



# Telsoc

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### Net Neutrality

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#### Abstract

The road to net neutrality within the European Union (EU) has been slow and winding. However, a

major milestone was reached in August 2016 through the publication of the BEREC Guidelines on the Implementation by National Regulators of European Net Neutrality Rules. This extended article explores the scope of the net neutrality principle as understood and applied in a number of jurisdictions. The approach in the EU is contrasted with the approaches of the Federal Communications Commission (FCC) in the United States (US) and of a number of other countries. Although there are some constants that recur for net neutrality in all of the countries examined, there remain a variety of specific local connotations. This paper argues that the BEREC Guidelines have effectively and significantly brought to an end the long lasting and highly polarised 'net neutrality' debate that began in the United States in the 1990s then subsequently spread with varying intensity to other parts of the world. The BEREC net neutrality guidelines potentially provide a comprehensive, flexible, readily implementable and globally exportable framework of solutions for balancing the legitimate 'net neutrality' needs ? social, economic and regulatory, of all stakeholders regardless of national jurisdiction. As with the earlier EU ex-ante regulatory frameworks for market analysis and cost-based interconnection, the BEREC paper paves the way for continued export of best practice regulation from the EU to the rest of the world. However, there are issues that demand caution in how the BEREC approach might be implemented.

## 1. Introduction

### What is net neutrality?

Net neutrality is a vague term, without a precise meaning. It holds different meanings for different stakeholders in academia, in consumer groups or in the value chain of providing Internet access services. The net neutrality discussion emerged in the United States (US) in the late 1990s because of concerns about potential harms to the end-to-end nature of the internet. The main concern was that the vertical integration of cable firms with internet service providers (ISPs) in the US could disrupt the end-to-end design[i] [7] principle of the internet.

In the emerging debate, network neutrality (or net neutrality it is now commonly abbreviated) was a term introduced by Tim Wu in a 2003 article[iii] [8] (Wu, 2003 [9]) as a requirement needed to safeguard evolutionary competition in the internet environment. What did Wu mean by network neutrality when he wrote his article? He said that net neutrality was probably best defined as a network design principle.[iii] [10] The concept implies that in such a network all content sites and platforms are treated equally. Therefore, an internet service provider (ISP) operating in such a network should be required to treat all data from all content providers in the same way. If a net neutrality requirement would not exist, ISPs (and/or vertically integrated providers as mentioned above) could ?throttle? certain content, slow down its delivery or, in an extreme case, even block it in order to give preferential treatment to its own traffic or to content originating from applications and/or content providers with whom the ISP could sign specific agreements.

There are many definitions of net neutrality in the existing literature; the concept has evolved over time. There are also differences of opinion regarding the usefulness of a net neutrality regulation. To illustrate, a few examples of alternative net neutrality definitions that emerged are given in the next paragraphs. In general, academic work on net neutrality has been primarily concerned with legal and economic suggestions about regulatory policies. Some of them are very vague. A group of leading scholars including prominent economists including William Baumol offers such an example:

*Network neutrality is a policy proposal that would, among other things, regulate how network providers manage and price the use of their networks (Baumol et al, 2007) [11]*

Gregory Sidak, a Visiting Professor of Law at Georgetown University Law Center, defined it as:

*a proposed regime of economic regulation for the Internet. (Sidak, 2007 [12])*

The difficulties in defining net neutrality were also acknowledged by other prominent economists:

*It is not easy to define net neutrality because not only is the concept not clearly and unanimously articulated, but it also spans over vague concepts of fairness and civil liberty much more than economics.* (Cave & Crocioni, 2007) <sup>[13]</sup>

In other words, the term has connotations that prevent it from being defined in purely economic terms.

Barbara Van Schewick, a strong advocate of net neutrality, refers to it as a set of rules:

*the term 'network neutrality rules' refers to non-discrimination rules that forbid operators of broadband networks to discriminate against third-party applications, content or portals ('independent applications?') and to exclude them from their network.* (Van Schewick, 2007 <sup>[14]</sup>)

Robert Hahn and Scott Wallsten, two affiliates with the Brookings Institution, provide a definition that focuses primarily on price discrimination issues:

*Net neutrality has no widely accepted precise definition, but usually means that broadband service providers charge consumers only once for Internet access, do not favour one content provider over another, and do not charge content providers for sending information over broadband lines to end users.* (Hahn & Wallstein, 2006 <sup>[15]</sup>. )

Save the Internet, an online organisation of individuals, businesses, and non-profit organisations established in 2006 for the advocacy of net neutrality, put forward a far more comprehensive definition which includes such issues as freedom of speech:

*Net Neutrality is the Internet's guiding principle: It preserves our right to communicate freely online. This is the definition of an open Internet. Net Neutrality means an Internet that enables and protects free speech. It means that Internet service providers should provide us with open networks ? and should not block or discriminate against any applications or content that ride over those networks.* <sup>[iv]</sup> <sup>[16]</sup>



A broader definitional approach has also been adopted by the European Union (EU)<sup>[v]</sup> <sup>[17]</sup> The first attempt to include net neutrality in the EU regulatory framework was in Article 8 of the Framework Directive<sup>[vi]</sup> <sup>[18]</sup> as amended in 2009, with the purpose of:

*promoting the ability of end-users to access and distribute information or run applications and services of their choice.* <sup>[vii]</sup> <sup>[19]</sup>

For the Body of European Regulators for Electronic Communications (BEREC), a European working group on regulation which assists the European Commission (EC) and the national regulatory authorities (NRAs) in implementing the EU regulatory framework for electronic communications<sup>[viii]</sup> <sup>[20]</sup>, net neutrality is about equal treatment of all internet traffic:

*To BEREC, 'net neutrality' describes the principle of equal treatment of network traffic. A violation of the net neutrality principle is considered unlikely if all traffic is treated on a best effort basis.* <sup>[ix]</sup> <sup>[21]</sup>

More recently, in Regulation 2015/2120, net neutrality is referred to in the EU regulatory framework as:

*Common rules to safeguard equal and non-discriminatory treatment of traffic in the provision of internet access services and related end-users rights.* (EU, 2015 <sup>[22]</sup>)

These definitional differences are not merely a matter of alternative perspectives. They also differ in the degree of focus put on the rights of end-users, on the quality experienced by consumers or the price of access to content and applications, depending on the political or economic goals of the definition's proponent. They also show different concerns in a dynamic environment. In the decade since Tim Wu coined the term, net neutrality has become highly and hotly debated.

## Why is net neutrality controversial?

As internet access and use became increasingly widespread and IP networks and high speeds were available, content and application providers were able to interact directly with the consumer through a web page. Acting at the edge of the network over which they are accessed or available, these service providers became independent of the provision of connectivity in the last mile and started supplying bandwidth-hungry products and services, such as video gaming or streaming, to end users. These services created a significant increase in traffic, constraining capacity of networks to properly handle such amounts of traffic without deterioration in service quality and worsening of the user experience. Thus the increase of traffic brought the issue of network congestion into the net neutrality debate

The increase of traffic translated into a need for further network investment. At the same time, however, increased competition from services such as voice-over-IP and messaging, contributed to significant losses of revenue to telecommunications service providers, and reduced their sources of funds to make the necessary network investments.

These facts have since been widely used across the world by telecommunications service providers to support the claim that identical regulation should be enforced on content and application service providers (?to create a level playing field?) and that a payment should be made by the latter (an interconnection, access or usage fee) to access telecommunications providers' networks. This created a new stream of economic literature regarding the most welfare-enhancing solutions to the pricing alternatives that might be considered.[x] [23]

Adding further complexity to the problem, a trend towards increasingly concentrated access markets and vertical integration of many network operators has directly fed the arguments put forward by defenders of strict net neutrality. Also, technology developments enabling more intrusive and detailed examination of the content of each individual packet, using techniques such as Deep Packet Inspection (DPI), have made possible the identification of sender, content and recipient of the packet, raising fears of discrimination against competitive content providers.[xi] [24]

Due to the worldwide adoption of the internet[xii] [25], other complex subjects such as freedom of speech, liberty, consumer's privacy or national security have been progressively included in net neutrality conversations, adding political perspectives to a more limited debate that was originally focused on economic modelling of pricing in two-sided markets.

