

EBU reply (extracts) to the European Commission's public consultation on specific aspects of transparency, traffic management and switching in an Open Internet

15 October 2012

Question 2:

a) Please provide the full name and a brief description of your organisation and describe your interest in open Internet issues.

The European Broadcasting Union (EBU) is the world's foremost alliance of public service media organisations, with Members in 56 countries in Europe and beyond. The EBU's mission is to defend the interests of public service media and to promote their indispensable contribution to modern society. It is the point of reference for industry knowledge and expertise. The EBU operates Eurovision, the media industry's premier distributor and producer of top quality live sport and news, as well as entertainment, culture and music content. The Eurovision satellite and fibre network is the largest and most reliable in the world directly plugged in to public service media everywhere.

The EBU and its members are fully committed to an open, transparent and secure Internet. The Internet has become an essential platform for public service media for delivering services to citizens and interacting with audiences in unprecedented ways. It is in the public service media remit to be universally available on all platforms reaching all segments of society and in the citizens/consumers right and interest to have access to a broad range of content, particularly content deemed important for the democratic, cultural and social needs of European societies (i.e. public service media content). Moreover, the Internet's open character has been a key driver of innovation. Public service media drive innovation and actively contribute to the open Internet's success and the Internet take up with the development of new services, new formats, new technologies and high quality content.

Effective, consistent implementation and enforcement by Member States of the EU Telecom Package net neutrality principles (i.e. freedom of access, transparency, non-discrimination and quality of service) is a key condition/prerequisite for guaranteeing an open Internet. Member States' legislation should ensure that everyone can access and distribute the content or run applications and services of their choice, on the device of their choice. Net neutrality principles are a fundamental instrument to preserve fundamental public policy objectives such as pluralism and cultural diversity and to enable public service media to carry out their public service mission on the open public Internet. There is an inevitable link between the regulation of transmission and the regulation of content which must be taken into account.

Some have proposed there may be a “special case” for content serving a specific democratic or social purpose. Should the Open Internet not be maintained, then the political pressure to move towards solutions such as this or for having regulation (such as in the Netherlands) will increase. Moreover, it should be stressed that NRAs must use the full extent of tools at their disposal to preserve the Internet's openness, as certain regulatory means, such as transparency requirements. These requirements are essential but might be deemed insufficient to address the blocking and degradation of service and ensure minimum quality of service. In general, further consideration should be given to the different regulatory tools available under the telecom package (i.e. universal service obligations and must-carry rules).

The open public Internet must remain the norm not the "exception". In that respect, the EBU welcomes BEREC's recent work on transparency, quality of service and IP-interconnection which empower NRAs with the necessary guidelines, parameters and criteria for action to ensure compliance with the net neutrality principles. NRAs and the Commission should be prepared to intervene rapidly and effectively in case of discriminatory behaviour from ISPs as regards their traffic management practices and risk of consumer harm (i.e. the ability of the end-user to easily switch provider or tariff).

1. Traffic management

1.1. Traffic management and differentiation

Question 3:

Please explain briefly which traffic management techniques are usually applied by network operators or ISPs and how they are technically implemented.

The EBU believes that BEREC's draft report on differentiation practices and related competition issues (BoR (12)31) published on 29 May 2012 covers this adequately.

Question 4:

Congestion management is one of the reasons for applying traffic management measures.

a) Please describe briefly how congestion management normally works.

We believe that BEREC's draft report on differentiation practices and related competition issues (BoR (12)31) and the findings from BEREC's and European Commission's joint investigation on “A view of traffic management and other practices resulting in restrictions to the open Internet in Europe” (BoR (12)30) published on 29 May 2012 cover this adequately.

b) If possible, please provide a definition and examples of genuine congestion management measures, i.e. measures which are necessary to avoid or tackle network congestion, as opposed to measures which may be called congestion management but actually pursue other purposes.

We believe that traffic management measures should be limited to a strict minimum and can only be justified in very specific cases such as protecting the integrity and security of the network, user devices, services or applications (e.g. from viruses or Denial-of-Service attacks); combating spam; implementing legal obligations of complying with a court order or minimizing the impact of congestion (in which case equal types of traffic are treated equally). The EBU understands that problems experienced by end-users are often the result of peak-time congestion. But we believe that traffic management is not the ultimate solution to deal with network congestion and for improving end-to-end network performance in the best efforts network.

Alongside investments in additional bandwidth capacity, we believe that there are a range of techniques which specifically reduce the congestion burden on the network. Public service media organisations in several Member states have taken their responsibility in alleviating network congestion through techniques such as content delivery networks (CDNs) and peer-to-peer communication for enhanced network architecture for high capacity best efforts communication. In addition, they have also adopted measures which enhance overall technical efficiency (such as the adoption of improved compression technologies or the use of broadcasting signals in hybrid devices to minimise network congestion). Furthermore, broadcasters are using adaptive streaming as congestion management. When there is no congestion the end user receives the highest quality (bitrate). When the network is congested the quality is automatically reduced to the possible available bandwidth.

