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CENTRE ON REGULATION IN EUROPE

Network Neutrality and the Open Internet

A European academic perspective

***Pierre Larouche (CERRE and Tilburg University) & Martin Cave
(CERRE and London School of Economics and Political Science)***

A CERRE response to the EC consultation

September 2010

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Centre on Regulation in Europe (CERRE) asbl
rue de l'Industrie, 42 (box 16) – B-1040 Brussels
ph : +32 (0)2 230 83 60 – fax : +32 (0)2 230 83 60
VAT BE 0824 446 055 RPM – info@cerre.eu – www.cerre.eu



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About CERRE

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CERRE's added value is based on:

- its original, multidisciplinary and cross sector approach;
- the widely acknowledged academic credentials and policy experience of its team and associated staff members;
- its scientific independence and impartiality.

CERRE's activities include contributions to the development of norms, standards and policy recommendations related to the regulation of service providers, to the specification of market rules and to improvements in the management of infrastructure in a changing political, economic, technological and social environment. CERRE's work also aims at clarifying the respective roles of market operators, governments and regulatory authorities, as well as at strengthening the expertise of the latter, since in many member states, regulators are part of a relatively recent profession.

It is therefore logical that CERRE responds to the public consultation launched by the European Commission on 7 July 2010 on the open internet and net neutrality.

This study has received the financial support of CERRE members. As provided for in the association's by-laws, it has been prepared in complete academic independence. The contents and opinions expressed reflect only the authors' views and in no way bind the members of CERRE (www.cerre.eu)

About the authors

Pierre Larouche is a joint Academic Director of CERRE, Professor of Competition Law at Tilburg University and Vice-Director of the Tilburg Law and Economics Center (TILEC), as well as Professor at the College of Europe (Bruges).

Before starting his academic career in 1996 at the University of Maastricht, Prof. Larouche clerked at the Supreme Court of Canada in 1991-1992 and practised law for three years in Brussels.

His teaching and research interests include competition law, telecommunications law, media law, basic Community law and the common European law of torts. He is one of the chief editors of the Journal of Network Industries. He has been a guest professor at McGill University (2002) and National University of Singapore (2004) and a senior fellow at Chicago's North Western University (2009-10).

Prof. Larouche is the author of more than fifty scientific papers published in reputable law and economics journals.

Martin Cave, OBE, is a joint Academic Director of CERRE and holder of the BP Centennial Chair at the London School of Economics and Political Science. He was until recently Director of Warwick Business School's Centre for Management under Regulation. He is an economist specialising in the regulation of sectors such as airports, broadcasting, housing, legal services, posts, telecommunications and water.

Prof. Cave has been heavily involved in providing advice on these matters to the UK and other governments and to the European Commission. His independent review of the regulation of social housing for the UK Department of Communities and Local Government formed the basis for the creation of the new Tenant Services Agency by the Housing and Regeneration Act 2008. Advice in his earlier reviews of spectrum management for the Treasury has been adopted by the Government.

He has recently conducted a review of competition and innovation in the water industry and chaired an expert panel advising the Secretary of State for Transport on the future of airport regulation

Executive summary

The term ‘network neutrality’ covers a number of distinct issues. In the short term, Internet Service Providers (ISPs, the firms providing broadband access to the Internet) must take measures to deal with imbalances and congestion on their networks. Beyond that, in the longer term, ISPs are looking to introduce differentiated Quality of Service (QoS) offerings: they would turn their services to a two-sided platform, where a given QoS level (in terms of priority and other technical characteristics) could be purchased by users, on the one hand, and content, application and service providers, on the other hand.

From the perspective of **competition policy and sector-specific regulation**, an assessment of this evolution requires an analysis of two markets (broadly defined), namely those of content provision (including services and applications) and broadband access to the Internet.

At the *content provision* level, market power could arise when a content provider holds ‘must-have’ content; yet such market power does not typically rest on a structural advantage such as a bottleneck. Should a content provider hold significant market power/dominance, it might seek to exclude rival content providers via exclusivity arrangements with ISPs, but it is unclear why an ISP would accept to enter into such an arrangement, which would reduce the attractiveness of its platform. In any event, competition law is sufficient to deal with such issues.

At the *ISP* level, significant market power could exist either vis-à-vis an ISP’s own users (because these users can only access the Internet via their ISP) or vis-à-vis content providers (because they can only reach users via each user’s ISP).

Vis-à-vis users, the ability of users to switch to another ISP – which is enhanced by wholesale broadband access regulation in the EU – acts as a brake on any market power on the part of the ISP. In any event, both sector-specific regulation and competition law are available to deal with any exploitative abuse which could arise.

Vis-à-vis content providers, one could think of the ISP as occupying a position similar to that of a terminating telecommunications operator (which is typically found to hold significant market power on the market for terminating communications to its subscribers). But this analogy is imperfect, since users typically access the Internet via many different routes: fixed broadband at home and at work, mobile access, wi-fi hotspots and others. There is a widespread concern in the literature that an ISP with market power would integrate vertically into content or seek exclusivity deals; it would then engage into discrimination against, or even blocking of traffic from, non-affiliated content providers. Yet ISPs have little economic incentive to do so. Even then, competition law is available to deal with such conduct should it arise. Provided that a relevant market is added to the Recommendation on relevant markets susceptible to ex ante regulation, the SMP regime could also be used to deal with such an issue.

Beyond that, the introduction of a transparency obligation in Directive 2009/136 will improve the functioning of the market for broadband access. Recent experimental evidence indicates that this obligation can be welfare-enhancing, and points to various implementation options (full information to a subset of users, partial information to all users). More research is needed, but we would suggest looking into innovative QoS measurements such as third-party benchmark indexes.

We conclude that no additional legislation is needed to deal with market power issues. However, sufficient resources must be devoted to monitoring and enforcement if existing legislation (competition law and sector-specific regulation) is to work effectively.

In addition to market power issues, a very basic policy concern is whether differentiated QoS should be allowed at all. Economic arguments point to benefits arising from the introduction of differentiated QoS, as well as potential risks. At the time being, on a proper view of the evidence, **there is no case for an intervention to prohibit differentiated QoS altogether**. More specifically, there is no reason and no legal basis to construe discrimination more broadly than under competition law (discrimination by a dominant ISP as between *firms* in a similar position, with an anti-competitive effect) or the internal market (discrimination based on nationality, residence or establishment).

However, depending on which of three possible scenarios materialize, it is possible that the introduction of differentiated QoS by ISPs would lead to a fragmentation of the **internal market**, because QoS platforms would be primarily national. For the time being, monitoring is warranted. As it becomes clearer how differentiated QoS is introduced, there might be room for a light-touch intervention to prod the market towards a sufficient level of standardization to ensure that the Internet continues to benefit the internal market. By the same token, if NRAs should decide to intervene to impose minimum QoS requirements, coordination at EU level is highly advisable.

Amongst regulatory options alluded to in the Questionnaire, we strongly advise against creating a legal distinction between ‘managed services’ and ‘the public Internet’, since this would put the former in a regulatory straitjacket and impair innovation.

General introductory remarks

Before going into the Commission questionnaire, it is crucial to set out a number of key points which inform the rest of this contribution.

The need to reflect upon network neutrality in a European context

The network neutrality debate comes to Europe from the US. Already in the course of the review of the electronic communications regulatory framework, in 2007-2009, many commentators cautioned against holding a mere repeat of the US battle in the EU.

The situation in the EU is different. On the ground, the electronic communications markets are not structured in the same way as in the USA, for historical, geographical and economic reasons. At the policy level, the EU has set on its own course with the 2002 regulatory framework. Contrary to the USA, the EU moved away from technology-based regulation towards technology-neutral, economics-based regulation. Furthermore, policy choices on fundamental issues such as the balance between infrastructure- and service-based competition have differed across the Atlantic.

In a number of instances (including Questions 1, 2, 3, 5 and 8), our reply to the Questionnaire points to European specificities which command that the terms of the US debate not be taken over without question.

The need to base regulatory policy on economics

In general, the Questionnaire pays heed to economics, but sometimes it also ventures into pure technological discussions. We consider that one of the key achievements of the 2002 regulatory framework has been to shift sector-specific regulation away from a technological towards an economic foundation, with the emphasis on market analysis, the three-criteria test for the selection of markets, the assessment of significant market power and the use of remedies borrowed from competition law. As pointed out in the previous paragraph, this is also one of the distinctive features of EU regulation when compared to US regulation.

Accordingly, throughout this contribution, we endeavour to provide at least a short economic analysis of the issues. The bulk of the analysis is under Questions 1 and 2. As is often the case, it tends to show that policymakers overlook the fact that certain potentially detrimental outcomes are unlikely to eventuate, because of a lack of incentives to engage in them or because of competitive pressures.