The factors mentioned above have produced a dramatic change in the ICT sector, and during this period academics from different fields and other interested parties offered several new approaches to net neutrality. Although considerable discussion has ensued among legal practitioners and economics professors, no consensus appears to have emerged about a framework for analysing and potentially resolving issues surrounding net neutrality.

## How has net neutrality been implemented?

At its inception, in the 1960s, the internet was established in an academic environment with the objective of exchanging text messages among university researchers. Two fundamental design principles have guided the internet since then: data packets were routed through the network autonomously (the end-to-end principle) and as fast as the network resources available could allow (the best effort principle). These fundamental principles were key elements of the open internet spirit and remain important issues in the context of the net neutrality debate. For a while, prioritisation of packets was not critical because the original internet applications were not delay-sensitive, traffic congestion was not generally an issue, and routers were not capable of identifying packets associated with different applications, and prioritising them accordingly (as they now are).

The rapid increase in traffic in some parts of the internet, the increasing demand by consumers for time-sensitive applications such as VoIP or IPTV, and the improving technical ability to manage traffic, allowed the two fundamental design principles to be followed fairly readily over the years. Recently, a significant change has occurred in the value chain of internet services with the emergence of Content Delivery Networks (CDNs).[xiii] [26] CDNs are service providers to the Content and Application Providers (CAPs) that were designed to enhance the quality of delivery of internet content, through local caching and greatly increased amounts of direct routing.[xiv] [27]. CDNs invested significant amounts in transit networks in order to improve the flux of traffic in the internet and the quality of service experienced by end users.

These factors have contributed to the overall adherence to the two key net neutrality principles. There are not many reported violations of these principles. Nevertheless, in peak periods operators have always executed some traffic management practices to avoid congestion. If carried out without the purpose of causing harm to end users or competitors in the supply of internet access services, these traffic management practices have been accepted and not considered a violation of net neutrality principles.[xv]

[28]

## Why net neutrality has become more important

The importance of net neutrality derives from the profusion of services and applications provided over the internet. In the past, telecommunication services were closely coupled with the infrastructure over which they were accessed but, on the internet, content is separated from the network and is either free or paid for directly by the end user. From the user's perspective, it is content that provides value and infrastructure is purely a means of accessing content. As a result, the amount that users are prepared to pay for network access is based on their expectation of current and potential value provided through content and applications.

Around the turn of the century, telecommunications network companies (?telcos?) tried to resist these developments by constructing Next Generation Networks (NGNs), using internet protocols but offering higher and guaranteed service levels. One of the perceived advantages of the NGN was its ability to enable telecom operators to deliver a wide range of new, revenue-generating services from within a ?walled garden? created by gateways to other networks. But, in practice, the internet (via the World Wide Web) has delivered the vast majority of these new services which have substituted for the revenues anticipated by the telecoms operators. The internet has achieved this because, unlike NGNs, it locates intelligence at the network edge in the servers and clients of end users, and provides an open transport network to link them together, allowing users to innovate without permission and generate a far richer array of applications than the telecom operators ever could. The overall result is that the public internet has come to dominate telecommunications, and increasingly it is accessed through mobile devices.[xvi] [29] (Cisco 2015 [30]) Walled gardens have been shown, once again, not to be acceptable to users.

With service revenues inexorably shifting to internet-based application providers, telcos are under increasing financial pressure. Their revenues are at best flat and in many cases are falling. Simultaneously the hyper-demand for bandwidth is pushing up the costs of network infrastructure. Most telcos are investing heavily in order to keep up: developing and implementing technology that can deliver higher bandwidths over existing copper loops; rolling out replacement fibre infrastructure that offers virtually unlimited bandwidth wherever they can afford to do so; and finding ways to squeeze more bandwidth out of finite radiofrequency allocations for mobile services. But as fast as they invest the demand for data continues to rise faster.

Telcos are thus caught in a vicious circle. Starved of service revenues, they do not have the business case to invest sufficiently to meet the capacity requirements of all those services that users are demanding. Something has to give, and that means traffic management of some kind: throttling of demand, blocking of content or prioritisation of some users or applications ? perhaps on the basis of payment for higher quality of service. Each of these practices, however, is contrary to net neutrality principles.



## Is there a need to regulate net neutrality?

The FCC's 2015 *Order on Protecting and Promoting the Open Internet*<sup>[xvii]</sup> <sup>[31]</sup> (FCC 2015) regulated internet service providers in three ways:

- **No blocking:** broadband providers may not block access to legal content, applications, services, or non-harmful devices;
- **No throttling:** broadband providers may not impair or degrade lawful internet traffic on the basis of content, applications, services, or non-harmful devices;
- **No paid prioritisation:** broadband providers may not favour some lawful internet traffic over other lawful traffic in exchange for consideration of any kind – in other words, no "fast lanes". This rule also bans ISPs from prioritising content and services of their affiliates.

These tenets have become the mantra of net neutrality regulation generally. It should however be noted that the FCC established these principles not as ex-ante regulation, but as guides for ex-post intervention on a case-by-case basis as required. It is also pertinent that the rules themselves have to be applied carefully as exceptions are permitted for reasonable network management.

The economic basis for this regulation lies in the economic concepts of 'network effects' and 'two-sided markets'. Network effects concern the benefits created when an additional subscriber joins a network service. For example, in a telephone network each new subscriber creates additional calling opportunities for those people who were already part of the network. Similarly, the attractiveness of internet applications such as Twitter or Facebook is directly related to the number of existing users to which a potential new subscriber may connect. Two-sided markets are formed by networks or platforms bringing together two distinct groups, and thus creating value through network effects. For example, Google creates value by bringing together advertisers and end users, while broadband service providers (telcos) create value by linking their subscribers with the many content providers of the internet.

Network effects and two-sided markets provide the conditions for pricing decisions that would be irrational in conventional markets. The platform provider can obtain payment from either side of the market but is incentivised to minimise the price for end-users in order to maximise the network effects. This state of affairs has had two highly significant impacts: it has tended to consolidate market power in a very small number of platform providers and it has created a prevailing culture in which the internet is seen by the end-user as 'free'.

Taken together, these two impacts create enormous pressure on the telcos that provide broadband access linking the end users with the content providers of the internet. The on-going challenge is for the access network to provide sufficient bandwidth to support all the applications that the internet offers and users demand. They are severely constrained in the end-user price that they can set, so they may seek payment from the other side of the market. However, the market power of the content providers is now so great that the telco may be unable to extract further revenue. Thus starved of money on both sides of the market the telco may seek instead to block content or throttle demand or prioritise paid traffic simply to cover its costs.

Regulators, of course, have been used to stepping in to telecoms markets to rectify exactly these kinds of anti-competitive behaviour. For the past 20 years or so, regulatory authorities have identified telecommunications networks as bottleneck facilities, unable to be economically replicated. They have determined the suppliers of those networks to be dominant and thus justified ex-ante regulation to prevent anti-competitive practices and foster service-level competition. Why should they not step in again now to ensure network neutrality and prevent the pernicious practices identified in the FCC's Open Internet Order?

This paper argues that, while regulators should keep a watching brief over market developments, the imposition of ex-ante regulation of net neutrality is not normally required. The market can resolve almost all net neutrality issues. Broadband access providers and internet content providers are in a symbiotic relationship ? each feeds off the other, requiring the other to help it generate revenues and profits. In economic terms, the presence of increasingly powerful internet content providers is providing the necessary countervailing buyer power to curb the dominance of incumbent access providers in national markets, while the demands of a two-sided market mean that the content providers cannot afford to exploit their economic power to the detriment of the organisations that connect them with the very end-users that are the source of that power. The future role of the regulator is going to be much more one of monitoring agreements rather than intervening to set prices or determine quality of service levels. Net neutrality rules are therefore primarily guidelines for ex-post resolution of disputes ? which is exactly what the FCC's Open Internet Order suggested.

## Structure of this Paper

This section has provided an introduction on the nature of net neutrality and the various ways in which it has been defined.

**Section 2 (*The new EU Regulatory Framework*)** deals with the new European Union regulatory framework on net neutrality, including the BEREC guidelines for implementing that framework that were published in August 2016 and subjected to very extensive public consultation.