Also (transparent) caching as deep as possible into the network is a viable technique to reduce congestion. We would suggest giving further consideration to the application of Article 12 (1) (f) of Directive 2002/19/EC (Access Directive) for the right to place caches in IT networks. One could argue that, just like the right to place antennas in a communication tower, broadcasters (and other CAPs) should have the right to place caches in IP-Networks in order to be able to reach all citizens. Other advanced techniques to optimize data traffic in best efforts networks are multicasting and eMBMS on wireless broadband networks. Multicast is an important technique for one-to-many communication that would reduce the risk of network congestion and improve Quality of experience (QoE) for consumers in particular during live broadcasts over Internet or for pre-caching popular content. Multicast is an established technique but requires a specific kind of interconnection of networks. All caches produced in the last five years have multicast support. Multicast is currently not used in best effort networks because some actors in the network do not support it. There is no official reason why it is not used by some operators. eMBMS is the broadcast mode of LTE. When multiple users request the same content (e.g. live video or pre-caching download) in a mobile network it is much more efficient to broadcast the content from a base station instead of setting up a lot of individual Unicast connections. While eMBMS is an integral part of LTE specifications, it is not implemented in the LTE networks.

The EBU would welcome a debate on how to create the right conditions and incentives for enhanced use of efficient techniques that maximise the availability of bandwidth and optimize the data traffic.

Question 5:

Please provide your views on the following ways/situations where traffic management may be applied by ISPs.

Traffic management measures:

a) applied to deliver managed services (e.g. to ensure a guaranteed quality of service for a specific content/applications)

Traffic management measures are an appropriate means to deliver managed services. We believe that a managed lane can co-exist with the best efforts Internet lane. However, we'd like to reiterate that the open Internet should remain the norm and not the exception. Traffic management measures which enhance the efficiency of managed services could potentially be problematic insofar and to the extent that it lowers the quality of services delivered through the open 'best effort' Internet lane.

Services over the open Internet and "managed" services are provided over the same physical and network infrastructure (broadband access connection). This means that, whenever bandwidth is reserved for the delivery of managed services, this could negatively affect the quality of best-efforts Internet by leaving insufficient network capacity for best-efforts access to the open Internet. Furthermore, there is a danger where the open Internet is used for the delivery of content and services that are in direct competition with those offered by a vertically integrated network operator. There may be an incentive to lower the quality of the best effort Internet connection by the vertically integrated operator.

b) taking into account the sensitivity of the service to delay or packet loss

EBU and its members believe that a proper distinction needs to be maintained between open Internet access and the provision of managed services. Each of them responds to a different logic. Any traffic management practices (i.e. throttling) on the public open Internet should be kept to a minimum and should be allowed only in specific cases (i.e. to alleviate congestion on the network during peak times, to preserve the integrity of the network, user equipment, services or applications or to comply with a legal justification or Court order).

Traffic management taking into account the sensitivity to delay or packet loss is only appropriate provided that it is limited to a strict minimum, that it is properly justified and that equal types of traffic are treated equally. Video traffic is indeed sensitive to IP packet loss or delay. But we do not believe that traffic management should be the ultimate solution for dealing with network congestion as they do not ensure an optimal user experience on the public open Internet. Furthermore, in so far as traffic differentiation practices are used as the main tool for dealing with network congestion, maintaining these practices act as a disincentive for network investment. It is the EBU view that that the solution is a combination of investment in additional capacity and advanced technical solutions for efficient traffic

delivery (see also response to question 4, b)). Traffic management techniques taking into account the sensitivity of the service to delay or packet loss should not be used as a means to avoid the necessary investments in additional capacity.

c) used to implement or manage compliance with the explicit contractual restrictions (e.g. on P2P or VoIP) of the Internet access product accepted by the user

These measures are appropriate provided that contractual conditions are clearly communicated to the user and provided that the term “Internet access” is reserved solely for offers which provide full access to services available on the Internet in order not to mislead end users. For specific capacity-hungry applications such as P2P, applying specific management practices such as throttling of traffic would obviously limit its legitimate use for example for live video or real time play back of on demand files because they worsen the user experience for those who use P2P protocols.

d) targeting types/classes of traffic contributing most to congestion

These measures are problematic because of the risk that ISPs could use these to degrade the user experience of Over The Top (OTT) video content in order to encourage users towards using their own managed services. The EBU does not believe that traffic management based on traffic classes are the solution to deal with network congestion. Investment in additional capacity and advanced technical solutions for efficient traffic delivery should go hand to hand. In so far as traffic differentiation practices are based on concerns over network congestion, maintaining these practices also act as a disincentive for network investment.

e) targeting heavy users whose use is excessive to the extent that it impacts on other users

These practices cannot be imposed at the full discretion of the ISP and can only be an appropriate measure towards those users that violate the conditions of their subscription contracts. A key prerequisite is that contracts clearly state what the agreed limits in terms of available bandwidth or amount of data are. ISPs should ensure that normal use in accordance with the subscription contracts does not lead to network congestions, including in the peak time.