The need to take competition law into account

Building on the previous point, the Questionnaire seems to overlook that competition law is always applicable to the electronic communications sector. Before any additional public

intervention through specific regulation, it is crucial to assess whether competition law would not suffice to address the issue identified.

In our answer to Question 3, in particular, we emphasize the role of competition law in addressing any network neutrality issues which may arise.

Network neutrality as a cluster of issues

The ‘network neutrality’ moniker has some advantages, but it also affects the thrust of the discussion. First of all, it creates an illusion of unity among a number of disparate questions and oversimplifies the debate into a battle between proponents and opponents of ‘network neutrality’. Secondly, it isolates the discussion from broader social and economic issues and turns it into what seems like an Internet-specific technological confrontation.

We take issue with both trends. Network neutrality is but a convenient label; if a serious public policy discussion is to be held, then the various issues brought under network neutrality must be kept in mind throughout the analysis. Accordingly, the result will likely be more nuanced and complex than many participants in the debate would like. Furthermore, history did not start with the Internet, and the Internet does not operate outside of society, the economy and law.

Let us begin with taking apart the network neutrality cluster. The one red line running through the whole cluster is that the providers of broadband access to the Internet – hereinafter the ISPs¹ – are seeking to change their role and their operations. Beyond that, we find that at the outset, two broad issues must be distinguished:

- (i) Shorter-term *network management* issues, where ISPs are experiencing traffic imbalances and congestion on their respective networks because of the growth in capacity requirements from users (at least from some users) and where ISPs are also facing calls for them to exert greater control over the traffic they carry;
- (ii) Longer-term issues about the evolution away from the current best-efforts model towards *differentiated Quality of Service (QoS)* offerings from ISPs.

This distinction is key, since even if network management continues to follow the best-efforts model, the shorter-term issues will remain and need to be addressed.

Shorter-term network management issues

Most ISPs have observed the following usage patterns on their network: a small fraction of users (usually less than 10%) account for a disproportionate amount of traffic (usually more than 80%).

¹ We use ISP (Internet Service Provider) because it is the most commonly-used term even though its meaning has evolved since the early days of the Internet. ISP now stands for a class of firms which includes the traditional telecommunications operators providing broadband over ADSL or fibre, the cable TV operators providing broadband over cable, as well as mobile communications operators providing access over 3G technology and other operators (satellite, etc.).

A number of factors contribute to this, including the rise of peer-to-peer (P2P) networking and concomitant applications, but also the popularity of online games (MMORPGs and others) and the growth in the distribution of high-quality video over the Internet. Such usage patterns can negatively affect the quality of operations of the ISP and the experience of other users, and accordingly ISPs have been trying to find ways to keep usage patterns in check.

A possible remedy is to charge high-traffic users more or impose traffic limits which will catch such users,² but that is not always commercially feasible. Other measures of a more technical nature are also available: they imply that ISPs look more closely into the content of the data packets they are carrying,³ in order to impose a differential treatment on the traffic streams which are thought to create network management problems. For instance, the transit of such traffic streams can be delayed in order not to affect traffic from other users or it can be blocked altogether.

The problem with such technical measures is that they are hard to target accurately and can have an impact on the functioning of the market. Such was the case in the US when Madison River cut off Voice-over-IP traffic or Comcast hampered P2P traffic. In both situations, the actions of the ISP also adversely affected actual or potential rivals in the provision of voice communications (Madison River) or content (Comcast). These two cases fed the calls for intervention on 'network neutrality', but one should be careful not to overreact.

From a public policy perspective, the shorter-term management issues faced by ISPs give rise to a concern that network management measures would be used for anti-competitive purposes, in particular to exclude rivals on upstream markets (for content, applications or services) from access to the customers of an ISP. While it might on the surface appear sufficient to restrict ISPs to pricing and usage limits and prevent them from having recourse to technical measures, this would not be consistent with trends elsewhere in policy and in the law, whereby ISPs are increasingly called upon to police traffic on their networks.

Such policing takes place not just in support of criminal law enforcement, but also, and increasingly in order to protect intellectual property.

Longer-term issues: differentiated QoS

In the longer term, other issues arise.

² I.e. set the traffic limit (in terms of GBs per month, for instance) at such a level that the vast majority of users will not reach it.

³ To the extent that this is legally feasible.

First of all, demand for bandwidth-hungry content, services or applications⁴ with exacting quality requirements – high-definition video-on-demand, gaming, telemedicine, videoconferencing – will increase, and content providers are ready to offer such content.

From the side of content providers, questions arise as to whether the current best-efforts routing model can adequately support such content. ISPs would have incentives to invest in their networks in order to deliver on the requirements of users and content providers.

However, broadband Internet access is on its way to becoming a commodity product, with decreasing prices (monthly rates with high or no usage limits having become the norm) for increasing bandwidth and speed. In principle, customers welcome this development, at least from a static perspective; yet over time, ISPs are challenged to find the income streams required to carry out the investments needed to meet the quality requirements of customers and content providers.⁵

Among the solutions to escape this conundrum,⁶ ISPs can pursue a strategy of horizontal differentiation and turn their services from a mere conduit for content to a two-sided platform, i.e. a platform where content providers and users can interact. In order to do so, the ISP must offer a service which stands out from standard traffic conveyance and attracts users and content providers to its ‘platform’. Hence the idea of endowing the ISP’s network with certain features which make it stand from the rest, i.e. offering a level of Quality of Service (QoS) going beyond best-efforts by including prioritization (which in turn will influence more technical aspects such as latency or jitter).

Since this is a longer-term development, it is still quite unclear how it will unfold technically and commercially.

Accordingly, some policy concerns can be hinted at, but it is quite early to assess how warranted they might be. They are developed further in the course of answering the Questions, in particular Question 2.

⁴ Hereafter collectively referred to collectively as ‘content’ for the sake of simplicity.

⁵ The costliest part of such investment programmes is the roll-out of fibre optic into the access network, be it all the way to the curb (FTTC) or even into individual homes (FTTH).

⁶ Other solutions include expanding revenue per customer by selling product bundles – triple play, quadruple play – or introducing new ancillary services, which typically brings ISPs to integrate vertically and compete with content providers.

Question 1: Is there currently a problem of net neutrality and the openness of the internet in Europe? If so, illustrate with concrete examples. Where are the bottlenecks, if any? Is the problem such that it cannot be solved by the existing degree of competition in fixed and mobile access markets?

The authors of this report, in their quality as academics, are not in a position to provide first-hand qualitative evidence on the prevalence of the concerns laid out above. Of course, there is anecdotal evidence, as mentioned in the Questionnaire.

This does not prevent a prospective competitive analysis from being made, in order to answer the latter part of this question. This involves, firstly, identifying where significant market power could arise, and secondly, assessing the likelihood that such market power could be abused (or that collusion could occur).

1.1. Market power

In a nutshell, without wanting to conduct a detailed relevant market analysis, network neutrality can be brought back to a vertical relationship between content providers and ISPs, taking into account the fact that the ISP services are or can be a two-sided platform between content providers and end-users. Market power could arise either at the level of content provision or at the ISP level.

1.1.1. Market power at the content provision level

At the content provision level, market power could arise for the provision of various types of content (or applications or services), so that the content in question would qualify as a “must-have”. For instance, it is hard to imagine an ISP not offering access to Google. Yet market power at the content level does not usually rest on a structural advantage such as a bottleneck. Typically it relies on intellectual property (in respect of which competition law is the first port of call).

1.1.2. Market power at the ISP level

1.1.2.1. Market power vis-à-vis users

At the ISP level, market power can arise because the ISP controls traffic to and from its end-users. Indeed, at any given location and point in time, an end-user depends on an ISP – to which it is linked – to exchange traffic on Internet. This might be the cable or ADSL provider from which one procures broadband access, the mobile operator to whose services one subscribes or even a wi-fi hotspot operator to whose network one is connected. Traffic between the Internet and the specific device one is using is routed through that ISP and through that ISP only.

From the end-user/customer perspective, the ability to switch from one ISP to the other acts as a check on the ISP developing significant market power. Switching can occur not

only between ISPs directly competing with one another (e.g. between DSL- and cable-based ISPs, or between mobile operators), but also between a fixed-line ISP (DSL- or cable-based) and a mobile operator, albeit in the latter case the services are not entirely substitutable.⁷ As always, for suppliers to be disciplined, it is not necessary for all customers to switch, but a sufficient number must be prepared to switch make it unprofitable for the ISP to raise prices.

