Summary of BEREC positions on net neutrality

Over the last three years of intensive work on net neutrality, BEREC has published a number of documents, including market findings and guidance on several key topics related to net neutrality[1]. This paper aims to provide an overview of these reports, and to summarise BEREC's current position and lines of action in relation to net neutrality.

I. THE CONTEXT

There is unanimous agreement that the Internet has greatly contributed to growth and innovation in our economies. This was facilitated by the decoupling of the network and application layers, enabling competition and allowing service innovation to take place, in particular, at the edges of the network[2]. The best effort Internet paradigm is intrinsically linked to the nature of the IP protocol, enabling application-agnostic transmission of data packets over IP networks. To BEREC, "net neutrality" describes the principle of equal treatment of network traffic[3]. A violation of the net neutrality principle is considered unlikely if all traffic is treated on a best effort basis.

The benefits of a best effort system notably include the support of innovation and of end user choice. In terms of innovation, the model offers low barriers to entry on the open platform of the Internet, which has provided particularly fertile ground for new content and applications to develop. In terms of end user choice, the best effort Internet has fostered users' ability to access and distribute any content and/or application.

At the same time, these very benefits can place the innovators and end users against the operators running the networks that make up the Internet, who are themselves facing increasing demands on those networks. New and cheaper technologies are increasingly available enabling ISPs to restrict certain data streams, and to differentiate to adapt to the heterogeneity and sustained growth of Internet traffic, in particular on mobile networks, leading ISPs to start questioning the principle of equal treatment all the more.

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1 A list of BEREC publications is provided in the Annex to this document.

2 See BEREC (2010a) BoR (10) 42 and also ERG (08) 26 final, in particular A.5.1.

3 In BEREC's response to the European Commission consultation on the open Internet and net neutrality in Europe, a literal interpretation is provided, for working purposes: '*all electronic communication passing through the network is treated equally*'.

The key question for BEREC in the net neutrality debate is thus how much control operators[4] can legitimately exert over the traffic on their networks.

BEREC has carefully considered the extent to which NRAs may need to intervene, e.g. to prohibit certain forms of traffic management (e.g. the blocking or throttling of certain applications, or the prioritising of certain types of content under certain conditions). The debate around this question has included calls for swift public/regulatory intervention, while other players have called for business freedom and leveraging on the free market, and for competition (principles which have also characterised the development of the Internet to date). To assess these opinions, BEREC has focused on the services providing access to the Internet, evaluating the impact of different practices on the regulatory objectives set out in the electronic communications framework.

Facts from the markets

Regarding the behaviour of operators, BEREC undertook an investigation into '*Traffic management and other practices resulting in restrictions to the open Internet*' currently applied in European markets, which was published in May 2012. BEREC found that application-specific restrictions are not widespread, except for some specific practices, mainly on mobile networks. At the same time, however, the investigation revealed a great diversity of experiences among national markets.

Specific practices, such as the blocking or throttling of peer-to-peer traffic or VoIP, can create concerns for end users. BEREC has found that they occur more often in mobile networks than in fixed networks, and that, while at least 60 % of customers do not face any such restrictions, at least 20 % of mobile Internet users in Europe do experience some form of restriction on their ability to access VoIP services[5]. Beyond blocking and throttling, a variety of other differentiation practices are in use, including the introduction of data caps or of billing policies that distinguish between applications accessed using the Internet access service. On fixed networks, the provision of specialised services with some form of quality of service (QoS) control, separate to Internet access services, is quite common, in particular for voice services (VoIP) and linear TV (IPTV).

Furthermore, the response to these practices from other market participants, in particular how end users factor these practices into their switching decisions, still requires further exploration by BEREC.

Relevant provisions in the European framework

Both the technical and economic aspects of the net neutrality discussion fall under the remit of NRAs, and the Framework Directive sets NRAs' regulatory objectives in this regard, notably to promote 'the ability of end-users to access and distribute information or run applications and services of their choice' (Article 8.4.g FD). NRAs have several other objectives which they should also consider, including the promotion of 'competition, including for the delivery of content' (Article 8.2.b FD) and 'efficient investment and innovation in new and enhanced infrastructures' (Article 8.5.d FD). At the same time, with a view to fulfilling these objectives, the framework provides for transparency obligations (in respect of terms of service) to apply to operators (Articles 20 and 21 USD), while NRAs are equipped with

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4 Equal access to certain types of content may also be restricted (e.g. blocked or filtered) as a result of obligations imposed by public authorities on operators, or as a result of other stakeholders' initiatives (see the end of this document). These aspects are generally outside the remit of NRAs; hence the focus of BEREC's work is on examining operators' practices on their networks, at their own initiative.