f) applied during busy times and places, when and where congestion occurs

In most cases traffic patterns are known by ISPs, including when and where network congestion could be expected. In exceptional cases, unforeseeable congestion could occur and that would justify reasonable traffic management practices (i.e. throttling) on the public open Internet. However, such cases should be the rare exception, rather than a common practice. We also refer to our responses to question 5 a), 5b) and 5e).

g) affecting all applications/content providers in the same way (application-agnostic)

Any traffic management practices (i.e. throttling) on the public open Internet should be kept to a minimum. In exceptional cases and provided that they are properly justified, equal types of traffic must be treated equally. However, a positive differentiation (e.g. giving priority to

packet loss or delay-sensitive applications) would be acceptable in so far as it enhances the quality of experience for the user.

h) affecting (similar) applications/content providers of the same category in the same way

See answer under g).

i) used, without other grounds, against services competing with the ISP's own services

Discriminatory and anti-competitive traffic management practices shall be prohibited. The fact that an ISP may favour its own content and services over those of its competitors is regarded as discriminatory and anti-competitive. We also refer to our response to question 5a).

j) implemented at the full discretion of the ISP

Allowing traffic management practices implemented at the full discretion of the ISP is incompatible with EBU's view that traffic management practices should be limited to a minimum because it would become very difficult to check whether traffic management are justified as an exceptional measure.

k) other differentiation criteria (please specify)

Not applicable

Question 6:

The use of managed services may affect the Internet access service in some cases, due to the sharing of access resources.

a) Please explain the impact of managed services on the standard Internet access service ("best effort") in terms of available bandwidth and quality of service.

In the two-lane model, open Internet access and managed services are delivered to the end user over the same physical broadband infrastructure, which means that available capacity has to be divided between the two. We believe that managed services can co-exist next to a dynamic best effort Internet. However, specialised (or managed) services should not be offered by ISPs at the expense of the development of the open public Internet and should not prevent access with sufficient QoS to content provided by public service media for instance which have to be universally available across platforms.

Operators of such managed services must be required to make their services available on fair, reasonable and non-discriminatory (FRAND) terms. Bandwidth capacity for managed services should be provided in addition to the bandwidth sold to the end user as "Internet access". This implies that downlink capacity, caches, digital subscriber line access multiplexers (DSLAMs) and the last mile connections of ISPs should provide a sustained and sufficient capacity for both 'open Internet' and managed services to which an end user subscribed. As long as the ISP does not oversell the available capacity, congestion would in theory not be possible in its domain.

The example of the DSLAM demonstrates this. The available capacity on a DSLAM is shared between the end users connected to it. By overselling the capacity of that DSLAM, the end users whose Internet traffic is connected to it will experience slow and unstable Internet connections during peak time. This problem would not arise if an ISP would reserve the actual bandwidth mentioned in the Internet subscription agreement. This would obviously not prevent congestion from occurring at the IP-interconnection points. For the impact of managed services on the available bandwidth and QoS at the interconnection level, we refer to BEREC's findings in its draft report on "An assessment of IP-interconnection in the context of net neutrality" published on 29 May 2012.

b) Please explain whether it is possible to offer separate capacity for managed services and the standard Internet access service. If yes, please provide information on the circumstances (costs, technologies) of separating them.

As explained by BEREC in its draft report on "An assessment of IP-interconnection in the context of net neutrality" published on 29 May 2012, managed services like IPTV do not cause problems at the level of interconnected networks because the traffic is ingested directly into the ISP's network and copied in caches for quick play. The managed traffic would run from a server of the content and application provider (CAP) via the rented uplink capacity of the CAP to the Internet Exchange or CDN. From there it would directly be cached in the ISP network or travel over rented lines. The content of the managed service would be pushed once to a cache in the ISP's domain instead of having to travel from the CAP server to the end user with every individual request. This configuration ensures that the capacity for managed services is provided via uplink/downlink/CDN/peering, caching and DSLAM (or fibre termination) and would be constant. The associated costs should be covered by the subscriptions sold for that managed service. At the retail level, network operators should provide clear information about the reserved bandwidth for the 'open Internet' in order to enable end users to know if and to what extent the managed services affect their connection to the open Internet offering.

Question 7:

a) Please give examples of "new business models" which could be developed on the basis of managed services by

(i) Network operators/ISPs:

A managed lane would create new business opportunities where the provided services depend on a sustained minimum technical quality of broadband connection which may not be generally available on the open Internet. Examples include HD linear and catch-up TV over IP, and HD VoD, which are often priced higher than similar offering in SD quality. Beyond media services, managed services could be provided in many other areas, such as security and surveillance, telemedicine, smart metering, telecommand, telebanking, specialized cloud-based services, interactive gaming, and others. While many such services are also being offered over the open Internet, network operators could potentially monetise the capability of managed line to deliver a guaranteed QoS level. The development of managed

services should however not jeopardize investments in improving the speed available for the open Internet.