1.1.2.2. Market power vis-à-vis content providers

Market power can also be felt in the other direction, however. For the content provider, the end-user can only be reached via whichever ISP the end-user is connected to. The content provider is not necessarily in a direct relationship with the end-user's ISP,⁸ and furthermore, the content provider cannot influence⁹ the end-user's choice of ISP. In that sense, the ISP could find itself in a similar position to the fixed or mobile voice operator on the termination market: the competitive analysis in recent years has coalesced around the approach that each termination network operator finds itself in a separate relevant market as regards its own network, implying that the operator holds significant market power as regards termination.

Yet one should not rush to conclude by analogy that ISPs hold significant market power towards content providers because they control access to their end-users.

Whereas for fixed and mobile telephony end-users are genuinely reachable only via their operator, Internet traffic can reach the end-user via many different routes: end-users might have a cable/DSL subscription at home, a 3G subscription with access to the Internet via their smartphone, access to the Internet at work via their office network, plus sporadic access via a wi-fi hotspot. These access routes are not equivalent or interchangeable from a content provider's point of view,¹⁰ but nevertheless they moderate any market power that an ISP might have towards content providers by virtue of their control of access to the end-user.

1.2. Likelihood of abuse

1.2.1. Likelihood of abuse – Content provision level

Having seen above that market power could perhaps arise (but not necessarily), the next question is whether there is likelihood that abusive practices would occur, such as could justify either sector-specific regulation or trigger the application of competition law.

As far as any content provider with significant market power is concerned, it could seek to

⁷ Bandwidth, speed and – obviously – mobility differentiate fixed-line from mobile broadband access.

⁸ See also *infra*, headings 2.2.2. and 2.2.3.

⁹ Or at least cannot influence immediately.

¹⁰ Fixed and mobile access are not equivalent, access via the employer's network might be subject to restrictions.

obtain from one or more ISPs commitments¹¹ to exclude rival providers. Although this might be a profit-maximising strategy in specific circumstances, it is unclear why an ISP would agree to do so, since the ISP would thereby decrease the value of its platform in the eyes of end-users. Less drastically, a content provider in a variable QoS world might insist on having a QoS advantage over its rivals, but from the ISP's point of view, degrading the QoS of rival content in this way would be just as disadvantageous as excluding such content.

1.2.2. Likelihood of abuse – ISP level

1.2.2.1. Towards users

The ISP could also seek to exploit a position of significant market power by charging excessive prices for a given level of QoS or excessively lowering the QoS in the default option.¹² This is only feasible if the ISP customers are captive (which is unlikely) and it depends on the elasticities of demand applying to the various services.

1.2.2.2. Towards content providers

For ISPs, of course, the main concern voiced throughout the literature has centred around exclusionary practices that could follow from vertical integration into content provision, or the conclusion of exclusivity agreements whereby content providers would not deal with rival ISPs. This would lead to a situation whereby some content would only be available on a specific ISP. That would enable the ISP to enhance the attractiveness of its two-sided platform¹³ at the expense of competing ISPs. The more desirable the content is ('must-see' content), the more attractive it would be for an ISP to have exclusivity on it. At the same time, for 'must-see' content, the upstream loss in revenue at content level from taking the content away from rival ISPs is certainly much greater than the downstream gain at ISP level, so that offering such content exclusively on one ISP makes little economic sense. Accordingly, the incentives for an ISP to seek content exclusivity are probably weak.

Beyond content exclusivity (and on the assumption that it would somehow make economic sense), the ISP might even want to exclude rival content and create a so-called 'walled garden', whereby its customers only have access to the content exclusive to the ISP. The historical evidence is stacked against such an approach: content distribution has always tended to be done via distribution channels that offered the widest array of content, in line with the predictions from the economics of two-sided platforms.¹⁴ Economically,

¹¹ Or otherwise behave towards ISPs so as to achieve that goal, for instance by purchasing all or most available capacity at high-level QoS. Vertical integration by purchasing an ISP in order to exclude rival content providers appears very unlikely, given the costs involved for the content provider compared to the expected returns.

¹² The latter hypothesis would turn the basic Internet into the famed 'dirt road' alluded to by proponents of network neutrality regulation.

¹³ Note that an ISP could also voluntarily give preference to certain content, even in the absence of vertical integration, in order to enhance the attractiveness of its platform (i.e. 'the best-performing network for online games').

¹⁴ Think of bookstores and record stores. In more recent times, the efforts of AOL and CompuServe to offer walled gardens in the early days of the Internet were abandoned after it became clear that customers wanted no restrictions on access. Cable TV bucked the historical trend, but there the distributor has a total monopoly.

this makes little sense either, to the extent that cutting off rival content providers leads to minimal savings upstream and is likely to cause a greater loss of revenue through the erosion of the downstream subscriber base, in view of the reduced attractiveness of the ISP's two-sided platform.

1.3. Conclusion

On the basis of a summary competitive analysis, issues could arise at the content provision or the broadband access (ISP) level.

At the content provision level, market power could arise when a content provider holds 'must-have' content, yet such market power does not typically rest on a structural advantage such as a bottleneck. Should a content provider hold significant market power/dominance, it might seek to exclude rival content providers via exclusivity arrangements with ISPs, but it is unclear why an ISP would accept to enter into such an arrangement, which would reduce the attractiveness of its platform.

At the ISP level, significant market power could exist either vis-à-vis an ISP's own users (because these users can only access the Internet via their ISP) or vis-à-vis content providers (because they can only reach users via each user's ISP).

Vis-à-vis users, the ability of users to switch to another ISP acts as a brake on any market power on the part of the ISP.

Vis-à-vis content providers, one could think that the ISP is in a similar position as a terminating telecommunications operator (which is typically found to hold significant market power on the market for terminating communications to its subscribers). But this analogy is imperfect, since users typically access the Internet via many different routes: fixed broadband at home and at work, mobile access, wi-fi hotspots and others. Should there be market power, a widespread concern in the literature is that ISPs would integrate vertically into content or seek exclusivity deals, and then engage into discrimination against, or even blocking of traffic from, non-affiliated content providers. Yet ISPs have little economic incentive to do so.

Question 2: How might problems arise in future? Could these emerge in other parts of the Internet value chain? What would the causes be?

As the above indicates, there is a link between the intensity of ‘network neutrality’ concerns and the competitiveness of the market(s) for broadband access (fixed, mobile or otherwise). To a large extent, the US administration (read the FCC under the Bush administration) created the network neutrality debate in 2005 when it decided to lift the regulation of broadband access markets in order to move to a strict infrastructure/platform competition approach, whereby a local duopoly of rival platforms based on cable and DSL would be pitted against each other, with mobile eventually joining as a competitive alternative. The reduction in the number of competitors on the broadband access market increased the risks related to network neutrality, as the FCC itself immediately recognized upon announcing its policy in 2005.¹⁵

In the EU, broadband access markets tend to be more competitive, in the sense that a larger number of competitors are typically active on each market. Keeping access markets competitive might be the best insurance policy against the need to intervene to address network neutrality concerns (with all the attendant risks).

2.1. Desirability of differentiated QoS offerings in general

Beyond these competitive concerns, a more fundamental issue looms, that is whether it is desirable to allow ISPs to move away from best-efforts towards more differentiated QoS offerings.

2.1.1. Starting point – static analysis

As set out above, the ability of ISPs to charge appropriately for services is crucial to the very large programme of investment under way in Europe and elsewhere to take fibre closer to the home and to provide business and residential customers with the high-speed broadband services which are essential to fulfil many countries’ ambitions in the field of creating a knowledge economy. The current economic situation makes this difficult enough, and unnecessary restrictions on quality of service levels will delay the investments necessary to build such networks.

¹⁵ *Appropriate Framework for Broadband Access to the Internet Over Wireline Facilities et al.*, CC Docket Nos. 02-33, 01-337, 95-20, 98-10, GN Docket No. 00-185, CS Docket No. 02-52, Policy Statement, 20 FCC Rcd 14986 (2005) (*Internet Policy Statement*).

From the perspective of standard economic analysis, we can say that tailoring quality of service provided in a competitive environment more closely to the needs of each user is likely to improve welfare, and should also improve the incentives of ISPs to invest to meet customer demand.¹⁶

The simplest case is one where the characteristics of certain data flows necessitate delivery of information to a specified standard. Thus an email can normally be delayed for a few seconds without disaster. But a telephone conversation has to have a beginning, a middle and an end, in that order, as does a streamed video. It would be absurd to prohibit different charges per bit for service with different requirements, as doing so could eliminate certain the possibility of certain service being provided altogether.