5 The data are not clear enough to draw firm conclusions about the remaining nearly 20 % of users, who might or might not face such restrictions.

specific powers – e.g. to impose minimum requirements for the quality of services provided (Article 22.3 USD).

These obligations and powers apply to the provision of transmission capacity over the end user's broadband connection, which can take one of two forms: Internet access services (IAS) and specialised services. Whereas IAS provide users with a connection to the public Internet, specialised services typically rely on strict access restrictions and the extensive use of traffic management techniques. Specialised services are intrinsically offered on contractual terms which ensure the quality of the service provided. Based on this fundamental difference in service provision, IAS offers will usually be the ones requiring regulatory scrutiny, as they provide universal connectivity, enabling universal access to information (as per Article 8.4.g FD). Specialised services should be monitored for their potential to degrade IAS, should they grow at the expense of (rather than alongside) the best effort Internet.

II. BEREC'S ANALYSIS OF THE SITUATION

The forms of traffic management are diverse and not all are necessarily harmful

Traffic management practices do not intrinsically undermine healthy competition or cause a reduction in consumer welfare. They can be used for legitimate reasons (e.g. in order to guarantee network integrity or to improve efficiency in resource allocation and to permit specialised services when required). In this context, BEREC's analysis has focused on two main types of traffic management: (a) where the IAS (as a whole) is degraded (e.g. resulting from specialised services becoming widespread), and (b) where the treatment of specific applications are differentiated within the IAS (e.g. through blocking or throttling).

Both the widespread deployment of specialised services and the generalisation of user-based or application-based prioritisation on IAS can result in a degradation of the general performance of the standard (non-prioritised) IAS below an acceptable level.

BEREC has also studied the interconnection market, since healthy relationships at the core of the Internet are a pre-condition for satisfactory user experiences in accessing content globally. BEREC has found that the best effort principle is reflected in today's interconnection agreements across the Internet (in the form of transit and peering agreements). If traffic flows are treated equally, as is likely in a best effort Internet environment, then concerns around net neutrality should not arise. It is true that disruption of interconnection at the wholesale level could still occur in a best effort world, leading to a situation where end users cannot reach all destinations on the Internet and thereby potentially impacting net neutrality. However, such instances have been few and to date they have been solved relatively quickly and without regulatory intervention, in part as a result of competitive pressures from end users at the retail level.

IP interconnection has worked well so far

As described in BEREC's report, '*An assessment of IP interconnection in the context of net neutrality*', the Internet ecosystem has managed to adapt IP interconnection arrangements to reflect (inter alia) changes in technology, in the (relative) market power of players, in demand patterns and in business models. This has happened without the need for regulatory intervention.

Interconnection on the Internet has operated on the basis of commercially negotiated transit/peering arrangements at the higher network/backbone level, and a 'bill and keep' approach at the access level, whereby the terminating access network operator does not receive wholesale payments for terminating traffic, but recovers its costs at the retail level

from the end user. 'Bill and keep'[6] at the access level, which results in the absence of termination charges to the access network operator, is one of the major reasons why access network operators find it difficult to more fully exploit the termination bottleneck.

Up to now, interconnection with QoS assured across network boundaries has not, or has hardly, existed in practice. As described in BEREC's comments to specific proposals for ITU/WCIT[7], over the internet, a guaranteed end-to-end QoS offer appears neither commercially nor technically realistic. In best effort networks, alternative mechanisms for improving performance have been developed and have proven to be more efficient and cost effective, such as end-point-based congestion control for reduction of the traffic load, Internet Exchange Points and the increased use of peering as well as content delivery networks (CDNs). While QoS differentiation may be an appropriate tool to deal with scarcity of bandwidth in access networks, e.g. by prioritising voice services, the situation is different in IP-backbone networks, where additional capacity is cheaper.