(ii) Content providers (on the basis of agreements with ISPs):

See answer to question 7 a) (i).

b) How important are these innovative business models likely to become in the next three years? Please substantiate your view by means of available forecasts or studies.

Consumption of all media services, including TV, is steadily growing and this trend is expected to continue. Increased technical quality (e.g. HDTV) contributes to the growth. At the same time, innovative media services, such as on-demand and catch-up TV, hybrid TV, multiscreen and multiplatform services are gaining popularity. Many of these new services require broadband connection. It is therefore very important that a range of delivery options are available to content providers. Managed services could satisfy part of this demand, in particular where high technical quality is required. Many network operators are also distributors of content from broadcasters and for example HD quality is available in more expensive content offerings.

c) What would be the expected benefits in terms of innovation and investment through new businesses (content or applications) benefitting from guaranteed levels of quality of delivery through managed services?

The open Internet is undoubtedly the main driver of innovation and investments. At the same time, managed services exist for some time in one form or the other. IPTV is an example of such a managed service that has been offered with variable success in different markets. The expected benefits could possibly come in terms of: - increased QoS available to the users through the specialised offerings - increasing user expectations on QoS over the open Internet. This could result in competitive pressure towards the OTT providers and potentially lead to continuous innovation and investments. The expected benefits are likely to materialize if the quality of the open Internet is preserved and the competition ensured between the providers of managed services.

Question 8:

What are likely positive and negative effects of certain traffic management practices on the Internet ecosystem, in particular on innovation and investment, by (i) network operators/ISPs and (ii) content providers? Please explain your view and, if appropriate, distinguish between different traffic management practices.

Traffic management techniques should not be used as a means to avoid the necessary investments in additional capacity. With a view to reaching the ambitious European broadband connection targets, substantial investments in additional capacity are needed. In so far traffic differentiation practices are based on concerns over network congestion, maintaining these practices act as a disincentive for network investment. Public service media organisations understand that many of the end-users' problems arise due to peak-time congestion. They are committed to take up responsibility to help alleviate congestion and to improve end-to-end network performance (e.g. use of CDNs to minimize network load). CDNs are an efficient way to improve the viewer quality of experience. PSMs have also

adopted other measures such as the adoption of improved compression technologies and the use of broadcasting signals in hybrid devices to minimize network congestion.

1.2 Traffic management and privacy issues

Question 10:

a) Are there any privacy risks arising from the use of DPI for traffic management purposes, and, if so, what are the implications for transparency and consumer protection?

DPIs are a form of filtering (surveillance) of Internet packages and content. They can be used for legitimate purposes such as, security, combating piracy and illegal content (i.e. child pornography), however they can also be detrimental to the protection of privacy and personal data (i.e. by monitoring of users' on-line activity for commercial advertising purposes, for example) and could be used by certain countries as a means of censoring the Internet. Through the use of these traffic management techniques, the network operators and ISPs should not take on the role of policing or controlling/monitoring the Internet usage. In short, there are questions about their role and responsibilities.

The legitimacy of such practices has been raised by the European Data Protection Supervisor in its Opinion 2012/C 34/01. The latter raises the analogy with the postal service. What would happen if the postman was allowed to read the content of the letter he or she delivers in order to decide if and when it will be delivered? It would drastically change the concept of sending post. According to the EDPS's opinion, the ISPs' inspection of individuals' communication content/data in order to differentiate each communication flow and to apply specific network policies raises serious threats for the individual's privacy and personal data protection. As stated by the EDPS, the correct application of monitoring and inspection and filtering techniques must be done in conformity with the EU data protection and privacy regulatory framework, in particular the right to confidentiality of correspondence and the user's consent.

2. Transparency and switching (consumer choice)

2.1 Transparency and general characteristics of the Internet access offer

Question 12:

In order to allow consumers to make informed choices, on the basis of clear, meaningful, and comparable information, which elements should be communicated to consumers?

- Elements related to traffic management practices:

a) Contractual restrictions (blocking, throttling, other restrictions on application use)

Safeguarding transparency to Internet users with regard to restrictions to the access to content and applications is essential in order to achieve net neutrality. That's why the EBU strongly supports the work BEREC is doing in this field. Offers should be meaningful and comparable for Internet users based on common terminology and frames of reference and information on traffic management practices should be provided to end users along with information about how these practices may affect the end users' access to the Internet.

b) Traffic management policy applied to prioritise certain traffic in specific circumstances

It is important that the end user is able to decide when certain traffic and services are prioritised and if and to what extent that traffic affects their open Internet connection.

c) Whether and to what extent managed services may affect the quality of the best effort Internet (e.g. the possibility of the Internet connection being affected when watching IP-TV or when using other managed services)

ISPs should clearly communicate which sustained bandwidth is available for the 'open Internet'. This should be part of a contractual agreement between the ISP and the end consumer and it should be easy for the end user to check at any time if the conditions of the contract are met. ISPs should also be transparent on the interconnection bitrates they have at their actual disposal. This would avoid the situation where an open best efforts Internet offer looks good on paper because of the guaranteed speed of the 'last mile' but where the ISP's connection with the Internet is the real bottle neck. Information on the sustained bitrate for end users should be based on a sustained throughput of the ISP.