Now consider another case: a particular end user needs emails delivered instantaneously, while other end-users are prepared to wait. Is it wrong to charge more for an express service, which imposes more cost on the network? To the contrary, failing to do so may cause the express service to disappear altogether as everyone might sign up for it if it were free.

In this respect, the Internet is similar to other content delivery networks, such as the postal network, or from transport networks (in particular rail and road networks). On these networks, it is possible to offer differentiated QoS (faster lanes, priority, express delivery, etc.), and there is general agreement that such differentiated QoS improves welfare.

2.1.2. Broadband access as a two-sided market

There is, however, an important additional complication, arising from the fact that we are dealing here with a two-sided market, where one or more ISPs stand between content providers on one hand and end-users on the other.

Content providers have the opportunity to fund themselves either by the sale of advertising or by the sale of content to end-users. ISPs can in principle attract payments from either or both of end-users and content providers; and they may pay content providers to come onto their platform, possibly on an exclusive basis, in order to make themselves more attractive to end-users.

One of the chief things we know about two-sided markets, is that they overturn conventional views about efficient pricing.¹⁷ For example, parties imposing the same costs of providing a service need not pay the same prices if they are on different sides of the market, and for that reason have different externality effects.

¹⁶ According to our reading of the economic literature, the consensus is squarely in favour of allowing price and quality differentiation. There are exceptions, however, most prominently exemplified by N Economides 'Broadband openness rules are fully justified by economic research', Working paper 10-02, www.NETinst.org. In this paper, the work is mainly done by the assumption of limited network competition. For an overall review of the economic literature on net neutrality, see F Schuett, 'Network neutrality: a survey of the economic literature,' Review of Network Economics, 9(2) 2010.

¹⁷ See OECD, *Two-Sided Markets*, Roundtable on Competition Policy, DAF/COMP(2009)20 (2009).

As a general rule, in two-sided markets, the benefit that one side of the market obtains from access to the other side is directly related to the number of parties accessible on the other side. This makes a content provider value a platform on the basis of how many end-users it would have access to through that platform, and platform to value content on the basis of how many end users it can attract to the platform by providing that content. This is shown very clearly in ‘old’ media markets where a cable or satellite network will charge some channels for carriage, while it will pay others to come onto its network.

These considerations should be enough to alert us to the fact that *a priori* elimination by regulation either of any price discrimination or of payment flows in particular directions is unlikely to be beneficial.

2.1.3. Dynamic perspective and innovation

The above discussion was made from a static perspective. Some general arguments *a priori* have been made about the links between the current status of the internet and the encouragement of innovation.¹⁸ It is possible that moving away from the current best-efforts model could change the pattern of innovation on and around the Internet, in ways that are hard to predict. Without doubt, under the current best-efforts model, with the end-to-end principle, the Internet has been a hotbed of innovation. Whether and, if so, how strong a causal link exists between this model and innovation remains unknown, however. After all, the current model was not designed and chosen with a view to maximize innovation: rather, it was the product of US regulatory constraints at the time, as much as anything else.¹⁹

With competitive markets for content and for access, it is difficult to predict whether regulatory constraints on the development of new services will foster innovation or rather impair it.

It is thus important not to pre-empt the market by telling ISPs how to carry on their business before we know what the risks are. In other words, at such an early stage, legislative intervention should be limited to clear and identifiable risks that are not otherwise addressed by current laws and regulations. In any event, should the introduction of differentiated QoS lead to undesirable outcomes, it should be possible to intervene to revert to best-efforts (or another model) later on: the technical changes involved are limited.²⁰

¹⁸ For an anti-net neutrality view, see, for example, Christopher Yoo, ‘Network neutrality, consumers and innovation’, University of Chicago Legal Forum, 25, 2008, pp 179-262.

¹⁹ Following the *Computer* inquiries, the FCC had found that the AT&T monopoly did encompass the transmission of data without any processing or ‘basic services’, but did not extend to ‘enhanced services’ (‘information services’ under the Telecommunications Act 1996) whereby data was processed. The best-efforts model and the end-to-end principle are moulded around these constraints, in order to create a competitive space around data transmission.

²⁰ In fact, the main problem with a subsequent intervention to regulate QoS over the Internet would rather be to change mentalities and expectations, once market players and customers get used to differentiated QoS offerings.

As a matter of regulatory policy, there should be a strong case for intervening in such a radical way as to prohibit the introduction of differentiated QoS offerings. At this point in time, that case has not been made.²¹

2.2. Implementation of differentiated QoS in Europe and impact on the internal market

This is not to say that the introduction of differentiated QoS is not fraught with risks. The main one, in fact, has so far been overlooked in the discussion, most likely because it is still too influenced by US debates. It concerns the internal market, more so than competition.

2.2.1. Technical implementation of differentiated QoS

At this stage, it is unclear how differentiated QoS would work technically. As we know, the Internet is in fact a network of networks, and the best-efforts model is probably the easiest way to manage the routing of traffic across these networks.

So far, the history of QoS over the Internet is rather patchy. Some services aiming at improving the QoS are already available. Virtual Private Networks (VPNs), for instance, represent a break from “neutrality”, although they are not used primarily for prioritisation or QoS reasons.

Another “better than best efforts” service is currently offered in the form of caching content on servers closer to customers, which can thus be served more quickly and efficiently. At applications level, buffering for audio and video streaming is another example of improving QoS: audio and video files can avoid jitter by downloading every frame few seconds before showing it.

More to the point, prioritization has been trialled with certain protocols such as Diffserv, IntServ and others, which have been developed to treat content in a differentiated way. However, they require a lot of coordination to work with a multi-network environment. For the time being they only work well when applied to a small number of networks under the same administrator.²² The experience with DiffServ and other protocols points to the major obstacle to implementing differentiated QoS in practice, namely coordination between the various ISPs and network operators through whose facilities traffic must pass.

²¹ It is worth noting that Ofcom has reached the same conclusion in its discussion document Traffic Management and ‘net neutrality’ (2010).

²² See the article by Andy Oram “The Network Neutrality Debate: When the Best Effort Is Not Good Enough” at http://www.praxagora.com/andyo/ar/network_neutrality_best_effort.html, 28 June 2006.

2.2.2. The need for end-to-end QoS offerings and the coordination problem

Yet differentiated QoS only makes sense as a commercial proposition if it can be offered *end-to-end*, i.e. if the traffic is prioritised in the same fashion throughout the whole of its transmission between, say, the content provider and the end-user.

ISPs can prioritise “premium” packets and slow down lower-priority packets only on those parts of the transmission over which they exert control.²³ For the rest, they are dependent on their fellow providers (with whom they also compete for customers).

We find here a classical *coordination* problem, but the players have complex incentive patterns. Existing literature concerns mostly interconnection: interconnecting networks is mutually beneficial to the customers of both operators,²⁴ without obvious drawbacks for these customers (given the internalisation of network externalities) other than the cost of the facilities used to provide interconnection. Accordingly, operators generally have an incentive to interconnect with their competitors. Prioritization differs from interconnection in one important respect, however: it is rival. Just as we cannot all have an above-average income, so the customers of all ISPs cannot all be at the head of the delivery queue. When an ISP cooperates with another ISP to achieve end-to-end QoS levels for their respective customers, it is conferring benefits to customers of a competitor, potentially at the expense of one’s own customers.

In other words, by enlarging the set of customers who receive a high-level QoS end-to-end over their two networks, the two ISPs are diluting the value of this QoS level. Technically, they also render it less meaningful: if everyone has top-tier QoS, then no one has it.

The coordination problem is compounded by a further difficulty: differentiated QoS can be applied to both ends of the communication. An ISP may of course charge its subscribers (end-users) for priority and QoS, so that they can have a more enjoyable experience. Similarly, a content provider may be charged for differentiated QoS as well. The preferences of the two ends must then be reconciled. If an end-user pays for the highest QoS level in order to access relatively small content providers who have chosen for a lower QoS level, the result might not meet expectations. If the same end-user rather wants to access large content providers which have purchased gold-plated QoS in any event, perhaps overcharging has taken place.

2.2.3. Possible scenarios to address the coordination problem

Given this coordination problem, the following scenarios are possible:

²³ This is consistent with the fact mentioned above that protocols such as Diffserv only work well when the few network involved in content management are controlled by the same administrator.

²⁴ Assuming networks of comparable sizes.

Scenario 1. Dissolving the cloud single-handedly. A first option is to seek to exert control over the whole of the transmission process, i.e. dissolving the “cloud”. For instance, if a single ISP deals with both the content provider and the end-user, chances are that it can offer an end-to-end path over its own facilities, over which it can of course implement differentiated QoS. This solution seems quite at odds with the nature of the Internet as a public network, and it is actually outside the Internet as we know it. If ISPs pursue this avenue, then in fact they are building (or slicing off) a series of “special Internets” for their premium customers, leaving perhaps a small “traditional” Internet for the rest.