Indeed, BEREC considers that the expected traffic volume increase will not require a significant CAPEX increase in fixed networks, as usage-based costs are roughly stable[8]. Therefore, adding capacity has been, and is likely to remain, the strategy of choice.

At this stage it is worth noting that there is no evidence that operators' network costs are not already fully covered and paid for in the Internet value chain, unlike what is sometimes alleged by some ISPs in the net neutrality debate. Both sides of the market, content and application providers (CAPs) on the one hand, and users of applications on the other, contribute to paying for Internet connectivity (and hosting). CAPs also pay for CDN services that bring their content closer to the end user.

Overall NRAs need to better understand these markets. Depending on the market situation in individual Member States, NRAs may take different approaches: some NRAs may consider data-gathering exercises useful whereas others might not consider them appropriate unless concrete problems or complaints occur. Considering that the market has developed very well so far without any significant regulatory intervention, NRAs will consider any regulatory measure very carefully before deciding whether to intervene.

But some traffic management practices can be problematic

Given the potential impact on end users of certain traffic management practices or contractual restrictions on IAS, BEREC has analysed the circumstances in which such practices might trigger regulatory concern. Primary considerations include the real purpose of the practice, as well as the effect of its implementation. Furthermore, when evaluating the static and dynamic impact of these practices, BEREC identified specific risks of undesirable behaviour causing harm to consumer welfare, competition in the different markets, and innovation.

Purposes matter

Certain practices might be used by operators to extend or maintain a position of strength in the market – affecting market competition through undue discrimination, degradation or blocking –ultimately to the detriment of consumers. Generally speaking, there is a vast array

6 For an analysis of the efficiency properties of bill and keep, see BoR (10) 24 BEREC Common Statement on Next Generation Networks Future Charging Mechanisms / Long Term Termination Issues.

7 See BoR (12) 120 rev.1 BEREC's comments on the ETNO proposal for ITU/WCIT or similar initiatives along these lines

8 WIK-Consult (2011: 59); likewise Plum Consulting (2011: 19), concluding that overall costs are likely to fall for fixed networks.

of opportunities for differentiated treatment of traffic enabled by recent technologies (degradation or prioritisation or differentiated levels of quality), and some of these can raise real concerns. On the one hand, product differentiation can be a legitimate commercial choice for undertakings seeking to make their services more attractive than their competitors', and differentiation can thus increase consumer choice and consumer welfare. On the other hand, the regulatory framework calls on regulators to ensure that such policies or practices do not undermine other important principles such as interoperability, end-to-end connectivity and the quality of applications that depend 'on the underlying network' (Recital 34 USD) – particularly if prioritisation introduces an incentive to degrade the best effort IAS in order to induce ISPs' clients to pay a higher price for premium quality service.

Implementation matters too

Regardless of the motivation behind a practice, BEREC considers that certain techniques for managing traffic should be scrutinised by NRAs with particular care, because of their greater potential harmful effects. Typically, measures aimed at ensuring network security and integrity are likely to have legitimate objectives; however, they should not go beyond what is necessary, for instance by affecting content or applications beyond those explicitly targeted by the measures. Similarly, when evaluating congestion management practices, NRAs should consider whether any less intrusive techniques could be used instead, having the same effect on the traffic load in the network. This evaluation involves verifying that the measures match their specific objectives, while minimising their side effects.

Finally, it should be pointed out that, even with legitimate underlying reasons and careful implementation, some measures might still reduce users' welfare, as described below.

Risk and impact of differentiation measures

To assess the above-mentioned practices, BEREC conducted an analysis of the short- and long-term economic consequences of differentiated traffic management practices (or pricing) on users, set out in its report '*Differentiation practices and related competition issues in the scope of net neutrality*'.

BEREC identified several risk factors as regards the impact of differentiation practices on competition in the different markets and on innovation. This impact depends, in particular, on the market power and vertical integration of the ISPs carrying out the traffic management.

Traffic management can be of economic interest in the short term but can lead to foreclosure where ISPs have some degree of market power and/or are involved in some form of vertical integration (integrated services, partnerships, bundling, etc.). Where the levels of competition, transparency and switching costs are adequate, this foreclosure is likely to be unsustainable. Indeed, undesirable outcomes are less likely if users are properly informed about the performance and quality of service of the different offers.