Transparency regulation should not only aim at contractual statements concerning details of ISPs' Internet connection offers to end consumers, but should also contain specifications of compulsory real time information that should be made available by network operators about the status of the traffic travelling over the Internet. This is necessary to enable end users or third parties to check if the contractual statements of ISPs are met, but also to enable an environment where content providers can help end users to solve problems with accessing Internet services and deliver the best Quality of Experience possible.

The availability of real-time information is essential for the public to monitor their data communication. Thus consumers would be able to verify if the quality contractually accorded by their ISP is actually delivered. Otherwise there will be no free market mechanism to balance statements of providers and end users due to information asymmetry. How can someone challenge a service sold when he cannot prove its case? The level of transparency is satisfactory when it is known what happened with the data travelling over the network. Everybody should be able to retrieve this information: for instance average users may rely on a browser or a feature of a player, skilled users may rely on a network sniffing software such as WireShark which is able to retrieve this information, thus transparency can be used as a differentiating tool in the field of Net Neutrality.

d) Other restrictions, please specify:

Broadcasters are confronted with growing amounts of complaints of their audience about problems with video playback on their websites. In order to help the audience/public, broadcasters need to identify if the cause of the problem is the responsibility of the end user (home network), or the network operators (transport) or lays at their level (publication and distribution of content). The task is not easy, the level of complexity is growing and special software needs to be developed to track those problems. Information must be available of what is happening in the network.

In order to better serve their audiences, public service media organizations in a number of Member States (e.g. BBC, IRT, VRT, NPO and ARD) have started to develop specific software to track problems and identify where these problems lie (e.g. with the end-user, with the network operator or with the broadcaster). These tools should be used to verify the applied traffic management measures and enable public service media to improve, together with their ISP partners, the Quality of Experience delivered to the audiences. Moreover, network operators do not have to make additional investments in order to provide the transparency information but only need to follow the existing specifications.

There are several Internet standards commonly used that describe the possibility to add this kind of data to the content packages travelling over the network. For example: - Header information should be completed according to RFCs (e.g. the Via, X-Forwarded-For) and this information should be correct. - Paths taken by packets throughout the networks should be transparent (e.g. IP-record route option, traceroute) - Time needed to pass each hop and the network as a whole (i.e. ping, traceroute/tracert) in order to identify delay (RTT<100 ms) and jitter - ICMP control messages compulsory when traffic management is in effect (codes "Destination Unreachable", "Communication administratively prohibited", and / or "Precedence cut-off in effect")

This last example is about reporting what kind of network management is used. If the network operator did block, throttle or slow down the packets, the reason can be explained in this metadata field. All the above examples are important in order to check the network operator activity and all this information can be read out easily with commonly available software, for example WireShark. For the average user this could be realized by a browser or

video player showing a traffic light labelling (green for RTT < 100ms, red for congestion) comparable to EFSA or EU energy labels.

Common standard terminology is necessary to help end users to decide what kind of Internet connection they need. The idea is that end users can make a choice of the connection on the basis of the Internet services they want to use. Broadcasters and many other content providers can only state what speed their content is delivered to the Internet as a whole. It is a specification stating what minimum sustained throughput is needed between the server where the content is stored and the end user device in order to allow uninterrupted playback of the content. Therefore, we would opt for a Minimal Sustained Bandwidth specification as a standard term to describe this. An ISP should therefore mention what the minimal sustained connection speed is to allow end users to decide if the connectivity offered by that ISP would be sufficient to watch the content (quality) they prefer. Ideally, this minimal sustained bandwidth specification should also define minimum values for packet loss, jitter, upstream and downstream as well as reveal (missing) support of BitTorrent and Multicast.

EBU would like to stress that real-time (rather than theoretical) information about Internet traffic delivery is what matters most for the end-user and should be made available in order to enable end users (or third parties) to check if an ISPs is delivering what it has committed to in the Internet access subscription contract. Internet end users alone will quite often not be in the right position to identify and locate the cause of their Internet viewing experience. As mentioned earlier, several public service media organizations have started developing specific software to track problems in order to assist their audiences and the EBU would welcome opportunities to exchange experience and information regarding such diagnostic tools.

The EBU wishes to stress the importance of the issue of DSLAM or fibre termination overbooking. Even if it were possible to optimise all traffic flows at the level of the interconnection market, the DSLAMs or fibre terminations could still be a bottleneck preventing the occurrence of QoE. At peak media consumption hours, users that share their Internet connection with their neighbours via the overbooked DSLAM or fibre terminations will suffer a reduced QoE.

e) Data allowances (caps), download limits

Communicating this information is important because, otherwise, the end-user runs the risk of being faced with unexpected connection interruptions at any time. In combination with sustained speed, the download data limit can be illustrated for instance by giving an example of how long video can be watched by how many people at a certain quality (bitrate). This allows the end-user to draw his/her conclusions.

f) What these data allowances enable customers to do in practice (download x hours of video; upload y photos etc.)