Scenario 2. Forming a coalition to dissolve the cloud. If it is not possible for a single firm to exert end-to-end control, then ISPs must cooperate, via agreements. In a simple two-firm, two-customer model as outlined above, there might not be much incentive to cooperate, but in an environment with more firms, it might be tempting for a number of them to pool their resources so as to be able to offer end-to-end QoS guarantees to their customers, knowing that this gives them an advantage over other competitors. Here also, this implies creating a sort of “private network” besides the Internet.

Scenario 3. Pretending that the cloud is dissolved. If neither of the previous two scenarios materialises, the coordination problem remains unsolved, and ISPs are promising something they cannot in fact deliver. They can only degrade service for those who do not pay for priority every time their content happens to pass through the realm where the ISP exerts control over routing. QoS charges are then akin to termination fees. As some have pointed out, such a course of conduct smacks of extortion.

2.2.4. Differences between the US and the EU

While it is too early to know how the introduction of differentiated QoS will unfold, there is a chance that the US and the EU would go in different ways. In view of the consolidation which took place in the US in recent years, not only is there more often than not a duopoly at local level, but the number of players at national level is very limited: the three surviving local incumbents²⁵ control more than 80% of telecom subscriptions nationally, and the leading five cable TV providers,²⁶ more than 70% of cable TV subscriptions. To this one must add four national mobile providers, two of which are owned by incumbents in any event. These players are also active on the Internet backbone (the cloud) and thus belong to the core of the Internet. They are most likely in a position to follow Scenario 1 and implement differentiated QoS on their own facilities.

In contrast, in the EU, at the local level there will tend to be more than two providers of fixed broadband²⁷ and up to four or five mobile operators.²⁸ While these players will typically be active in the whole of a Member State, at EU level broadband access

²⁵ AT&T, Verizon and Qwest, which result from the re-merger of the entities which had been created when the old AT&T monopoly was split in 1982.

²⁶ Comcast, TimeWarner, Cox, Charter, Cablevision.

²⁷ New entrants using their own networks, ULLs, bitstream or resale account for a significant portion of DSL subscriptions in the EU.

²⁸ Not including MVNOs and resellers.

provision remains essentially fragmented along national lines, even if every operator follows the same best-efforts model.²⁹ So there is limited hope of a single operator being able to offer end-to-end guarantees at a pan-European level.

For the EU, if Scenario 1 materializes, it will do so at Member State level. Such a scenario would create significant difficulties for content providers with global brand names or ambitions, who wish to attach a global QoS image to their services. In order to be able to offer a consistent QoS across the EU, they would have to enter into agreements with hundreds of ISPs in order to achieve the required QoS level for all potential end-users. This is a much more complicated proposition than in the USA.

Alternatively but perhaps less likely, Scenario 2 could be pursued at EU level, with networks of ISPs forming to offer an EU-wide set of differentiated QoS product. The agreements needed to achieve these networks could have anti-competitive effects, especially towards ISPs which would remain outside of any network.

In the end, the main difficulty is that we do not know yet how differentiated QoS will be achieved technically, i.e. which technical solutions will be put in place and which commercial possibilities these solutions will open. As mentioned above, there is no reason to intervene radically against QoS as such.

In the EU context, however, there is every reason to monitor closely the development of differentiated QoS. So far, the Internet has proven a massive boost for the internal market, because it made cross-border communication so easy, since all operators use the same standardized technology.³⁰ If differentiated QoS is introduced by way of proprietary solutions for each ISP, there is a risk that (i) the spread of differentiated QoS offerings will be slower in the EU than elsewhere due to the large number of ISPs which large content providers must deal with³¹ and (ii) the Internet will gain a more national flavour, with variation in QoS offerings along national lines. There is no guarantee that ISPs will spontaneously move to reduce that risk along the lines of Scenario 2, and even then Scenario 2 could have anti-competitive implications.

²⁹ There is some consolidation in the mobile sector with a number of pan-European groups, but their operations remain broken down along national lines.

³⁰ The standardization efforts underpinning the Internet took place to a large extent via private standardization organizations, some of them relatively informal. That does not affect their significance.

³¹ Of course, there are far fewer network equipment and software vendors than ISPs, so in principle even if each ISP implements differentiated QoS on a proprietary basis, the diversity of implementations will be constrained by number of available solutions from those vendors.

2.3. Conclusion

At this point in time, there is no case for intervention to prohibit differentiated QoS altogether. As the technical picture becomes clearer, there might be room for a light-touch intervention to prod the market towards a sufficient level of standardization to address the risks above. Such standardization must be limited to technical aspects only. It is up to each ISP to decide for itself whether it wants to introduce differentiated QoS and how; this decision is linked with investment decisions which are in turned conditioned by different circumstances from one operator to another and from one location to another. Nevertheless, to the extent differentiated QoS offerings are introduced, the various offerings should be technically comparable and compatible, so that the content providers and the users can continue to benefit from the positive effect of the Internet on the internal market.

Question 3: Is the regulatory framework capable of dealing with the issues identified, including in relation to monitoring/assessment and subsequent enforcement?

As mentioned in the introduction, the applicable legal framework encompasses not only sector-specific regulation, but also competition law. In the current state of the law, the issues identified above can be adequately dealt with. The main concern is not so much the substance of the law, but rather the institutions which monitor compliance with the law and enforce it.

3.1. Market power issues

A number of issues relate to *abuses of market power*, when competitors are excluded as a result of vertical integration or exclusivity agreements between content providers and ISPs enjoying significant market power (or dominance). The impugned behaviour can consist in discrimination³² (not allowing competitors to benefit from the same QoS despite their willingness to pay) or blocking (either preventing affiliated content from being available via rival ISPs or preventing rival content from being available on the ISP in question).

3.1.1. Competition law

Competition law can apply in such cases. To the extent that the behaviour in question stems from a firm with significant market power and that it has an anti-competitive effect,³³ it will be prohibited under Article 102 TFEU (abuse of a dominant position). The use of discriminatory terms and conditions as between third parties is expressly listed as an example of abuse at Article 102(c) TFEU. Indeed, the ECJ has interpreted Article 102 TFEU to also prohibit discrimination, in a vertical context such as this, as against third parties in order to favour the dominant firm's own operations.³⁴ As for outright blocking, to the extent that there were pre-existing dealings (i.e. the content used to be available on the ISP in question), Article 102 TFEU will also apply to prevent an unjustified termination of such dealings.³⁵ If the behaviour takes place within the framework of an agreement between a content provider and an ISP and market power is present, Article 101 TFEU could also apply.³⁶ There is already some Commission decision practice concerning

³² The precise meaning of discrimination in the context of network neutrality is discussed *infra*, Question 8.

³³ See Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings [2009] OJ C 45/7.

³⁴ ECJ, Case C-333/94P, *Tetra Pak* [1996] ECR I-5951; Gen Ct, Case T-229/94, *Deutsche Bahn* [1997] ECR II-1689.

³⁵ See most recently on this, ECJ, C-468/06, *Sot. Lélos kai Sia* [2008] ECR I-7139. Given the current state of affairs (best-efforts and universal connectivity), it is most likely that the content used to be available on the ISP in question. However, in the absence of any previous dealings, the case-law on essential facilities would apply (see Gen Ct, Case T-201/04, *Microsoft* [2007] ECR II-3601), whereby a refusal to deal would violate Article 102 TFEU only under exceptional circumstances.

³⁶ See generally Regulation 330/2010 on the application of Article 101(3) TFEU to categories of vertical agreements and concerted practices [2010] OJ L 102/1 and the Guidelines on Vertical Restraints [2010] OJ C 130/1.

the award of exclusivity over ‘must-have’ content such as sports rights³⁷ (in addition to specific regulation on events of major importance to society³⁸). Finally, in the most extreme situation, vertical integration via a merger between an ISP and a content provider could be prohibited under the MCR,³⁹ provided that the parties are able and have an incentive to engage into input or customer foreclosure.⁴⁰

If the abuse is *exploitative* rather than exclusionary, for instance excessive prices for the available QoS level, Article 102 TFEU might also apply, albeit that the test for exploitative abuses is not clear, so that such abuses have not been investigated very often.