Where ISPs nevertheless gain some control over the repertoire of content offered to users, this presents risks in the long term for both innovation and cultural diversity. This would be a particular problem if the practice of blocking or throttling applications were to become widespread, particularly where e.g. all ISPs blocked the same application or different ISPs blocked different applications.

BEREC notes with some concern the possibility of moves from the current model (where CAPs generally do not interact with the ISPs who control access to end users, and ISPs do not charge CAPs for conveying their data streams), to a model of commercial negotiations which provides greater scope for ISPs to discriminate between CAPs based on non-objective criteria. Assessing the effects of such practices on social welfare is complicated, but the risks of competitive distortions should be borne in mind.

More specifically, although unlikely in a competitive market, should negative differentiation (lower priority, degradation of service, etc.) occur aimed at specific CAPs, this would raise serious concerns of undue discrimination. On the other hand, positive differentiation (higher priority, out-of-cap delivery etc.) to the benefit of specific CAPs would raise concerns around some CAPs not being able to enjoy the same conditions of delivery as the favoured content, even if they were willing to pay the corresponding price.

Given the above, BEREC concluded that the above-mentioned practices would harm end users in the following two cases. Firstly, when the retail market is not effectively competitive, degradation could impact upon the end users' ability to choose or even - in the case of vertically integrated operators - produce a high risk of those operators leveraging market power from the dominated market to closely related markets. Secondly, end users could also be harmed in an effectively competitive market if several providers were to perform different forms of degradation, the collective impact of which would be that current Internet features would be very difficult to maintain, severely affecting end users' welfare. In addition to limitations on end users, network effects and incentives to innovate decrease, as the potential consumption of content and applications is reduced.

This assessment confirms that certain practices might indeed harm users under certain circumstances. In BEREC's view, current market incentives mean the risk of such harm is limited; however, the consequences of widespread differentiation are of sufficient importance for regulators to monitor the markets and be ready to intervene if necessary. Given this, BEREC also draws the high-level conclusion that it would neither be appropriate nor relevant within the current regulatory framework to define *a priori* reasonable and unreasonable traffic management practices (e.g. through whitelists or blacklists). It calls for a case-by-case analysis instead, taking into account not only the practice itself but also the behaviour of parties and market characteristics.

BEREC guidance on assessing traffic management (and related restrictions)

BEREC acknowledges that ISPs should have the opportunity to manage their networks in order to increase efficiency, minimising the resources needed to provide the service and ensuring end users get the best deal. However, these arguments are valid only if the practices themselves remain reasonable. BEREC proposes to evaluate the 'reasonableness' of traffic management practices and contractual restrictions by applying the following assessment criteria:

(i) **Non-discrimination between players**. The practice is done on a non-discriminatory basis among all CAPs.

(ii) **End-user control**. It is an important indicator of reasonableness when the practice is applied on the request of users at the edge, who can control and deactivate it. The level of control is deemed higher when the user does not incur costs for removing a restriction.

(iii) **Efficiency and proportionality**. The measures should be limited to what is necessary to fulfil the objective, in order to minimise possible side effects. The intensity of the practice, such as frequency and reach, is also important when assessing its impact.

(iv) **Application agnosticism**. As long they are able to achieve a similar effect, BEREC expresses a general preference for 'application-agnostic' practices. This reflects the fact that the decoupling of the network and application layers is a characteristic feature of the open Internet, and has enabled innovation and growth.

In accordance with these criteria, practices are likely to be considered reasonable where they are limited and clearly outweighed by their advantages. This methodology is further described in '*BEREC guidelines on the quality of service in the context of net neutrality*'. As regards this framework for the analysis of restrictions, the same principles should apply to fixed and mobile networks, although the case-by-case analysis might reflect differences in technological constraints.

III. BEREC GUIDANCE ON REGULATORY APPROACH

The previous section described how BEREC has examined some potential obstacles to net neutrality, in particular the conditions under which operator practices might undermine the ability of end users to access and distribute information or run applications of their choice pursuant to Article 8.4g FD. Having identified these obstacles, BEREC has also described how an NRA can develop an efficient and proportionate policy to promote net neutrality in its market. This regulatory approach has three main components, namely: (1) to stimulate market forces in order to discipline the provision of IAS offers; (2) to monitor the services provided and evaluate whether deviations from net neutrality need to be addressed; (3) to ensure, if necessary, the resolution of net neutrality issues, notably in the case of excessive degradation of service.