This is important information because it would help the end consumer to understand what kind of service he or she signs up to.

Elements related to speed and quality:

a) Average speed, typical speed ranges and speed at peak times (upload and download)

This is important because this will give the end-user an idea about what kind of Internet subscription he/she subscribes to. The contract between an ISP and an end user should clarify what are the expected performance levels (in terms of speed and quality) (similarly to professional service level agreements). As mentioned earlier in our response to question 12, d), we would propose opting for a “minimal sustained bandwidth” specification which would define minimum values for packet loss, jitter, upstream and downstream and which would reveal (missing) support of BitTorrent and Multicast.

b) Respect of guaranteed minimum speed (if applicable)

We refer to our response to question a).

c) What these speeds allow customers to do in practice (video-streaming, audio-download, video-conferences etc.)

It is important but it would only be an indication. It does not specify what the expected quality is of such a video-streaming experience. If the open Internet subscription only allows 500kbs speed, it can be expected that the video-streaming quality will be low.

d) Latency/network responsiveness (a measure of traffic delay) and which services would be affected thereby (e.g. certain applications such as IP-TV or videoconferencing would be more seriously impacted by higher traffic delays in the network of the provider)

This is important because sustained bandwidth will improve the quality of those media services that require interactivity or large file transfers.

e) Jitter (a measure of the variability over time of latency) and which services would be affected thereby (e.g. echoing in VoIP calls)

We refer to our response to question a).

f) Packet loss rate (share of packets lost in the network) and which services would be affected thereby (e.g. VoIP)

We refer to our response to question a).

g) Reliability of the service (network accessibility and retainability), i.e. measure for successful start and completion of data sessions

We refer to our response to question a).

h) Quality parameters for (mobile) voice telephony (call setup success rate, dropped calls, speech quality, other)

We refer to our response to question a).

i) Other, please specify:

End users should be informed about the negative impact of oversubscriptions of DSLAMs or fibre terminations for their sustained bandwidth. When the DSLAM or the fibre termination is overbooked and the Internet is used by all subscribers (as often is the case during peak times) the result will be network congestion. This information needs to be communicated to end users in clear and accessible language.

Question 13:

Some ISPs currently apply 'fair use policies', which give them wide discretion to apply restrictions on traffic generated by users whose usage they consider excessive. Do you consider that, in case of contractual restrictions of data consumption, quantified data allowances (e.g. monthly caps of x MB or GB) are more transparent for consumers than discretionary fair use clauses?

Yes. Quantified data allowances are indeed more transparent because this way it is easy to generate comparison tables, which enable end-users to decide which operators' service best fits their demands.

Question 14:

a) When should the elements of information referred to in question 12 be provided to the consumer by the ISP?

These elements of information need to be provided before signing the contract and regularly updated during the contract if changes occur (as is the case with a Service Level Agreement). An end user needs to be able to check whether the information included in his contract corresponds to the actual service delivered to him. For more information, we refer to our answers under question 12.

Question 15:

What would be the (additional) costs for ISPs to (i) collect the various data mentioned in the table in question 12 (e.g. measuring of average speed, jitter, delay etc.) and (ii) communicate the information to their customers. Please provide an estimate of the above costs for your own company or an ISP of your choice explaining your assumptions and methodology, and details about the technical tools used to collect the various data. If possible, please provide a breakdown of the costs.

Most of the data are available and can be easily added in contracts and real time (as also mentioned in our answer to question 12).

Question 16:

a) In order to promote transparency and consumer choice, do you consider it necessary that comparable data on the Internet access provided by ISPs is collected and published by NRAs or another independent organisation?

Yes. The EBU considers this necessary.

Do you think this information should be broken down by geographic areas or different data plans?

Yes.

Question 17:

a) Do you consider it necessary to regulate the labelling as "Internet access" of subscriptions that restrict access to some Internet services, content or applications?

Yes. The term "Internet access" should be reserved for offers which provide full access to services available on the Internet in order not to mislead end users.

b) If yes, which restrictions would be acceptable before a subscription could no longer be marketed, without qualification, as an "Internet access" product?

The term "Internet access" is not acceptable in case of offers of partial access to the services available on the Internet. So, as soon as access is blocked to specific services such as VOIP or video content, the offer could no longer be marketed as "Internet access." The qualification "Internet access" does not prevent operators from applying reasonable traffic management practices provided that they are limited to a minimum and that they are properly justified (see response to question 4 b)).

2.2 Switching

Question 18:

a) Please explain what barriers to switching ISPs still exist (if any) and how they can be overcome. Please mention in your reply all direct and indirect factors dissuading consumers from switching (e.g. obstacles linked to the terminal equipment, burden of proof regarding a possible breach of contract, etc.)