**Section 3 (*What is happening outside of Europe*)** compares the EU approach with approaches to net neutrality in a range of other countries. The approach of the American Federal Communications Commission (FCC) is touched on in the introduction to the paper and is further elaborated in Section 3. The other countries in the set have been chosen to provide an indication of the common features and diversity of approaches in the Americas, Australia and Asia.

**Section 4 (*Overall Assessment*)** offers an overall assessment of where the public discussion on net neutrality is at present and offers some views on the current and potential importance of the EU framework.

## 2. The new EU Regulatory framework

### The history of net neutrality in the EU

Net neutrality has never made the same kind of waves in Europe that it has in the US. There are many reasons for this, principal among them being the lack of widespread competition from cable operators<sup>[xviii]</sup><sup>[32]</sup> and the fact that the EU comprises 28 separate nations rather than a single nation with an over-arching Federal Communications Commission. As a result of its consensual approach to telecoms regulation, the EU rules on network neutrality that were published in November 2015 have had a long and sometimes troubled gestation period.

The EU regulatory framework for electronic communications services (ECS) was published by the European Commission (EC) in 2002<sup>[xix]</sup><sup>[33]</sup> and became law in Member States in 2003. It is important to note that this framework said very little about internet services, and exempted the internet from the majority of its regulatory measures in the way that the 1996 Telecommunications Act did in the US. Consequently, there has been no European equivalent to the legal debate in the US as to the definition of an internet service, precisely because such a definition makes no difference as to the regulatory treatment of the service in question. Instead, the focus of the EU regulatory framework in 2003 (which has been maintained through subsequent amendments in 2009<sup>[xx]</sup><sup>[34]</sup>) was on the determination of relevant ECS markets and the imposition of remedies for suppliers in a position of significant market power (SMP) within those markets.

The EC published a list of relevant markets (i.e. markets susceptible to ex-ante regulation on account of SMP) in 2002. The initial list had 18 markets but this was subsequently reduced to 7 markets in 2007, and then further reduced to 5 markets in 2014.<sup>[xxi]</sup><sup>[35]</sup> These reductions had something to do with creating a manageable workload for the national regulatory authorities (NRAs) in member states that had to conduct the market analyses, but it is notable nevertheless that the focus of each list is on wholesale rather than retail markets, exclusively so in the latest version. In effect, the EU regulatory framework has been successful in the terms that the EU set out in 2002: the imposition of effective wholesale regulatory obligations has enabled the development of effective retail competition in downstream markets and hence the removal over time of all ex-ante regulation of retail competition.

The prevalence of strong competition in retail electronic communications services markets has had a major influence on the development of network neutrality in the EU. Under such conditions net neutrality occurs naturally: any attempt to differentiate service in terms of price or quality that is unacceptable to end-users will tend to be met by a stampede to rival retail offers, and thus will prove unprofitable. Furthermore, an amendment to the Universal Service Directive in 2009 imposes transparency on network operators' traffic management practices, and allows users to change suppliers without penalty if they are dissatisfied with any changes. As a result, there have been very few incidents of unwarranted breaches of net neutrality reported in Europe. In fact, BEREC noted only two relatively minor such incidents in its 2013 annual report and it concluded that:

*there is wide agreement among national regulators that the existing regulatory tools enable NRAs to address competition concerns related to net neutrality for the time being. (BEREC 2013<sup>[36]</sup>)*

So why was a net neutrality regulation necessary? If BEREC concluded that net neutrality incidents were few and the existing rules were sufficient, why did the EC nevertheless include net neutrality proposals in the Telecoms Single Market legislation (EU 2013) that was put to the European Parliament in September 2013?

The answer is harmonisation. At the heart of the Single Market ideal lies the expectation that the same rules should apply in each member state. Rules may be imposed by a Directive (that has to be legislated as law in each member state), or by an EC Regulation (that has direct legal authority of which member states must take the utmost account?). However, where the regulatory framework is silent (as in the case of network neutrality), member states are free to impose their own rules, which creates the potential for divergence between member states and threatens the continuation of a single European market. This was in fact already happening via decisions taken by NRAs in the Netherlands (see Figure 1) and Slovenia. So, in order to prevent further proliferation across the member states the EC proposed the development of a new Regulation specifically to safeguard non-discriminatory treatment of Internet traffic.

#### Figure 1: Dutch Network Neutrality Rules

In 2011, the Netherlands became the first country in Europe to enshrine network neutrality in national law. The measure was designed to prevent operators blocking/throttling content or charging over-the-top (OTT) players such as WhatsApp for providing messaging services, and also to ban the use of deep packet inspection (DPI) to monitor usage of some applications. The new law banned charging consumers extra for using internet-based communications services (but it applies only to the open Internet and not to managed services). The law was further revised and strengthened in May 2016, with the final version only approved by the Senate in October 2016.



National net neutrality rules that contradict the EU Regulation may be retained until 31 December 2016. This means that the Dutch Law will need to be amended again if it is found to be inconsistent with the EU Regulation. Responding to the Senate's approval in October 2016, the GSMA says the tighter laws in the Netherlands will stifle development and limit consumer choice and "goes far beyond the intent of the EU Regulation." However, others e.g. Van Eijk (2014<sup>[37]</sup>) have suggested that the EU Regulations have been established on the same basis as the Dutch Law, and are consistent with it. In truth, both the Dutch Law and the EU Regulation leave room for interpretation. (e.g. when does an "internet service" become a "managed service" or a "specialised service" where paid prioritisation is allowed?) It seems more likely that future harmonisation will be in the interpretation of the existing rules rather than changing the Law.

One such example is already taking place. T-Mobile Netherlands offers a music streaming service outside of the user's data cap, and the Dutch competition authority has launched an investigation to determine whether this type of zero-rating contravenes the net neutrality rules.

## The EU Regulation of November 2015

Regulation 2015/2120 of 25 November 2015 has the purpose of "laying down measures concerning open internet access" and amends previous Directives and Regulations necessary for this purpose. *Prima facie* this Regulation has the same purpose as the FCC's Order "in the matter of protecting and promoting the open internet" that was published earlier in 2015.<sup>[xxii]</sup><sup>[38]</sup> However, as the previous section makes clear, the genesis of the EU Regulation was quite different from that of the FCC Open Internet Order. Consequently, even though the two regulatory frameworks have much in common, it is instructive to examine the discrepancies between the two documents so as to highlight the different political and economic perspectives that exist on either side of the Atlantic.

### Traffic management as part of reasonable network management

The EU Regulation builds upon and adds to the provisions within the FCC's Order in relation to reasonable network management. To see this, it is necessary to quote Article 3(3) of the EU Regulation in its entirety, and after each paragraph to highlight the ways in which it differs from the FCC's position:

*Providers of internet access services shall treat all traffic equally, when providing internet access services, without discrimination, restriction or interference, and irrespective of the sender and receiver, the content accessed or distributed, the applications or services used or provided, or the terminal equipment used.*

This is effectively a definition of network neutrality, and in particular affirmation of the FCC prohibition on blocking and throttling of internet traffic. However:

*The first subparagraph shall not prevent providers of internet access services from implementing reasonable traffic management measures. In order to be deemed to be reasonable, such measures shall be transparent, non-discriminatory and proportionate, and shall not be based on commercial considerations but on objectively different technical quality of service requirements of specific categories of traffic. Such measures shall not monitor the specific content and shall not be maintained for longer than necessary.*

As with the FCC Order, the prohibition on blocking and throttling is limited by the acceptance of reasonable traffic management. In the FCC Order this is defined as network management "primarily used for, and tailored to, ensuring network security and integrity, including by addressing traffic that is harmful to the network". Likewise, the EU Regulation emphasises the technical rather than commercial nature of reasonable traffic management, but it goes much further in its acceptance of what might be allowable. Essentially, broadly based solutions are acceptable: they must not discriminate against specific users or specific content, and they must be both proportionate and time-limited; nevertheless, the EU regulation appears to condone or even encourage quality-of-service differentiation for different categories of service.