3.1.2. Sector-specific regulation – SMP regime

In addition, *sector-specific regulation* can be used to complement and bolster competition law. Electronic communications regulation contains a specific regime for operators that hold significant market power (SMP).⁴¹ That regime would allow to impose prohibitions on non-discrimination and on blocking upon ISPs holding SMP.⁴² However, as a pre-condition to the application of the SMP regime, a relevant market must have been defined and selected, either by the Commission in its Recommendation on relevant markets⁴³ or by a National Regulatory Authority (NRA) of its own motion.⁴⁴ As was mentioned before, in cases where discrimination or blocking could be a concern, the market power of ISPs would come from their position as the gateway to their end-users, when seen from the perspective of content providers. The market analysis would roughly follow that of call termination on fixed or mobile networks. However, no such ‘market for the termination of broadband data traffic (delivery of content) from the Internet backbone to the end-user’ has been identified, much less included in the Recommendation.⁴⁵ In the light of the rough competitive analysis made above under Question 1, that market might not meet the three-criteria test. More specifically, the second criteria (no prospect of effective competition) might not be met. In line with our competitive analysis, there is no need to add a market to the Recommendation now, but should significant problems arise, that option is available.

³⁷ See COMP/C.2/37.398, *Champions League* [2003] OJ L 291/25, COMP/C.2/37.214, *Bundesliga* [2005] OJ L 134/46 and COMP/38.173, *Premier League* [2008] OJ C 7/18.

³⁸ Pursuant to Art. 14 of Directive 2010/13 (Audiovisual Media Services Directive) [2010] OJ L 95/1, Member States may regulate the conditions under which events of major importance to society are broadcast. These provisions only apply to broadcasting, however, and not to other modes of content distribution.

³⁹ Regulation 139/2004 on the control of concentrations between undertakings (the EC Merger Regulation) [2004] OJ L 24/1.

⁴⁰ See generally the Guidelines on the assessment of non-horizontal mergers under the Merger Regulation [2008] OJ C 265/6.

⁴¹ Directive 2002/21, Art. 14-16.

⁴² These types of remedies are covered by Articles 10 (non-discrimination) and 12 (access) of Directive 2002/19 (Access Directive) [2002] OJ L 108/7, as amended.

⁴³ The current one being the Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation [2007] OJ L 344/65.

⁴⁴ NRAs must then seek the approval of the Commission for their market definition (Directive 2002/21, Art. 7(4)). They must show how the market meets the three-criteria test used by the Commission to select markets in its Recommendation: *ibid.*, para. 2.

⁴⁵ In 2003, the first Recommendation included a market for ‘broadcasting transmission services’ which covered the transmission of content over electronic communications services (but following a broadcasting model). That market was dropped from the list in the 2007 Recommendation, since according to the Commission it was generally competitive throughout the EU.

Similarly, as for *exploitative* abuses towards end-users, no relevant market has been selected for analysis under the provisions of the Universal Service Directive.⁴⁶ This reflects the widespread view that the provision of Internet access services by ISPs to end-users is either already competitive or made competitive through wholesale remedies such as local loop unbundling and bitstream access.

3.1.3. Sector-specific regulation – general provisions on transparency, minimum QoS and interconnection

Sector-specific regulation could nevertheless help to make market mechanisms work, as has already been recognized in the recent review of electronic communications regulation. The Questionnaire sets out how the Universal Service Directive (2002/22) has been amended to increase *transparency*. Increased transparency will help end-users steer the retail Internet access market better, by ensuring that they have the information to factor QoS issues in their choice of ISP. It can also help content providers in their dealings with ISPs (to the extent that they deal directly with them for end-to-end QoS, i.e. that Scenarios 1 or 2 above have materialized). Should transparency obligations fail, the Universal Service Directive now also empowers NRAs to set out *minimum QoS* requirements, as mentioned in the Questionnaire.

Beyond that, should blocking become too prevalent (contrary to what the rough competitive analysis made above would indicate), the Access Directive can also be used to uphold the principle now set out in the Framework Directive that end-users should be able to access and distribute information or run applications and services of their choice.⁴⁷ Indeed Article 5(1) of the Access Directive empowers NRAs to order operators controlling access to end-users to interconnect and make their services interoperable (irrespective of whether they hold SMP or not). Article 5 could play a large role in the unlikely event that the Internet would become ‘patchy’ because too many ISPs are each blocking their respective set of contents, applications or services.

3.2. Desirability of differentiated QoS in general

On the *fundamental issue of whether differentiated QoS should be allowed* at all, we have shown above why the case for such a radical intervention is not there, certainly not at this point in time. However, we have also identified a risk for the internal market, namely that the Internet would be broken down along national lines and that content providers would not be able to pursue an EU-wide QoS strategy given too much diversity in the QoS offerings from ISPs. Some form of standardization or harmonization would be an appropriate response should that risk materialize. The Framework Directive contains the requisite procedural framework for dealing with such issues.⁴⁸ The EU and Member State

⁴⁶ Directive 2002/22, Art. 17.

⁴⁷ Directive 2002/1, Art. 8(4)(g).

⁴⁸ Directive 2002/21, Art. 17.

institutions must be very careful to limit their role to nudging the industry on this, as opposed to prescribing specific technical solutions.

It can be noted that the internal market concerns set out above could be felt *mutatis mutandis* at international level.⁴⁹ In such a case, international standardization fora (including the ITU) or the WTO could be involved to solve coordination problems at the technical or regulatory level, respectively.

3.3. Institutional resources

All in all, it can be seen that, together with competition law, the current regulatory framework is already sufficient in substance to address the concerns outlined previously. As Question 3 alludes, the real issue is not so much substantive law as institutional resources.

The ‘network neutrality’ cluster of issues concerns the web of relationships between content providers, ISPs and end-users.⁵⁰ Considering that each of these three categories includes a large number of firms or individuals involved in continuous dealings, monitoring these dealings is a major undertaking. In the light of our analysis on substantive law, this task would fall primarily on the shoulders of the competition authorities, i.e. the national competition authorities (NCA’s), the Commission and the national courts.

All of these authorities have jurisdiction over the whole of the economy, and they rely primarily (NCA’s or Commission) or entirely (national courts) on complaints or lawsuits by competitors or customers. In all likelihood, they will be short of resources to address the market power issues identified above if contrary to expectations significant problems were to arise. Furthermore, these authorities are not concerned with the kind of internal market issues identified above (in addition to the market power issues).

3.4. Conclusion

At this point in time, the existing legislation – comprising competition law and electronic communications regulation – is sufficient to address any issues which might arise relating to network neutrality.

We recommend that institutional resources be specifically devoted to the monitoring of the issues identified above (potential abuses of market power by content providers or ISPs, fragmentation of the internal market). This would also ensure that public authorities possess the requisite level of information and knowledge to assess whether heavier intervention is needed and, as the case may be, to carry it out.

⁴⁹ Albeit that the impact of diverging industry and regulatory approaches to network neutrality issues is likely to be less severe as between trading blocks such as the EU and North America than as between the Member States of the EU.

⁵⁰ With the understanding that end-users can themselves be content providers, as with social networking services (the so-called ‘Web 2.0’).

Question 4: To what extent is traffic management necessary from an operator's point of view? How is it carried out in practice? What technologies are used to carry out such traffic management?

The authors of the report are not involved in the operations of electronic communications networks and services. They rely on evidence available to the public. As mentioned above, the available evidence is that operators experience traffic management problems, due to traffic imbalance, and that measures are taken to deal with such imbalances, ranging from imposing download limits on end-users to blocking traffic.

Question 5: To what extent will net neutrality concerns be allayed by the provision of transparent information to end users, which distinguishes between managed services on the one hand and services offering access to the public internet on a 'best efforts' basis, on the other?

Recent experimental work carried out by TILEC researchers Henze, Schuett and Sluijs⁵¹ shows that transparency obligations work, in the sense that customers make better purchasing decisions. Furthermore, ISPs are incentivized to provide high-quality services, thereby avoiding the 'dirt road' outcome. So the choices made in the last review of the electronic communications regulation were correct. Our colleagues provide further information on how to implement the transparency obligations. That is discussed below under Questions 12 and 14.

Question 5 assumes - quite correctly - that ISPs will be offering a range of services on their networks, some of which will not bear much resemblance to best-efforts internet access as we know it now. We are concerned with how this reality is translated legally in the regulatory framework.

Question 5 seems to rest on a sharp distinction between 'managed services' and a public Internet offered on a best-efforts basis. In its Open Internet NPRM of October 2009, the FCC put that distinction forward,⁵² and consulted on it further in September 2010.⁵³ We would caution against introducing such a sharp distinction in EU law. It is characteristic of US telecommunications law and of FCC practice always to seek to encapsulate products, services and equipment into sometimes arcane technology-based definitions, to which legal consequences are then attached. In general, we think that such an approach is too formalistic and overly static.