Access to the Internet is increasingly being perceived as a utility by consumers and businesses. Switching is not seamless as it can take a number of days or weeks. Increasing bundling of broadband services, with pay-TV and mobile services also hinders switching by consumers. The availability of real-time information would also empower the end user because it'd allow him to monitor the data connection and to make an informed decision about whether or not to switch operators. Easy switching opportunities are essential for creating an open and competitive market.

c) What actions by an ISP would constitute a breach of contract or modifications to the contractual conditions which would enable a consumer to be released from a contract?

When an ISP delivers poor services and does not live up to the agreed contractual terms and conditions. The EBU is in favour of mechanisms which would allow the end user to verify whether the ISP lives up to its contractual agreements. Hence, the importance of the availability of real-time information. (see response to question 12, c) and d))

d) Should customers be able to easily opt out from certain contractual restrictions (up to a completely unrestricted offer) by the same operator?

Where there is effective competition, it should be up to the operator to decide whether or not to offer any services.

e) Do you think that a customer should be allowed to switch to another operator within a reduced contract termination period in case his/her current operator does not at all offer an unrestricted Internet access product or does not allow switching to such unrestricted offer?

In case a contract is breached, it should indeed be able to terminate a contract from the very moment that the contractual conditions are not met anymore.

Question 19:

While there may be valid (technical) reasons why consumers do not always get the advertised service speed or quality, should there be a limit on the discrepancy between advertised and actual service parameters (e.g. speed)?

Yes. In case of professional contracts, these conditions are usually defined in service level agreements with promised uptime and potential derivation of that figure. On the bill of the next month this uptime could be displayed. This would be easily comparable with other service providers.

Question 22:

a) How important would be the benefits for end-users of improved transparency and facilitated switching?

Very important. It would place pressure on ISPs implementing restrictive practices and would ultimately serve the end-users' access to a good quality and reasonably priced best efforts Internet.

b) What would be the expected benefits in terms of innovation by new businesses (content or applications) as a consequence of improved consumer choice and increased competition between ISPs?

It would preserve the incentives for existing or new markets entrants to provide improved content and applications and it would offer greater choice for consumers.

3. IP interconnection issues

Question 24:

a) In your view, are there any problems regarding IP interconnection arrangements (between network operators, ISPs, transit providers and/or content providers) that could have an impact on the quality of the best effort Internet?

Yes. IP interconnection agreements have developed so far without any significant regulatory intervention. Today's arrangements reflect the best effort principle and have so far been crucial for the Internet's contribution to growth and innovation and for end-users to reach all destinations on the Internet. Public service media (PSM) acknowledge this: it is reflected in their engagement to secure the delivery of their content to the end-user with a range of intermediaries and in the fact that they pay for hosting, connectivity and CDNs. Specific attention needs to be paid to the case where an ISP that predominantly sells connectivity to content and applications users at retail level ("Eyeball ISP") deploys its own transit capacities

and long distance networks. In some cases, such an ISP has such a comprehensive network that it never needs to purchase transit agreements from other providers (“Tier 1 provider”). In this case, the Eyeball ISP’s market power increases at the interconnection level and provides the opportunity to use traffic management or even block traffic in order to pursue its own commercial interests at the expense of services competing with the ISP’s own services.

b) Are there any specific issues related to the vertical integration of ISPs and transit providers?

Yes. See answer to question 24, a).

Question 25:

Direct peering, Content Delivery Networks (CDN) or Quality of Service Interconnection (between ISPs and content providers) are being developed to propose an enhanced quality of service for content providers and end users.

a) What role can they play in reducing the risk of network congestion?

In its draft report “An assessment of IP-interconnection in the context of Net Neutrality”, BEREC concludes that there are different alternative mechanisms in the best efforts networks for improving end-to-end network performance (and therefore the QoE), including CDNs (page 49 of the draft report). The EBU very much welcomes this. In our view, congestion at interconnecting hubs is generally best prevented by caching popular content as deep as possible in the network. Other techniques that will help to do this are Open and Transparent caches and/or the possibility for CAPs to co-locate caches in third party networks.

Whereas we agree that the content providers’ scale influences the decision to buy or make CDN services, it does not necessarily imply that operating its own CDN would only be interesting for a global content provider. CAPs which mainly operate locally, such as public service media in a specific country or language domain, often have more/better peering relationships with local ISPs than global CDNs have. In that situation, a global CDN does not deliver interconnection advantages. This could make the scenario viable in the future for such a broadcaster to use their own CDN. At the same time, public service media in larger countries do not necessarily have more interconnections with ISPs than the global CDNs. They already use different CDNs to offload their content, optimising data flows by directing traffic to the CDN that has the best capacity at that moment in time. In these markets CDN-Overlays and CDN-Federations will become more important in the future.

b) What opportunities and threats do they constitute for:

(i) ISPs

For ISPs, the use of CDNs generates a better user experience due to the fact that content is cached directly into their network close to the end user and the overall improvement the rerouting of content has on the performance of Internet because less traffic has to travel via interconnecting hubs. Therefore consumers’ satisfaction levels with the ISPs traffic delivery improve.