*Providers of internet access services shall not engage in traffic management measures going beyond those set out in the second subparagraph, and in particular shall not block, slow down, alter, restrict, interfere with, degrade or discriminate between specific content, applications or services, or specific categories thereof, except as necessary, and only for as long as necessary, in order to:*

- 1. comply with Union legislative acts, or national legislation that complies with Union law, to which the provider of internet access services is subject, or with measures that comply with Union law giving effect to such Union legislative acts or national legislation, including with orders by courts or public authorities vested with relevant powers;*
- 2. preserve the integrity and security of the network, of services provided via that network, and of the terminal equipment of end-users;*
- 3. prevent impending network congestion and mitigate the effects of exceptional or temporary network congestion, provided that equivalent categories of traffic are treated equally.*

This third paragraph more or less restates and re-affirms the second paragraph, but in the sub-bullets provides the justification for the exemptions. First and foremost is the need for harmonisation (to 'comply with Union legislative acts?'); secondly there is the same condition of network integrity and security that is the sole concern of the FCC; finally there is licence to mitigate network congestion so long as the mitigation measures are not targeted at specific content providers or end users.

## Service differentiation ? quality and price

If the broadly-based exemptions from 'pure' network neutrality on the grounds of network management are the thin end of the wedge, at the thicker end is permissibility of service differentiation explicitly on the grounds of quality of service and (implicitly) price. Whereas the FCC Order expressly prohibits 'paid prioritisation' and offers no exemption on the grounds of reasonable network management, the EU specifically allows for service differentiation in Article 3.5:

*Providers of electronic communications to the public, including providers of internet access services, and providers of content, applications and services shall be free to offer services other than internet access services which are optimised for specific content, applications or services, or a combination thereof, where the optimisation is necessary in order to meet requirements of the content, applications or services for a specific level of quality.*

*Providers of electronic communications to the public, including providers of internet access services, may offer or facilitate such services only if the network capacity is sufficient to provide them in addition to any internet access services provided. Such services shall not be usable or offered as a replacement for internet access services, and shall not be to the detriment of the availability or general quality of internet access services for end-users.*

The clear contra-distinction between 'internet access services' and 'other services' implies paid prioritisation even though the Regulation does not explicitly refer to the commercial terms on which other services are provided and limits the scope of such services to circumstances in which they do not substitute for internet access services. The EU Regulation therefore attempts to keep alive the possibility of the NGN, a project that has absorbed many Euros of investment by European telcos since the millennium.

## The BEREC Guidelines of August 2016

The EU Regulation is motivated by and aims for harmonisation of net neutrality rules across the continent. However, the Regulation itself did not provide sufficient detail to achieve this, and in Article 5(3) it required BEREC to issue implementation guidelines 'in order to contribute to the consistent application of this Regulation'.

The public consultation exercise initiated by BEREC generated a staggering 481,547 separate responses. These were broadly split into two camps:

- **Civil society**, including individuals, campaigns supported by individuals and organisations representing citizens or consumers. The civil society respondents (along with the CAPs, which broadly promoted the same agenda as civil society representatives) called for a strict interpretation of network neutrality that is fully application-agnostic, has limited and carefully ring-fenced exemptions for network management purposes, and contains prohibitions on price differentiation and zero rating.
- **Industry**, including ISPs, other industry stakeholders and their representative organisations. The ISPs and their group representatives were adamant that there is a need for flexibility in terms of traffic management, quality of service and price, allowing different rules to apply to different categories of traffic. The claims of the ISP community reached a crescendo in the 5G Manifesto (Paterson et al 2016<sup>[39]</sup>) signed by the chief executives of 17 leading network companies, which claimed that 'BEREC's draft proposal of implementation rules is excessively prescriptive and could make telcos risk-averse thus hampering the exploitation of 5G, ignoring the fundamental agility and elastic nature of 5G Network Slicing to adapt in real time to changes in end-user / application and traffic demand'. (Paterson et al 2016<sup>[39]</sup>)

Faced with these two diametrically opposed groupings, BEREC chose a middle ground position, which is carefully nuanced. The guidelines are sufficiently clear and firm that they have been seen as a win by advocates of the open internet, helped in part by the use of the term 'Net Neutrality' in the title (whereas the EC Regulation and FCC Order avoided this term). Nevertheless, in our view the Guidelines provide for effective and proportionate service differentiation where it is required in order to encourage investment and promote new applications without in any way debilitating internet access services.

## Traffic management

BEREC notes that Article 3(3) of the regulation has the principle aim of prohibiting traffic management practices that are unreasonable. The starting point for regulation must therefore always be the seven principles within Article 3, namely:

- No blocking
- No slowing down (throttling)
- No alteration
- No restriction
- No interference
- No degradation
- No discrimination.

The three exemptions listed in the Article should not be applied without firm supporting evidence. Exemptions on legal grounds have demonstrably to be compliant with the EU Charter of Fundamental Rights. Continuous monitoring of network integrity and security is acceptable, always subject to the overarching principle of proportionality, but measures that involve active blocking of specific IP addresses or specific content can only be justified in response to concrete security threats and only for as long as is necessary to deal with those threats. Similarly, a traffic management exemption should only be granted for exceptional and temporary congestion, and can only be applied as long as it is necessary.

In this area the Guidelines add considerable strength to the Regulation. BEREC recognises that network management could be used by ISPs as a convenient smokescreen for otherwise prohibited blocking and throttling of internet access. If this exemption is invoked frequently or for a prolonged period then it should be disallowed and the ISP forced properly to dimension its network. If congestion management is required, it should normally be done on an application-agnostic basis, and throttling as opposed to blocking of traffic should be preferred; only in truly exceptional circumstances should application-specific blocking of traffic be acceptable.

## Service differentiation ? quality and price

The Guidelines confirm that ISPs and end-users have freedom to conclude agreements with different commercial and technical terms as well as differences in service characteristics such as price, data volumes and speed. However, this freedom is bounded by the absolute requirement that they shall not limit the exercise of end-user rights as laid down in Article 3(1) of the regulation. BEREC considers that end-user rights are likely to be unaffected by application-agnostic offers (i.e. offers that apply equally to all applications) so such offers are likely to be acceptable. Similarly, time-limited offers (e.g. free music streaming to new mobile subscribers) that are not subject to preferential traffic management are allowable.

However, commercial conditions or practices involving price differentiation applied to categories of applications are more likely to restrict user rights. In these cases, BEREC considers that a comprehensive assessment by the NRA may be required, and it provides some suggested indicators to be taken into account. These include:

- The extent to which the ISP or CAP has market power;
- Whether material harm to competition is likely to be caused;
- Whether the end user's choice of applications is restricted;
- Whether the end user is incentivised to use particular applications;
- The scale of the practice ? are many end users impacted?
- The extent to which alternative offers or alternative providers exist.

In conclusion, based on the application of these criteria, BEREC comes down firmly on the side of prohibiting three particular practices:

- Higher prices for data associated with a specific application or class of application. Higher prices provide a disincentive to usage of the applications affected, and hence restrict end-user choice. They also may discourage the development of new applications.
- Zero-rating for data associated with a specific application or class of application. Zero-rating provides an incentive to usage of the applications affected and not others, and hence restricts end-user choice. Furthermore, the lower the data cap, the stronger such influence is likely to be.
- Price differentiation between individual applications within a category. Such price differentiation will impact competition between providers within that class, and thus undermine the goals of the Regulation.

These Guidelines clearly provide strict limitations on the provision of specialised services with different price/quality characteristics from standard internet access services. Nevertheless, the Guidelines leave room for service differentiation within the European Internet, so long as: the differentiation applies to sufficiently broad categories of application; does not significantly restrict or influence user choice; and does not have anti-competitive effect or intent.

There is also room for specialised services under Article 3(5) of the Regulation. BEREC clarifies that these services need to be different from internet access, optimised for specific content or applications, and that a level of quality that cannot be assured over internet access is objectively necessary. Examples of the kind of specialised services that BEREC believes may be justified include VoLTE, linear broadcasting IPTV, and VPNs, as well as sector-specific applications such as remote surgery. Nothing is set in stone, however, as over time both the service requirements and the capabilities of the internet will change; regulators will need to keep a watching brief on such developments and adapt regulations accordingly. In response to the concerns expressed by ISPs, BEREC also makes clear that 5G network slicing<sup>[xxiii]</sup> <sup>[40]</sup> may be used to deliver specialised services consistent with the rules.