(1) Ensuring that market forces work

Strengthening competition through SMP regulation

Competition plays a vital role in guaranteeing net neutrality: the greater the pressure created by competition, the higher the quality of access products and the less incentive an ISP will have to diminish the quality of its own services. Competition is expected to discipline operators and result in the best offers for end users.

In accordance with the European framework, NRAs have a duty to stimulate competitive dynamics in the retail markets with ex-ante regulation at the wholesale level (when SMP has been found, according to Articles 14–16 FD). NRAs will continue to pursue this objective, and will also refer to these powers, where appropriate, as a tool for promoting the development of high-quality Internet access products that satisfy the principle of net neutrality.

Promoting effective transparency

For competition to successfully discipline operators' behaviour in the interests of their customers, end users must be fully aware of the characteristics of the ISPs' access offers, including those related to net neutrality. In particular, transparency allows users to identify unrestricted IAS offers that provide access to all applications available on the Internet, as well as any limitations applied to restricted offers. Providing enhanced information on these restrictions is mandatory, according to Articles 20 and 21 USD, and is a key instrument to ensure net neutrality. For BEREC, an effective transparency policy should ensure the information provided is accessible, understandable, meaningful, comparable and accurate.

In order to make information on offerings more meaningful and comparable, BEREC favours the development of common frames of reference on IAS, including on which practices can be considered as standard network operation, and on what information should be emphasised in operators' communications. By way of example, in relation to access speed, the average download and upload speeds should be specified, not only the maximum speed. Common terminology (to make information more comparable and understandable) should be promoted, as well as tiered approaches to the distribution of information (i.e. highest visibility for key facts). Third parties and end users should be closely involved in any such initiative.

Furthermore, in order to promote the open Internet, BEREC highlights the importance of unrestricted offers being available and easily identified.

The fundamental role of switching

End users need effective transparency but also the ability to easily switch service providers in order to fully exercise their consumer power. Indeed, end users must be able to make informed choices throughout the different stages of a commercial relationship and be able to switch contracts easily. The ability of end users to switch to an appropriate offer depends on the availability of such offers, and on the ease of switching in a broad sense, including in relation to all burdens faced by customers. Furthermore, easy switching requires that all significant evolutions of access offers (in terms of net neutrality) must be communicated clearly, and customers should benefit from the possibility of acting upon them, which they are entitled to do in accordance with the USD. This is an area of potential concern, since consumer associations have recently put forward the view that information on traffic management is still poorly understood and factored into users' switching decisions (although they do observe an increasing interest among users in the quality of their service). The issues of switching conditions and users' behaviour need to be further assessed by BEREC, as regards both the current situation and trends, as they will be critical to the future functioning of the market.

These tools may not be sufficient

While the tools described above are necessary, BEREC nonetheless acknowledges the limitations of a pure competition-based approach. First, even in highly competitive retail broadband markets, some obstacles could remain, notably if the overall cost of switching (charges, but also burdens and inconveniences) is deemed higher than the perceived disadvantage caused by the restrictions. Second, even if users wish to avoid a restriction, they may face situations where they cannot (e.g. if they wish to communicate with another end user whose access is restricted).

(2) Detecting and evaluating harmful practices/degradation of service

Quality of service and market monitoring

A thorough monitoring (e.g. measurement and publishing) of the IAS performance and availability in each market will, on the one hand, increase transparency and, on the other hand, improve NRAs' capacity to analyse, in the specific context of this market, a practice which might raise concerns. BEREC therefore recommends that the quality of IAS offers in the market be monitored over time in order to detect potential degradations, of which BEREC has identified two main categories, as described above: (a) where the IAS (as a whole) is degraded (e.g. resulting from specialised services being provided at the expense of IAS), and (b) where individual applications using IAS are degraded (e.g. through blocking or throttling).

Supervision of the evolution of the market could also include monitoring the levels/nature of complaints from end users (including CAPs). Both this data and the results from quality monitoring would need to be verified in order to determine whether it provides a solid indication of undue traffic treatment. This verification could include, for instance, comparisons of results over time (e.g. against the evolution of the performance of specialised services) and comparisons with data available from other regions or providers.

