, it does not provide a legal basis for mandating free peering.

- The market has developed very well so far without any significant regulatory intervention.
- Disruptions in IP-interconnection due to disputes between ISPs potentially lead to a situation where not all destinations of the Internet may be reached. However, such instances have been few and have to date been solved in a relatively short time without regulatory intervention – often due to competitive pressure of end users at the retail level.
- Since the early days of the Internet there have been constant changes in the respective markets along the value chain - involving new types of players as well as new types of interconnection arrangements. NRAs need to better understand these markets.
- Depending on Member States' respective situations, NRAs may take different approaches: some countries may consider data-gathering exercises useful whereas most others do not consider them appropriate unless concrete problems or requests occur.
- Any measure could potentially be harmful, so it should be carefully considered.

In the consultation, we have asked questions at the end of each section particularly to seek input on the role and classification of players along the value chain, new types of interconnection developing and the impact on the competitiveness of the market.

Common elements of analysis

NRAs have the following objective: promoting competition to the benefit of end-users, and enabling the long-term development of networks and services through innovation (both at the edge and the core of the network) and the development of the most efficient technical and business models. With this in mind, in preparing guidance on net neutrality, BEREC has reached the following observations and conclusions:

- While not providing a guaranteed delivery of data, the best effort approach of the Internet does not necessarily imply low performance.
- The separation of network and application layers is a characteristic feature of the best effort Internet, and it has enabled innovation and growth.
- The IP interconnection market has developed very well so far without any significant regulatory intervention.
- While traffic management and other differentiation practices are not intrinsically harmful, they are nonetheless capable of being used for questionable purposes or in an inappropriate manner.
- Providing information on these restrictions is mandatory – the information must be understandable and comparable for end-users to exercise choice, and accurate enough for NRAs to monitor ISPs' practices.

- The situation is different in different Member States, and BEREC is proposing general criteria to enable NRAs to evaluate traffic management practices on a case-by-case basis in their respective markets, including e.g. whether they are application-agnostic and whether the end user has control, whether the practice is objectively justified, proportionate and non-discriminatory.
- Beyond this, given the complex and evolving nature of the Internet, detailed prescriptive rules do not seem appropriate at the moment.

According to the data gathered by BEREC, a majority of ISPs offer Internet access service with no application-specific restrictions. But specific practices, such as blocking or throttling of peer-to-peer traffic or VoIP, may create concerns for end-users. They do occur more often in mobile networks than in the fixed network sector. One of BEREC's findings is that, while at least 60% do not face such restrictions, at least 20% of mobile Internet users in Europe experience some form of restriction on their ability to access VoIP services. The data is not clear enough to enable reliable conclusions to be drawn about the remaining nearly 20% of users, who might or might not face such restrictions. Furthermore, it is important to note the differences between countries (regarding for example the number of operators providing unrestricted access).

To fulfill their objectives, in particular under Article 8(4)(g) FD, NRAs are equipped with a number of regulatory tools, and are ready to act without hesitation if necessary.

NRAs will first rely on their competition powers and their ability to impose transparency obligations.

- Competition is expected to discipline operators and result in the best offers for consumers.
- However, in order for competition to be effective, end users require transparency and the ability to switch service providers in order to fully exercise their consumer power.
- Transparency requires the active involvement of end users.
- Both NRAs and end users should be able to monitor the performance of the Internet access service, and of the applications used via that IAS.
- Where competition and transparency prove to be inadequate or insufficient to address net neutrality related concerns, NRAs will use further specific tools. The appropriate regulatory tool will depend on the specific market situation and be based on a thorough assessment of the traffic management practice.
- In order to prevent degradation of service, minimum quality requirements can be imposed on one or several operators. Degradation of service should be assessed dynamically.

BEREC is committed to the open Internet, and believes that the existing regulatory tools should enable NRAs to address net neutrality related concerns for the time being (though not all of these tools have been fully tested yet). NRAs will continue to closely monitor the evolution of the market and are ready to act without hesitation if necessary.

The public consultation of the three draft reports is open until 31 July 2012. Responses can be sent to the BEREC Programme Management mailbox pm@berec.europa.eu. Comments should preferably be given in English.