The Guidelines thus make clear that fast lanes, toll roads or autobahns are permissible in the European internet. However, ?it is of the utmost importance that the provisions regarding specialised services do not serve as a potential circumvention of the Regulation?. This means that specialised services need to be separated from standard internet access and their differentiation needs to be objectively justified. Furthermore, they can be offered if and only if there is sufficient network capacity to ensure that internet access services are not degraded by the provision of specialised services.

Ensuring that standard internet services are not degraded by specialised services is the hardest challenge that NRAs will face. The Guidelines suggest that different approaches are required for fixed access, mobile access and core networks.

- For fixed access, which offers dedicated capacity to an individual end user, the user should be able to choose how to use it, including giving priority to paid services over internet access.
- For mobile access, it is impossible to forecast accurately the number of users and traffic volumes within a given cell at a given time, so small-scale and short-term fluctuations of service quality are to be expected, and should not be seen as constituting a breach of net neutrality rules.
- For core networks, which are shared by multiple users and do not suffer the same unforeseeable fluctuations in traffic, NRAs should measure performance and intervene if metrics such as latency, jitter, packet loss and speed are degraded to a statistically significant extent after the introduction of specialised services.

## What happens next?

The proof of the pudding is in the eating. The worth of the EU Regulation and the BEREC Guidelines will only be discovered in their implementation. This involves NRAs following the detailed guidance that they have been given to monitor traffic management practices, measure performance levels and assess market impacts. Ultimately what matters most is effective enforcement using the powers that NRAs have to:<sup>[xxiv]</sup>

[41]

- require an ISP to take measures to eliminate or remove the factor that is causing the degradation;
- set requirements for technical characteristics to address infringements of the Regulation, for example, to mandate the removal or revision of certain traffic management practices;
- impose minimum QoS requirements;
- impose other appropriate and necessary measures, for example, regarding the ISPs' obligation to ensure sufficient network capacity for the provision of high- quality non-discriminatory internet access services;
- issue cease-and-desist orders in case of infringements, possibly combined with periodical (daily/weekly) penalties, in accordance with national law;
- impose cease orders for specific specialised services unless sufficient capacity is made available for internet access services within a reasonable and effective timeframe set by the NRA, possibly combined with periodical (daily/weekly) penalties, in accordance with national law;
- impose fines for infringements, in accordance with national law.

BEREC itself will be monitoring developments as part of its annual work programme and publishing an annual report on the implementation of the Guidelines. This annual naming and shaming process worked well in the implementation of the 2003 regulatory framework, and the fact that it is to be adopted again now highlights the importance attached by the EC to harmonised net neutrality rules for Europe.

The question then arises: to what extent can the Regulation and BEREC Guidelines provide a template for elsewhere?

### 3. What is happening outside of Europe

#### Introduction

A Web Index survey of the legislative and regulatory provisions on net neutrality implemented up to 2014 shows a wait-and-see attitude in most places, including important jurisdictions where the survey concludes there is traffic discrimination.<sup>[xxv]</sup> [42] A more detailed analysis of each country shows a wide range of criteria for regulatory intervention and radically different attitudes towards zero-rating.<sup>[xxvi]</sup> [43] The range of approaches regarding net neutrality runs from the extreme case of the national legislature imposing strict non-discrimination requirements to doing nothing at all. Between these two poles, some countries have issued guidelines that mainly focus on network management practices by internet access providers: if monitoring detects harmful behaviour this triggers government intervention.

Those nations that have taken some initiatives on net neutrality can be roughly divided in the following categories:<sup>[xxvii]</sup> [44]

- Countries that have introduced legislation to ensure net neutrality and have prohibited blocking, slowing down and unreasonable discrimination of services, some of them including zero-rating, e.g. US, Brazil, Chile (and the Netherlands in the EU).
- Countries that have followed a light-touch style whereby provisions on net neutrality were initially established jointly with the industry, such as the Canadian<sup>[xxviii]</sup> [45] guidelines issued in 2009, or the Korean 'Guidelines for Network Neutrality and Internet Traffic Management', published in December 2011. Similar approaches have been adopted in Europe including the Norwegian model of co-regulation and the UK's similar approach that preceded legislation coming out of the European Commission.
- Countries that have taken no specific measures, as the national authorities consider that ex-post institutions and laws can address the issues (e.g. Australia and New Zealand).
- Countries that have initiated public consultations on net neutrality and are still debating what best to do (e.g. India).

In this chapter a series of comparative country case studies are presented to illustrate this range of practices.

#### USA

After a number of twists and setbacks, on 26 February 2015 the FCC voted to adopt net neutrality rules. (FCC 2014 <sup>[46]</sup>) The text of the rules, which apply to all providers of broadband internet access services (BIAS) including mobile operators, sets three key provisions ('the Bright-Line Rules'): no blocking,<sup>[xxix]</sup> [47] no throttling,<sup>[xxx]</sup> [48] no paid prioritisation.<sup>[xxxi]</sup> [49]

The new rules are based on a 'theory' of market evolution, the proposition that the internet's openness continues to enable what the FCC calls a 'virtuous cycle':



*The Internet's openness is critical to these outcomes, because it enables a virtuous circle of innovation in which new uses of the network - including new content, applications, services, and devices - lead to increased end user demand for broadband, which drives network improvements, which in turn lead to further innovative network uses. (FCC 2010 <sup>[50]</sup>)*

The FCC concludes that BIAS have a clear incentive to discriminate (paragraph 78<sup>[xxxii]</sup> <sup>[51]</sup>) and that they have done so in the past (paragraph 79<sup>[xxxiii]</sup> <sup>[52]</sup>) irrespective of whether they have market power over competitive service providers (paragraph 84).

Therefore, according to the FCC, rules requiring an open internet need to be set in place in order to guarantee the sustainability of the 'virtuous cycle'. Two significant exceptions are made in the FCC rules.

- broadband internet service providers are allowed to set usage-based pricing (e.g. the use of data caps) and practice 'zero-rating'?
- the rules do not apply to payment agreements between BIAS and content and application providers, neither between infrastructure owners in the internet value chain: BIAS, content delivery networks (CDNs) or backbone networks.

Interestingly, the FCC's rules refer to the possibility (citing examples of market abuses) that discriminatory behaviour may start to emerge at the points of interconnection between 'last mile' internet access providers and the backbone owners of the internet (Internet Traffic Exchange, paragraphs 194-206). In effect this recognises the changing nature of the internet market structure and the need to monitor the emergence of new actors with significant market power.

The logic behind the FCC approach resides in a case-by-case analysis of complaints made to the Commission about unlawful practices. With this in mind the FCC recognises the complexity and trade-offs put forward by both net neutrality objectors and supporters. A case-by-case approach to evaluating specific instances of usage-based pricing and zero-rating is a cautious position. There is recognition of the need for better understanding so as not to kill off potentially welfare-enhancing pricing options in a highly dynamic and rapidly evolving internet digital ecosystem.

Much has been written on the history of net neutrality policy in the US, and many commentators suggest that the US rules are much more stringent than those in Europe. However, in our view the similarities outweigh the differences, with both ultimately preferring ex-post remedies based on clearly-defined regulatory guidelines, so as to address the complexities inherent in the market. Others have also highlighted the parallels between the European and the American net neutrality legal contexts. (Marcus 2014 <sup>[53]</sup>)

## Canada

The Canadian Radio-television and Telecommunications Commission (CRTC) released a net neutrality framework in 2009 (CRTC 2009 <sup>[54]</sup>:657). The policy provides for intervention by the CRTC if internet traffic management practices (ITMP) are of a discriminatory nature, on a case-by-case basis, and in response to a complaint. When a complaint is received, the CRTC will start an investigation and the internet service provider will need to describe the traffic management practices being employed, as well as the need for them, their purpose and effect. The description must also identify whether or not the ITMP results in discrimination or preference. In case the traffic management practice is considered discriminatory, the ISP will need to:

- demonstrate that the ITMP is designed to address the need and achieve the purpose and effect in question, and nothing else;
- establish that the ITMP results in discrimination or preference as little as reasonably possible;
- demonstrate that any harm to a secondary ISP, end-user, or any other person is as little as reasonably possible; and

- explain why, in the case of a technical ITMP, network investment or economic approaches alone would not reasonably address the need and effectively achieve the same purpose as the ITMP.