Evaluation of the practice and of the market situation

The regulatory process by which NRAs evaluate practices, notably degradations of service, consists of two successive phases.

First, the practices impacting individual service offers are evaluated based on the criteria described in Section II above. These recommend, in particular, that application-specific measures should not be used when application-agnostic measures would achieve the same effect.

Second, it is important to take into account market conditions and the behavior of the operator carrying out such practices. NRAs will consider the availability of affordable service offers without degradation, i.e. (a) IAS offers with sufficient quality and/or (b) unrestricted IAS offers. In the latter case, it is essential to take network effects into account, since unrestricted end users are also affected by the number of restricted users (i.e. the first group is not able to use the relevant applications to communicate with the second group).

Regulatory intervention, notably the imposition of minimum QoS requirements, might be justified if the practice is not reasonable and the availability of alternative IAS offers without degradations at a reasonable price is low, or if the possibility and ease of switching is limited.

(3) Acting when necessary

When, after examining the circumstances as indicated in Section II, the NRA concludes that market conditions are such as could harm end users, either in the short term or in the longer term, it should address the situation using the most appropriate combination of regulatory tools. NRAs will first look to further fostering competition using the *ex-ante* regulatory measures[9] available in the regulatory framework, together with measures to enhance transparency, as described in paragraph (1) above.

If these measures do not appear to solve the market failures identified, or at least not within the expected timeframe, NRAs should consider using other regulatory powers, such as obligations derived from Article 5 AD, dispute resolution powers (including powers to resolve disputes between ISPs and CAPs when this is within the NRA's remit), or imposing minimum QoS requirements pursuant to Article 22.3 USD, as described in paragraph (2) above. Each of these tools has its advantages and limitations, and may be more or less appropriate depending on the specific circumstances, though they are not necessarily mutually exclusive.

Imposing minimum quality of service requirements

Article 22.3 USD enables NRAs to impose minimum QoS requirements 'in order to prevent the degradation of service', either alone or in combination with other powers and remedies. Where degradation is identified through monitoring, the goal of the minimum QoS requirements is to prevent or alleviate this degradation, by forcing the ISP to improve the service quality until the degradation is eliminated.

Effectiveness, necessity and strict proportionality should guide the NRA's decision on whether the use of these powers is justified. The consequences of using this powerful provision should be considered carefully; BEREC considers that, except for certain cases where urgent action might be needed, this remedy should only be used when other regulatory tools cannot achieve sufficient results within a reasonable timeframe. The NRA should therefore assess the threat the situation poses to its regulatory objectives, and in particular, whether end users who are being offered a degraded IAS have difficulty in accessing/distributing content and applications of their choice.

Since there are different types of degradation (notably the two categories identified above – (a) affecting the IAS as a whole and (b) affecting specific applications within the IAS), the appropriate QoS requirements might vary. Where the IAS as a whole is degraded (e.g. by the prioritisation of specialised services), NRAs might prescribe IAS quality parameters relying

9 Another possibility is intervention according to general competition law.

on appropriate statistical methodology. Where individual applications are being degraded (e.g. blocked or throttled), NRAs might simply prohibit such restrictions on the relevant application(s).

IV. NEXT STEPS AND BROADER DEBATE

Other viewpoints in the net neutrality debate

NRAs and BEREC have focused on examining operators' practices on their networks, as well as their relationships with some CAPs and the impacts of their behaviour on consumers' experience. We are nevertheless aware that net neutrality proponents are also concerned by the practices of other players in the Internet ecosystem, and call for extended national or European legislation that would guarantee a continued equality of treatment along the Internet value chain. For instance, some have expressed concern over the possible restriction by over-the-top (OTT) providers and terminal manufacturers of access to content, as these players increasingly gain momentum and the power to steer consumers' choices. Search engines and operating systems for mobile devices are also often depicted as playing a key role in the link between users and content, and these debates have resulted in the coining of the terms 'search neutrality' or 'OS neutrality'.

At the same time, BEREC acknowledges that, beyond considerations such as competition, innovation and harm to end users' interests, there are other aspects of the net neutrality debate, e.g. issues related to the preservation of public freedoms (like freedom of speech or access to certain types of socially useful content), as well as the need to maintain public order and national security, and the obligations that public authorities can legitimately impose on operators as a result (blocking, filtering etc.). Although these issues are of the utmost importance in all democracies, these considerations are not the focus of BEREC's work, as they sit, for the most part, outside the remit of NRAs. They should be examined in the light of the relevant European and national legislative frameworks.