(ii) content providers

For content providers the use of CDNs generates a better user experience due to the fact that content is cached directly into their network close to the end user. Therefore the content will be played out quicker and with less chance of interruptions.

(iii) transit providers

For Transit Providers the use of CDNs will lead to less congestion because less traffic has to travel via interconnecting hubs.

(iv) end users?

For end users the use of CDNs generates a better user experience due to the fact that content is cached directly into their network close to the end user. Therefore the content will be played out quicker and with less chance of interruptions.

c) Are there any barriers of a regulatory, technical or business nature that prevent market players other than ISPs from playing a more important role in reducing the risk of network congestion?

Yes. In terms of solutions, the EBU identifies a range of other advanced techniques to optimise data traffic in best efforts networks. We refer to our answer in question 4b).

4. Process

Question 26:

a) Do you consider that intervention by public authorities is necessary at this stage?

Yes

If so, what would be the appropriate level of such intervention?

The open Internet promotes “innovation without permission” and underpins fundamental rights such as freedom of expression and information. The European Commission should clearly state the importance of safeguarding the open and neutral Internet as a key policy aim of the Digital Agenda for Europe. There should be strong statements at both national and EU level in favour of net neutrality reflecting the fact that the openness and non-discriminatory features of the Internet are key in terms of innovation, economic efficiency and citizens’ access to information.

Such statements should in our view at least include the following principles and issues:

- As a matter of principle, no blocking of content by ISPs should be allowed
- The use of the term “Internet access” in marketing should be reserved to those services which provide unrestricted access to the open Internet
- NRAs should closely monitor the quality delivered on the best efforts Internet
- Enable NRAs to intervene whenever best efforts Internet is degraded to such an extent that it will trigger minimum Quality of Service requirements

- Differentiated treatment of traffic or differentiation of practices shall be allowed as long as the same types of services are treated equally
- Ensure that every EU citizen has access to a robust choice between Internet service providers. There needs to be a strong commitment to consumer transparency and minimal switching costs
- A commitment to ensure transparency and users' awareness about Internet access offers and traffic management and differentiation practices and to ensure users access to reliable and real-time information on traffic data
- Promote scrutiny by NRAs to address the risk of anti-competitive arrangements and prevent new forms of traffic discrimination to arise. This particularly includes addressing the risk that ISPs could degrade the best efforts Internet in order to advance their commercial interests through managed services
- A recognition that investment in additional capacity and advanced technical solutions for efficient traffic delivery should go hand in hand and are key to secure the open nature of the Internet
- Actively promote the use of advanced technical solutions for efficient traffic delivery on the open Internet (P2P in a real decentralised network, eMBMS on wireless broadband networks, multicast technique etc.)

Self-regulation and co-regulation have an essential role to play provided that they are backed up by an effective oversight mechanism which allows public intervention, whenever needed. Regulatory/legislative intervention at both national and European levels may be necessary to ensure the preservation of the open public Internet and the access to media services of general interest (i.e. public service media content) with "sufficient" quality of service, particularly in areas where self-regulatory or co-regulatory approaches prove not be sufficient for safeguarding the open Internet.

b) What would be the consequences of divergent interventions by public authorities in the EU Member States?

Any policy intervention in the field of net neutrality should be to safeguard an open and neutral Internet. Divergent interventions by public authorities in the EU could lead to a situation where a digital divide arises between different Member States. It is important that a robust Internet best-efforts access is available for all EU citizens regardless of their Member State of residence. Furthermore, we need to ensure a consistent effective implementation of the EU 'Telecoms' regulatory framework by all EU Member States.

Question 28:

Do you consider that regulators should monitor interconnection agreements between providers?

Yes. National regulators should indeed monitor interconnection agreements between providers because of the risk that some differentiation practices employed by ISPs that would lead to a violation of net neutrality principles may be reflected at the wholesale interconnection level in a departure from the best effort principle (BEREC, draft report on IP interconnection, 29.05.2012, page 8) Particular attention needs to be paid to the particular case where an ISP that predominantly sells connectivity to content and applications users at

retail level ("Eyeball ISP") deploys its own transit capacities and long distance networks and acquires such a comprehensive network that it never needs to purchase transit agreements from other providers ("Tier 1 provider"). In this case, the Eyeball ISP's market power increases at the interconnection level and provides the opportunity to use traffic management or even block traffic in order to pursue its own commercial interests at the expense of services competing with the ISP's own services.

Question 29: Under article 22(3) USD NRAs have the power to set minimum quality of service requirements on undertakings providing public communications networks. In a scenario where in a given Member State no unrestricted offer is available (for instance because all operators actually block VoIP), do you consider that the "minimum quality of service tool" should be applied by the NRA to require operators to provide certain unrestricted offers?

Yes. Imposing QoS requirements is an appropriate tool to address concerns related to a degradation of the quality of the best efforts Internet access. The European Commission should clarify when NRAs should intervene to safeguard a best efforts Internet.