These guidelines help the telecommunications sector in defining what are considered acceptable traffic management practices. On the other hand ?economic ITMPs?[xxxiv] <sup>[55]</sup> are allowed:

*In contrast, economic ITMPs would generally not be considered unjustly discriminatory, as they link rates for Internet service to end-user consumption. Economic ITMPs also provide greater transparency to users than technical ITMPs, as they are reflected in monthly bills. Furthermore, these practices match consumer usage with willingness to pay, thus putting users in control and allowing market forces to work.*

The Canadian policy emphasises transparency in the management of traffic on ISP networks and avoids ex-ante intervention in safeguarding net neutrality principles. However, in late 2013, Ben Klass, a Bell Mobility customer, submitted a complaint regarding Bell?s Mobile TV application which allowed him, for \$5 per month, to consume an extra 10 hours of video content per month, some of which was Bell-owned. Vid?otron, another Canadian telecommunications company operating mainly in the Quebec province, had a similar application that charged \$10 per month for 15 hours of content. Because these applications track usage in terms of hours whereas other content not owned by Bell or Videotron was measured in megabytes or gigabytes, Klass argued that these companies were giving preferential treatment to their own data and charging much higher prices. In its decision, the CRTC (2015 <sup>[56]</sup>) ordered Bell Mobility and Vid?otron to halt this practice. Bell Mobility was mandated to eliminate this unlawful practice. Vid?otron had to assure CRTC by 31 March 2015 that its application had been withdrawn and that any new mobile TV service it offered did not give it an unfair preference or advantage over similar services.[xxxv] <sup>[57]</sup>

## Chile

Chile was the first nation to enact net neutrality principles into law in July 2010[xxxvi] <sup>[58]</sup> It did so partly in response to substantial pressure from citizens? groups, most notably NeutralidadSI[xxxvii] <sup>[59]</sup> that petitioned representatives from Congress about the importance of having such a law in place to guarantee the rights of users. They also produced evidence that major ISPs were acting contrary to the principle of net neutrality, such as by blocking ports that allow the exchange of P2P files.[xxxviii] <sup>[60]</sup>

A paper by the Secretary of Telecommunications of the Government of Chile, Pedro Mariano Huichalaf Roa, describes in detail the net neutrality policies followed in Chile.[xxxix] <sup>[61]</sup> The main legal principles are that:

- ISPs (those who provide access to the Internet) may not arbitrarily interfere with, discriminate against, or throttle in any form the right of any Internet user to use, send, receive or offer any legal content, application or service on the Internet, except when to act to safeguard the privacy of end users, the protection against virus and the security of the network;
- ISPs must provide parental control services;
- ISPs must provide in writing all the data necessary to correctly identify the service purchased by the end user;
- ISPs must guarantee the privacy of end users, protection against malware, and network security.

Despite these apparently strict rules, mobile operators kept offering zero-rated services for selected content such as Facebook and Twitter. This led to further disputes with civic organisations, and complaints that the regulatory authority, Subtel, was failing in its duty by not taking any action regarding the traffic management practices and zero-rating by ISPs. According to ONG Civico,[xli] [62] a Non-Governmental Organisation that promotes the development of public technological policies in favour of the citizenship, representing it in the discussions before the authority and the industry, for four years after the approval of the net neutrality law in Chile, Subtel did not monitor the quality of bandwidth provided by ISPs to end-users. In June 2013, Civico brought forward evidence that Subtel was aware of unlawful traffic management practices by ISPs,[xlii] [63] and Alberto Cerda (a director with Derechos Digitales[xliii] [64]) in his evaluation of net neutrality regulation in Chile (Cerda, 2013 [65]) also alleges negligent supervision of the law by Subtel.

Subtel refuted these allegations (La Segunda, 2013 [66]) and in June 2014 it prohibited zero-rated offerings.[xliv] [67] However, the Chilean case was further complicated when Wikipedia Zero announced on 22 September 2014 it had negotiated with Subtel an exemption from the zero-rating rules.[xlv] [68]

## Brazil

Brazil enacted the *Marco Civil da Internet*[xlv] [69] popularly known as the Internet Bill of Rights, in 2014. This Law No. 12/965 was signed by the President of Brazil at the opening ceremony of the Net Mundial conference in São Paulo in April 2014. The *Marco Civil* provides for strong privacy, data security, freedom of expression and network neutrality principles and rules. The network neutrality provisions in the law require internet providers to treat all data on the internet equally, regardless of content, origin and destination, service, terminal or application. Article 9 imposes on ISPs a duty to adhere to the net neutrality principles:

*The party responsible for the transmission, switching or routing has the duty to process, on an isonomic[xlvi] [70] basis, any data packages, regardless of content, origin and destination, service, terminal or application.[xlvii] [71]*

The law only allows discrimination or degradation of internet traffic in two situations: technical requirements that are essential to the provision of the internet service, and prioritisation of emergency services.

A number of zero-rated offers have been established. Claro, a subsidiary of America Movil, started a partnership with Facebook Zero in 2010. Later, in April 2015, a few days after the President settled an agreement with Facebook to develop Internet.org in Brazil, it changed its commercial strategy and adopted the same approach as in other South American markets.[xlvi] [72] Claro started offering all its Brazilian customers free access to the three most-used social networks (Facebook, WhatsApp and Twitter). The benefit was offered to all types of clients ? prepaid, postpaid or controlled plan customers ? and data plans. Claro was the first local operator to remove charges simultaneously for all three social networks. TIM (the Brazilian subsidiary of Telecom Italia Mobile) has a partnership with WhatsApp with a zero-rating plan that allows subscribers to use the application when data caps are exceeded, while Oi has a similar arrangement with Twitter. Others, e.g. Vivo and Nextel Brasil, did not implement zero-rated offers.

Anatel, the national regulatory authority, has chosen so far not to regulate zero rating. However, it consulted on net neutrality in the spring of 2015<sup>[xlix]</sup> <sup>[73]</sup> during the course of which the zero-rating issue was thoroughly discussed, and the Ministry of Justice put the *Marco Civil* text into public consultation on 27 January 2016. The *Marco Civil da Internet* had already entered into force, but a further Regulation was required for net neutrality. This Regulation was done in a collaborative way, using a participatory platform, following the pattern of public debate used in developing the *Marco Civil*. Consultations (in two phases) were carried out and contributions used as inputs to the draft Regulation. Decree No. 8,771<sup>[l]</sup> <sup>[74]</sup>, which regulates the *Marco Civil da Internet*, was published in an extra edition of the Official Gazette of 11 May 2016. The Decree deals with discrimination between data packets in the Internet and of traffic degradation, indicates procedures for data protection, indicates transparency measures in the request of personal data by the Public Administration and sets conditions for inspection and verification of infractions.

The Decree was published with significant changes to the draft submitted to public consultation. The provisions introduced by the Decree regarding net neutrality are described below. The Decree specifies in detail a list of what would hypothetically be allowed as exceptions to net neutrality.

According to article 5 of the Decree, "technical requirements essential to the provision of the service" are:

- (i) addressing security issues, such as restricting spam and controlling denial of service attacks; and
- (ii) addressing exceptional network congestion situations.

Anatel, the national regulatory authority, is the institution responsible for the inspection and verification of infractions related to the exceptions to net neutrality indicated above, considering the guidelines established by an Internet Management Committee, CGLbr. Network traffic management practices, using techniques within established international standards, are also allowed, provided they comply with the parameters issued by Anatel and the guidelines issued by CGLbr (Article 6). Such practices must also be transparent for example by being included in contracts with end users and published on the operator's websites. Prioritisation of data packets due to business arrangements is expressly prohibited. However, the Decree does not make clear whether practices such as zero rating or sponsored access to internet applications are or are not considered a deviation to network neutrality and therefore unlawful.

## India

Concerned with the growing impact on the revenues of network operators, the Telecommunications Regulatory Authority of India (TRAI) issued a consultation paper on "Regulatory Framework for Over-the-top (OTT) services" on 27 March 2015.<sup>[li]</sup> <sup>[75]</sup> The objective of the public consultation was to analyse the implications of revenue substitution and consider whether or not the regulatory framework should be changed: e.g., should OTT players start being regulated and/or internet service providers be allowed to charge them a termination fee?