Regulators' continued commitment to net neutrality

BEREC is committed to the open Internet, and believes that the existing regulatory tools, when fully implemented, should enable NRAs to address net neutrality-related concerns. For the time being, the situation appears to be mostly satisfactory and problems are relatively rare, though this assessment should be nuanced, as the situation varies significantly between national markets. Having said that, the net neutrality debate is legitimate, since rapidly evolving practices make it credible – though not certain – that problems will arise more frequently in the future. NRAs will therefore continue to closely monitor the evolution of the market, including setting up measurement schemes for the quality of the IAS available, and are ready to act without hesitation if necessary.

BEREC's guidelines are designed to remain flexible in this fast-changing Internet ecosystem. BEREC also acknowledges that market situations and regulatory national frameworks may vary, which could result in different interventions, if any, from Member State to Member State. Consequently, the detailed conditions for any intervention to be decided and defined (triggers and thresholds) should be defined and managed by each NRA in light of its national market conditions.

Going forward, BEREC will continue to deepen its analysis and understanding of the Internet ecosystem and to exchange experiences and best practices among its members (including around platforms for measuring the quality of IAS). During 2013, it will more specifically continue to monitor market developments and consider in more depth consumers' incentives.

ANNEX A

THE FULL SET OF BEREC DOCUMENTS ON NET NEUTRALITY

BEREC BoR (10) 42 - BEREC's Response to the European Commission's consultation on the open Internet and net neutrality in Europe
(September 2010)

- This document is BEREC's first overview of net neutrality topics. BEREC concludes that the current regulatory framework (including new provisions strengthening transparency and enabling the imposition of minimum QoS requirements) is likely to be sufficient to address many of the concerns that have been expressed in the context of net neutrality.

BEREC BoR (11) 67 - Guidelines on Transparency in the scope of Net Neutrality: best practices and recommended approaches *(December 2011)*

- Transparency is mandatory for any traffic management practice, and helps to foster competition and discipline ISPs through enhanced competition and users' ability to exercise choice. The guidelines explore how the new EU Framework transparency obligations would work in practice. They 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. They are relevant to the other documents when considering transparency in relation to quality of service and different operators' practices.

BEREC BoR (11) 53 - A framework for Quality of Service in the scope of Net Neutrality
(December 2011)

- This framework for quality of service in the scope of net neutrality sets out the foundations for defining quality of service in relation to net neutrality, elaborating on quality-related concepts relevant to IP networks and on quality evaluation methods on the Internet. This framework provides a conceptual basis for the guidelines on quality of service in the scope of net neutrality (BEREC BoR (12) 131

BEREC BoR (12) 30 - BEREC findings on Traffic management and other practices resulting in restrictions to the open Internet in Europe *(May 2012)*

- BEREC undertook an investigation on practices currently applied in the market, according to which 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. These do occur more often in mobile networks than in the fixed network sector. Furthermore, the data gathered shows significant differences between countries.

BEREC BoR (12) 132 - Report on differentiation practices and related competition issues in the context of Net Neutrality *(December 2012)*

- The report on differentiation practices and related competition issues in the context of net neutrality provides a conceptual framework for analysing the effects of differentiation practices, such as blocking or prioritisation of traffic, on competition and innovation. It examines various differentiation practices applied to Internet access services and considers how these might, in principle, harm the interests of end-users and have a negative impact both on electronic communications markets and on content application and services markets.

BEREC BoR (12) 130 - An assessment of IP interconnection in the context of Net Neutrality

(December 2012)

- The report gives an overview of wholesale IP interconnection markets and economic relationships 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 and considers related regulatory issues.

BEREC BoR (12) 131- Guidelines for Quality of Service in the scope of Net Neutrality

(December 2012)

- The guidelines on quality of service in the scope of net neutrality provide guidance to NRAs on when and how to exercise powers to impose minimum QoS requirements on operators in order to prevent degradation of service. They provide guidance to NRAs on how to assess the any restrictions, and how to reflect the particular context of the national market in question.

03 December 2012