Furthermore, it disconnects regulation from market realities by creating the illusion that an array of definitions can somehow solve a problem. In the specific case of the Open Internet NPRM, the FCC is essentially requiring the industry to specify in advance, as much as possible, what services should be included under 'managed services'.⁵⁴ That amounts to an 'opt-in' on innovation: if the industry does not come forward now to notify its plans, future innovative services might not fit under the definition of 'managed services'. At first sight, this seems precisely the wrong approach to the regulation of innovative sectors.

In any event, EU electronic communications regulation is based on the principle of

⁵¹ B. Henze, F. Schuett and J. Sluijs, *Network Neutrality and Transparency. Theory, Experimental Research, Policy Conclusions* (2010), http://www.tilburguniversity.nl/tilec/publications/reports/network_neutrality_transparency.pdf

⁵² *Preserving the Open Internet; Broadband Industry Practices*, GN Docket No. 09-191, WC Docket No. 07-52, Notice of Proposed Rulemaking, 24 FCC Rcd 13064 (2009) (Open Internet NPRM).

⁵³ *Further Inquiry into Two under-Developed Issues in the Open Internet Proceeding*, GN Docket No. 09-191, WC Docket No. 07-52, Sept 1, 2010.

⁵⁴ *Supra*, note 52, at para. 150.

technological neutrality. When interpreted so as to give it the most meaning, this principle implies that (i) legislation and regulation should be formulated so as to be sustainable in the face of technological evolution and (ii) technological choices should not be pre-empted by legislation or regulation, unless this is absolutely necessary.⁵⁵ Introducing a notion of ‘managed services’ as opposed to ‘basic Internet access’ in EU law, defined in technological terms, would run counter to technological neutrality.

In conclusion, no attempt should be made to introduce a ‘managed services’ category in legislation or regulation.

⁵⁵ See I. van der Haar, *The principle of technological neutrality: connecting EC network and content regulation* (2008).

Question 6: Should the principles governing traffic management be the same for fixed and mobile networks?

As mentioned above, the authors are not involved in the operations of communications networks. They rely on generally-available information.

As a general starting point, there is no reason in principle not to follow the same analysis, as set above, for both fixed and mobile networks. Any difference between fixed and mobile networks would have to be justified by imperative technical reasons, for instance capacity constraints on mobile networks or routing difficulties arising from the mobility of the end-user. We are not in a position to conclude on whether such reasons exist.

While in principle the analysis should be the same, conceivably the outcome could be different. Indeed since many of the issues outlined above are related to the competitive situation on a given market and more specifically to the presence of market power, it is possible that it would vary as between fixed and mobile operator (or from one operator to the other, for that matter).

Question 7: What other forms of prioritisation are taking place? Do content and application providers also try to prioritise their services? If so, how – and how does this prioritization affect other players in the value chain?

Here as well, we are not in a position to answer the first two sub-questions beyond generally-available anecdotal evidence. We have described the available evidence as to prioritization in our reply to Question 2. As mentioned there, content and application providers are also taking measures which effectively prioritize their services, such as the use of content delivery networks and caching.

With respect to the third sub-question, we have indicated in the analysis made under Question 1, above, that content providers do not have much incentive to integrate vertically with ISPs, nor do ISPs have much incentive to accede to a request from a content provider to exclude competing content from its access network. Concerns would only arise in the presence of market power at the content provision level. However, such market power will not be based on the control of a physical bottleneck and as such it should not entail regulatory intervention. Competition law should suffice to police the behaviour of content providers.

Question 8: In the case of managed services, should the same quality of service conditions and parameters be available to all content/application/online service providers which are in the same situation? May exclusive agreements between network operators and content/application/online service providers create problems for achieving that objective?

Question 8 brings us directly to a central weakness in the network neutrality debate, namely the lack of a consistent definition of discrimination.

Some proponents of network neutrality would prohibit any discrimination *between data packets*, meaning that ISPs would effectively be prevented from examining packets in order to determine if one or the other deserves prioritization under any priority rule. Only random drop of packets in case of congestion would satisfy this very broad non-discrimination rule.

In its Open Internet NPRM, the FCC propose the following non-discrimination rule: “Subject to reasonable network management, a provider of broadband Internet access service must treat lawful content, applications, and services in a non-discriminatory manner.” The FCC adds that it “understand[s] the term “non-discriminatory” to mean that a broadband Internet access service provider may not charge a content, application, or service provider for enhanced or prioritized access to the subscribers of the broadband Internet access service provider... We propose that this rule would not prevent a broadband Internet access service provider from charging subscribers different prices for different services.” The FCC would therefore prevent discrimination *between content, applications and services*, which it construes to mean essentially a prohibition on charging content providers for QoS (end-users may however be charged, in contrast to non-discrimination between packets).

We consider that these two interpretations of discrimination are overinclusive. Instead, we propose to interpret discrimination according to the risks which have been identified above.

In our answers to the previous questions, we explained why there was a possibility (even if it is unlikely given adverse incentives) that content providers and ISPs would integrate vertically or enter into exclusivity agreements, where one or the other has significant market power, and then discriminate in favour of their own services and against rival content providers or rival ISPs, as the case may be. Here discrimination should logically be interpreted in the way it is normally understood in competition law and economic regulation, namely discrimination *as between firms in a similar position, so as to produce an anti-competitive effect (i.e. exclude a competitor to the detriment of consumer*

welfare).⁵⁶ The point of comparison is therefore not packets, not content, services or applications, but rather firms: two firms in the same position, i.e. requesting the same service (same capacity, same QoS level) must be treated without discrimination. Very importantly, this prohibition on discrimination applies only in the presence of dominance/significant market power, i.e. dominance (under Article 102 TFEU) or a substantial amount of market power (under Article 101 TFEU).

When understood in competition law terms, non-discrimination therefore means that the content provider or ISPs with significant market power must treat alike all third parties which are in the same position (including in the same position as its own operations which compete with those third parties). Accordingly, as long as all third-parties can have access to the same differentiated QoS offerings on the same terms and conditions, no discrimination arises within the meaning of competition law.

By implication, a content provider or an ISP which does not enjoy significant market power (or dominance) may discriminate, for instance by entering into exclusivity agreements or refusing to offer the same terms and conditions to all its trading partners.

In addition, we set out above why the introduction of differentiated QoS could present some risks for the internal market. Accordingly, any discrimination based on the Member State of nationality, residence or establishment of the content provider, the ISP or the end-user is bound to run afoul of the internal market provisions of the TFEU.

Considering that, as discussed above, there is no reason to intervene radically and prohibit differentiated QoS altogether, any principle of non-discrimination going beyond discrimination as understood under competition law and internal market law would overshoot the mark.

⁵⁶ See Articles 101(1)(d) and 102(c) TFEU.

Question 9: If the objective referred to in Question 8 is retained, are additional measures needed to achieve it? If so, should such measures have a voluntary nature (such as, for example, an industry code of conduct) or a regulatory one?

We explained above, in the reply to Question 2, why there might be a concern for the internal market when differentiated QoS offerings are introduced. This concern is double: (i) the number of ISPs with whom an ‘EU-wide’⁵⁷ content provider would have to deal, in order to obtain consistent QoS across the EU, would reach in the hundreds, each with their own differentiated QoS products and (ii) fragmentation along Member State lines would be re-introduced. It is possible that private arrangements might suffice to address these concerns, either through a pure private initiative (Scenario 2 as outlined under Question 2) or following nudging from the EU, in line with EU standardization policy.

Considering the high level of uncertainty prevailing as to the technological evolution towards differentiated QoS, any regulatory intervention should not in any event go beyond the typical role of public authorities in standardization policy.

⁵⁷ I.e. a content provider with a European or global brand image or wishing to pursue a European or global commercial strategy.

Question 10: Are the commercial arrangements that currently govern the provision of access to the Internet adequate, in order to ensure that the Internet remains open and that infrastructure investment is maintained? If not, how should they change?

As the Questionnaire already implies, interconnection arrangements for Internet traffic are moving away from the original peering model (exchange of traffic without any compensation). Increasingly one finds transit agreements where a fee is paid for the transmission of Internet traffic. A number of factors come into play when assessing whether two parties should peer or rather conclude an agreement whereby a fee is exchanged: the balance in traffic flows, the spillover effects (network effects in a two-sided platform⁵⁸) which may compensate for traffic imbalances, and the cost of monitoring traffic flows in order to determine compensation.