In addition, a high-level Committee on Net Neutrality submitted a report, (DoT 2015) released in May 2015, to the Department of Telecommunications. The report examines the issue of net neutrality and other associated areas. The Committee recommendations cover technical, regulatory and public policy matters required to address the net neutrality issue. Relevant recommendations made by the Committee are as follows:

- Telecommunications service providers (TSPs) must not restrict the ability of the user to send, receive, display, use or post any legal content, application or service on the internet, or restrict any kind of lawful internet activity.
- A clause, requiring adherence to the core principles of net neutrality should be incorporated in the license conditions of TSPs.
- Legitimate traffic management practices may be allowed but should be "tested" against the core principles of net neutrality. General criteria against which these practices can be tested are as

follows:

- Adequate disclosure of traffic management policies so that users can make informed choices;
- Application-agnostic controls may be used but application-specific controls within the 'internet traffic' class are not permitted;
- Practices like deep packet inspection should not be used for unlawful access to the type and content of an application in an IP packet;
- Improper (paid or otherwise) prioritisation is not permitted.
- There should be a separation of 'application layer' from 'network layer' as application services are delivered over a licensed network.
- The suggested enforcement process is as follows:
  - Core principles of net neutrality may be made part of License conditions, in addition to which the Licensor may issue guidelines from time to time.
  - The DoT should set up a team to deal with net neutrality cases. In case of violations, a two-stage process of review and appeal should be followed to ensure that decisions are objective, transparent and just.
  - Tariffs shall be regulated by TRAI as at present. Whenever a new tariff is introduced it should be tested against the principles of net neutrality. However, post-implementation, any complaints regarding a tariff violating the principles of net neutrality should be dealt with by DoT.
  - Net neutrality issues arising out of traffic management would have reporting and auditing requirements, which may be performed and enforced by DoT.
  - Quality of service and transparency requirements should be dealt with by TRAI.

The Committee was also exercised by the potential for regulatory and pricing arbitrage from OTT services, and specifically VoIP. It argued that there is no case for prescribing regulatory oversight similar to conventional communication services,<sup>[lii] [76]</sup> but called for 'a graduated and calibrated public policy response' to ensure that arbitrage 'does not dictate winners and losers in a competitive market for service provision'.

In December 2015, TRAI issued another Consultation Paper on 'Differential Pricing for Data Services'<sup>[liii] [77]</sup> This time, TRAI was concerned with the emergence of differential tariff plans set up by TSPs who started offering zero or discounted tariffs to certain websites, applications or platforms.<sup>[liv] [78]</sup> According to service providers, the objective of such offerings was to enable universal access to specific content on the internet.

Based on the responses received from stakeholders and internal deliberations, in February 2016 TRAI published the 'Prohibition of Discriminatory Tariffs for Data Services Regulations, (2) 2016'.<sup>[IV] [79]</sup> In the press release to announce the decision, TRAI asserted its commitment to net neutrality principles:

*While formulating the Regulations, the Authority has largely been guided by the principles of Net Neutrality seeking to ensure that consumers get unhindered and non-discriminatory access to the internet. These Regulations intend to make data tariffs for access to the internet to be content agnostic.*

The regulation prohibits Internet access providers from offering or charging discriminatory tariffs for data services on the basis of the content being accessed by a consumer.

## Australia

Australia does not have in place any specific ex-ante law governing net neutrality. Issues that might collide with net neutrality principles are thought to be addressable through the general competition regime managed by the Australian Competition and Consumer Commission (ACCC) and/or through existing ex-ante telecoms regulation. Internet service providers have put in place zero-rated offers and other forms of traffic management and differentiation. There has been a considerable public debate (Daly 2014<sup>[80]</sup>) on this issue in Australia. The main argument supporting forbearance is based on significant retail competition.



## South Korea

South Korea, a country that has amongst the highest broadband penetration and internet speeds in the world, has not officially adopted any legally binding decision on net neutrality. However, the regulator has published 'Guidelines for Network Neutrality and Internet Traffic Management', on 26 December 2011. These guidelines contain basic principles on network neutrality and traffic management practices, namely transparency rules and no unreasonable discrimination or blocking, but also recognise the need for reasonable traffic management.

On 10 February 2012, Korea Telecom blocked its subscribers from having access to internet sites such as YouTube through Samsung Smart TV. Korea Telecom stopped blocking access after serious complaints from its subscribers. However, the blocking of streaming video through Smart TV lasted for four days and reignited the debate over network neutrality in Korea.

In December 2013, the Ministry of Science, ICT and Future Planning (MSIP) intervened to forbid mobile network operators abusing the power of bottleneck ownership and issued new guidelines: 'Guidelines Regulation of Internet Access Service Traffic'. (Choi & Lee, 2014<sup>[81]</sup>) The key features of the Guidelines are summarised below:

- The Guidelines apply to internet access services in general, with the exception of managed services.
- Service Providers must take appropriate measures to promote network upgradability in tandem with corresponding increases in internet traffic.
- The Guidelines focus on traffic management issues: traffic management must be implemented only on a limited basis and within a reasonable scope.

The Guidelines seek to establish 'Standards for Determining the Reasonableness of Traffic Management' as the previous guidelines failed to clarify this issue. The following items were considered necessary in order to assess the reasonableness of traffic management schemes employed by the internet service providers:

- whether information relating to traffic management is sufficiently disclosed to the users (transparency);
- whether the traffic management scheme in question conforms to its intended goal and purpose (proportionality);
- whether implementation of the traffic management constitutes an unreasonable discrimination against other similar content (non-discriminatory);
- technical characteristics of the wired/wireless network in question.

The Guidelines also discuss what 'Types of Reasonable Traffic Management' may be allowed:

*The following types of traffic management may be deemed reasonable:*

1. *where such traffic management is necessary to maintain security and safety of the network by preventing malware, hacking, communication disruption, etc.;*
2. *where a service provider implements a traffic management scheme as a minimum necessary measure to protect multiple users from network congestion and to guarantee an environment for fair and equal use of the internet by all users; or*
3. *where such traffic management is required for enforcement of related laws or where such traffic management is requested by users based on related laws or user agreements.*

The Guidelines make clear that internet access providers must provide information relating to their services, such as the terms and conditions, procedures and methods of their traffic management schemes, and must also inform users upon implementing measures necessary for traffic management. Traffic management information must be published on the service provider's website. Additionally, the MSIP announced that VoIP services would be allowed on all mobile rate plans.



## 4. Overall assessment

Net neutrality is an alluring concept. It is also an elusive one. It is a term that speaks of fairness and non-discrimination, concepts whose abiding relevance is almost universally acknowledged and central to any policy framework for internet access. But the application of those concepts varies, with the result that there is no one-size-fits-all approach to net neutrality. Instead, having examined the key issues and reviewed the implementation challenges in a variety of countries we have come to the conclusion that:

- There is a minimum set of requirements that has been incorporated, in practice, into the regulatory regime in all countries that have tried to establish net neutrality rules. These include no blocking, no throttling, transparency, reasonable traffic management and QoS requirements.
- There is room for national variation especially with respect to two key issues: the extent to which paid prioritisation and zero rating is allowed. These practices can be prohibited (the US approach) or they can be allowed under strict rules to ensure that there is no degradation of service to standard internet users (the EU approach).
- In scoping net neutrality rules, there are a number of factors which need to be carefully analysed in each jurisdiction, namely:
  - The existing level of competition of retail broadband internet access services: A key difference between the US and EU is the market structure for internet access service providers. Due to the EU's wholesale unbundling policies, European networks tend to have less concentration in the market for retail broadband internet services, which tends to support net neutrality outcomes even in the absence of regulation.
  - Vertical integration between internet access services providers and content and applications providers. Most significant internet content providers are based in the US, so vertical integration is a much more substantial threat to net neutrality in the US than it is within the EU.<sup>[lvi]</sup><sup>[82]</sup> The vertically integrated ISP needs to be regulated to prevent favouring its own content and thus breaching net neutrality principles.
  - The level of congestion in the 'last mile' and backbone networks at peak times. The more congestion there is the more incentive ISPs have for paid prioritisation and the more likely prioritisation is to affect the quality of ordinary internet services.
  - The amount of existing local content with commercial appeal. In countries with little locally produced content or a fragile industry unable to compete with global players, the policy framework may well set an objective of encouraging locally created content. In such circumstances regulators have to be very careful not to damage the local industry either through zero-rating foreign content or an overly strict application of net neutrality. Instead, some exemptions for local content and applications may be offered.<sup>[lvii]</sup><sup>[83]</sup>
- Careful consideration needs to be given to the extent to which ex-post regulation is relied upon to deliver net neutrality. It is possible to rely entirely on ex-post decision-making (the Australian approach) but more commonly there is ex-post application of ex-ante guidelines (the US and EU approach). Unless there is a strong track record of relying on ex-post competition law, with the institutional capacity to handle net neutrality cases efficiently and effectively, it is better to establish ex-ante guidelines to provide some degree of confidence within the industry as to the nature and consequence of breaches of net neutrality. Ex-ante guidelines can also focus on the perceived weak points of the national environment but they will not, because they cannot, detail all possible circumstances or specify exactly what remedies will be applied. Ex-ante guidelines improve the transparency of decision-making and of intervention for the industry and thereby create improved certainty for investment. So ex-post regulation will also be needed, and the balance between ex-ante guidelines and ex-post decision-making will depend heavily on local circumstances.