The onset of differentiated QoS offerings will only accelerate the commercialization of Internet interconnection agreements. As explained above in the reply to Question 2, the incentives of ISPs will be changed. Interconnection – with or without compensation – is usually an attractive proposition for ISPs, since it provides benefits to respective customer bases (network effects) without costing more than the incremental equipment and software costs and the extra traffic load. In contrast, prioritization has characteristics of a rival good: granting interconnection to the customers of a competing ISP diminishes the value of prioritization for my customers. In simple terms, if top-level QoS is to have some value, not everyone can enjoy top-level QoS.

As mentioned under Question 2, this implies that ISPs might have a weakened incentive to conclude arrangements concerning differentiated QoS with *all* their counterparts. If such arrangements materialize, they might be along the lines of Scenario 2, i.e. the formation of rival coalitions. Otherwise, Scenarios 1 or 3 would eventuate, neither of which is satisfactory in the EU context.

Considering the uncertainty as to how differentiated QoS will be introduced, we would advocate a cautious approach, whereby private arrangements are monitored to ensure that competition law or internal market problems are tackled if and when they would arise.

⁵⁸ Because the ISP operates a two-sided platform, it might be profitable to carry the traffic from another ISP for free (even if the traffic flows are imbalanced) if, in doing so, the ISP adds participants (content providers, end-users) on one side of the market such that the other side's willingness to pay increases.

Question 11: What instances could trigger intervention by national regulatory authorities in setting minimum quality of service requirements on an undertaking or undertakings providing public communications services?

We assume that transparency obligations are in place, as required by Directive 2002/22, and that they have been adequately designed (see Question 14). In principle, if the ISP market (broadband access) is competitive, customers should be able to choose the level of QoS they desire, for the price that they are willing to pay. The experimental results obtained by our TILEC colleagues (see Question 5) tend to show that, with a transparency obligation, no race to the bottom ensues and ISPs will tend to offer a good level of QoS.

Transparency obligations (such as those mandated by Art. 21 of Directive 2002/22) also enable NRAs and other interested parties to monitor the QoS offered by ISPs. In our view, *when an observed reduction in QoS is not accompanied by a reduction in the price of the service*, closer regulatory scrutiny is needed. In any other situation (increase in QoS, whether or not accompanied by a price increase, or decrease in QoS with a price decrease), the market is working.

In addition, intervention to set minimum QoS requirements could be warranted as a measure of last resort if ever the internal market issue set out above became acute and EU-level harmonization or standardization efforts failed.

Question 12: How should quality of service requirements be determined, and how could they be monitored?

This Question overlaps with Question 14, since consumers are meant to be informed about QoS and network management measures, according to Article 20 and 22 of Directive 2002/22.

The recent research of Henze, Schuett and Sluijs suggests that a two-pronged approach might be advisable when it comes to transparency. It is pointless to overload the average end-user with a mass of technical information about the services offered by the various ISPs. Instead, a smaller set of sophisticated users (specialized press and bloggers, trade and consumer associations, public authorities, industry professionals, etc.) could be provided with detailed information, in the hope that they would digest it and relay it to the rest of the end-users. At the same time, all users could be provided with more summary information.⁵⁹

We do not have the specialist technical knowledge to make a proposal concerning the more technical information to be made available to sophisticated users.

With respect to the summary information to be provided to all users, however, we would advise not to seek to summarize technical data, but rather to encourage the developments of benchmark tests, whose outcome would then be communicated in index form to users, in particular consumers.⁶⁰ By analogy, ISP offerings could be benchmarked for QoS in terms e.g. of how many hours of video can be downloaded using the monthly capacity limit (if any), how many minutes of video can be watched without interruption in the transmission, etc. It should be feasible for a trusted party to define a relevant benchmark that returns an index number, so as to ease the comparison between ISP offerings. For example, ISP A would offer broadband access with a QoS benchmark value of 100 at €30 per month, while ISP B would offer access with a QoS benchmark value of 200 at €50 per month.

Such an approach would give meaning to the transparency obligation and prevent it from turning into a formalistic exercise in which vast amounts of technical data are piled upon uncomprehending users.

⁵⁹ The experiment used these two prongs as alternatives, and found that positive welfare effects followed when either one was applied. In the specific context of Directive 2002/22, Article 20 already binds ISPs to provide information to all users, so that the practical significance of the experiment lies in how it shows that it would not be necessary to provide all available information to all users. A safe option would be to cumulate the two prongs.

⁶⁰ This approach is commonly used in the computer sector, where models are compared using a pre-defined benchmark (the time it takes for a series of operations using a word processor, a spreadsheet or a videogame, for instance).

Question 13: In the case where NRAs find it necessary to intervene to impose minimum quality of service requirements, what form should they take, and to what extent should there be co-operation between NRAs to arrive at a common approach?

As mentioned in the reply to Question 5, great caution should be exercised in introducing technological categories into regulation. We outlined above why the transparency obligations added in the recent electronic communications review should work. Should an NRA nevertheless conclude that it needs to intervene to impose QoS requirements, the safest course of action would probably be to choose a QoS level similar to the current best-efforts model as the minimal level of QoS, since this represents a well-established QoS level which is already available on the market.

By the same token, choosing a well-known QoS level as the minimal level would ease the coordination between NRAs. In the reply to Question 2, it was explained how the introduction of differentiated QoS could create a risk for the internal market. If NRAs do not coordinate and set diverging QoS standards from one Member State to the other, they could themselves contribute to distorting the internal market. While as a general principle, it can be good from a dynamic perspective if NRAs adopt contrasting regulatory approaches, so that the best approach can be revealed,⁶¹ in this specific case the starting point is a wide-ranging harmonization of QoS at this point in time through the use of the same protocols – and the same best-efforts model – across the EU.

⁶¹ See P. Larouche and M. de Visser, “*The triangular relationship between the Commission, NRAs and national courts revised*” (with M. de Visser) (2006) 64 *Communications & Stratégies* 124.

Question 14: What should transparency for consumers consist of? Should the standards currently applied be further improved?

See the answer to Question 12.

Question 15: Besides the traffic management issues discussed above, are there any other concerns affecting freedom of expression, media pluralism and cultural diversity on the internet? If so, what further measures would be needed to safeguard those values?

In line with our introductory remarks, the present contribution relies heavily on economic analysis. While we are convinced that regulatory and competition policy decisions must rest on a solid economic analysis, other perspectives should not be ignored. In the case of network neutrality, many contributions frame the debate in terms of rights and entitlements of citizens and users. We do not think that rights discourse can be used to short-circuit economic analysis: after all, it is quite possible that the rights and entitlements of citizens and users are already taken care of through the operation of market forces, in which case no public intervention is necessary.

At the same time, framing the discussion in terms of rights can also signal that the polity has a strong preference for a certain outcome, which should then be respected by economic analysis. In this respect, in the whole debate on network neutrality, one type of practice – blocking, as in Madison River and Comcast – has met with near-unanimous disapproval and has quickly enflamed the debate. Encouraged by the FCC’s 2005 statement of Internet principles, framed as consumer entitlements, the network neutrality debate was quickly infused with rights discourse. More than anything, the thought of no longer being able to access services, content and applications of one’s choice across the Internet mobilized support in favour of network neutrality rules. As mentioned previously, we should be careful not to overreact to misguided efforts to take short-term network management problems.

Blocking is also the one practice that has the most bearing on the concerns listed in Question 15. In principle, the introduction of differentiated QoS without any blocking does not prevent the flow of traffic across the Internet and therefore does not affect freedom of expression, pluralism or diversity. Of course, with differentiated QoS, it is possible that some content would be available only with a lower QoS level, but this does not mean it is unavailable at all.

By the same token, many users might be relatively indifferent to the QoS level they receive, for instance because they use applications which are relatively insensitive to QoS, such as e-mail or websites containing mostly written information. These users will however be affected by blocking.

Accordingly, it will come as no surprise that the new policy objective introduced at Article 8(4)(g) of the Framework Directive in 2009 is more specifically directed at blocking with its goal of ‘promoting the ability of end users to access and distribute information or run applications and services of their choice’.

In the light of the competitive analysis set out above, blocking would not seem to be a justifiable practice in normal circumstances. If it nevertheless occurs, it is likely to have an anti-competitive purpose and effect and be caught by competition law. In addition, as we outlined in our reply to Question 3, should blocking become too prevalent, the provisions of the Access Directive could be used to ensure that users have access to all content, services and applications.



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CENTRE ON REGULATION IN EUROPE

**Centre on Regulation in Europe (CERRE) asbl
rue de l'Industrie, 42 (box 16) – B-1040 Brussels
ph :+32 (0)2 230 83 60 – fax : +32 (0)2 230 83 60
VAT BE 0824 446 055 RPM – info@cerre.eu
www.cerre.eu**