It is possible, perhaps with the benefit of post-rationalisation, to see this framework in place within the different countries that have been profiled in this article. For example:

- In the US, deep concerns about the lack of retail competition, especially in fixed broadband, and about vertical integration have led to a strict set of ex-ante rules. Nevertheless, there is a predilection towards ex-post regulation in the US, so the FCC's Open Internet Order will ultimately be tested through the courts, which will also be responsible for imposing remedies (which are not specified in the Order).
- In the EU, competition is less of a concern but investment in new technologies (e.g. 5G mobile), in increased bandwidth (e.g. fibre rollout), and in innovation (e.g. European content) has made regulators more willing to consider quality-of-service differentiation. The ex-ante guidelines that have eventually emerged give freedom to ISPs to offer specialised services at higher prices, but only if ISPs simultaneously preserve the quality of service on the open internet. To achieve both of these goals, especially in the area of network congestion, further network investment will be required. The net neutrality rules may therefore be seen to achieve the overall policy goals of the Digital Agenda for Europe.
- In India the main regulatory concerns are about foreign application providers (OTTs) undermining the revenues of the local network providers and hence restricting their ability to invest in much-needed network roll-out. The net neutrality rules therefore delineate between networks and applications, and allow for traffic management within the network layer so long as there is transparency to the user who can then make informed decisions about the choice of applications.
- In Canada the emphasis has been on enhancing retail competition, giving the user a greater variety of services and enabling informed choices between them. The net neutrality guidelines therefore emphasise transparency and allow for variations in the quality/price offer so long as it does not discriminate against competitors.

It is also possible to apply this framework to a range of contemporary issues being faced by regulators in the net neutrality space. For example:

- **Ad-blocking.** In June 2016 the UK mobile operator, 3, offered a one-day opt-in trial in which it would block all advertising on its network (BBC News, 2016). It said it was doing this because advertisements count towards a customer's data charges, some advertisers exploit customer information and customers do not always want to see advertisements during web-browsing. Would such a service breach the EU's net neutrality rules? Ostensibly, yes, because the 'no blocking' rule is sacred. But users already have the opportunity of blocking adverts through commercial applications, and 3's offer was simply allowing users to make that choice via another mechanism. If the offer was clearly under the control of the user rather than the ISP, and if it treats all adverts in the same manner, then it may be seen as sufficiently broadly based, transparent and an application-specific form of traffic management.
- **Internet.org.** This Facebook-led initiative aims to overcome issues of accessibility, affordability and awareness to provide internet access in places where people cannot normally obtain or afford it. As of November 2016, 40m people had been connected via internet.org with free access to a range of basic websites. Is this altruistic or exploitative? It all depends on the approach taken to zero-rating, because economically, if not technically, internet.org favours some websites and blocks access to others. In developing countries the 'something is better than nothing' philosophy may argue for such an approach, but at some stage regulators should be more concerned about the practice cementing market power and tilting competition in favour of a company whose market capitalisation is about the same as the combined GDP of the 40 poorest African countries. It might be asked, if this is an altruistic exercise, then why cannot internet.org provide free access to the whole internet and not just to a carefully controlled part of it?

It is clear from these examples that net neutrality is really a philosophy rather than an axiom for regulation. At its core is the belief that the internet should be open equally to all, and access to it should not be restricted or controlled by anyone other than the user. But in the real world this article of faith comes up against technical and economic limitations as well as commercial interests. Regulators need to distinguish between the genuine constraints and the self-serving arguments. Guidelines are useful to present the over-riding principles and indicate how those principles are likely to be enacted in practice. However, the application of those guidelines and the remedies will need to be applied ex-post, in response to complaints and evidence of anti-competitive behaviour. The EU Regulation coupled with the BEREC Guidelines provides a solid foundation for this approach, and they will (with minor adaptation) be suitable in many other countries.

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## Endnotes

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[i] <sup>[110]</sup> End-to-end design here means that all end users can access all content available in the internet. Vertical integration between content owners and internet access providers could potentially lead to blocking of competing content or services and therefore disrupt this principle.

[ii] <sup>[111]</sup> As mentioned in the article, the concern that the vertical integration of cable firms with ISPs would prove a threat to the end-to-end design of the internet was first highlighted by Mark Lemley and Lawrence Lessig. As discussed in Wu's article several remedies could be thought to mitigate the potential harmful behaviour from ISPs. One of such remedies was allowing consumers their choice of ISPs, usually called an "open access remedy". Another was an anti-discrimination rule. The article argued that a discrimination rule was the best way to prevent harmful behaviour and as a means to keep a network neutral.

[iii] <sup>[112]</sup> As Tim Wu wrote in his website ([http://www.timwu.org/network\\_neutrality.html](http://www.timwu.org/network_neutrality.html)) <sup>[113]</sup>:

?Network neutrality is best defined as a network design principle. The idea is that a maximally useful public information network aspires to treat all content, sites, and platforms equally. This allows the network to carry every form of information and support every kind of application. The principle suggests that information networks are often more valuable when they are less specialised ? when they are a platform for multiple uses, present and future. (For people who know more about network design, what is just described is similar to the "end-to-end" design principle).?

[iv] <sup>[114]</sup> Taken from Save the Internet website, at: <http://www.savetheinternet.com/net-neutrality-what-you-need-know-now> <sup>[115]</sup> .

[v] <sup>[116]</sup> A detailed account of the history of Net neutrality in the European Union is provided in Chapter 2.

[vi] <sup>[117]</sup> Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services.

[vii] <sup>[118]</sup> Directive 2009/140/EC (Better Regulation Directive)

[viii] <sup>[119]</sup> Also provides advice on request and on its own initiative to the European institutions and complements at European level the regulatory tasks performed at national level by the NRAs.

[ix] <sup>[120]</sup> Summary of BEREC positions on net neutrality, BoR (12) 146b. The key question for BEREC in the net neutrality debate was on how much control operators could legitimately exert over the traffic on their networks.

[x] <sup>[121]</sup> Being able of setting a price above zero has always been a key claim of ISPs in order to support sustainability and keep up to network investments. Such payments would violate, most would argue, the net neutrality principles whereby no internet service provider should be allowed to charge content and applications providers' traffic in exchange for prioritisation or other discriminating acts against everyone else's traffic arriving simultaneously. Defenders of net neutrality fear that allowing ISPs to charge content and application service providers (CAPs) would lead to a so-called 'competitive bottleneck' where CAPs are in danger of being priced excessively. If pricing allows traffic discrimination (fast lanes), new firms with small size will probably not be able to pay these prices. Therefore their content will not be accessed. The likely outcome would be an increasingly concentrated market structure and reduced innovation in the edge of the network.

[xi] <sup>[122]</sup> This capability also allows benign forms of traffic management and filtering of malicious traffic, a desirable feature.

[xii] <sup>[123]</sup> Exponential growth of Internet users (3.2 billion users by the end of 2015 according with the ITU) enlarged its reach to an increasing number of less liberal political regimes and to cultures that have different conceptions regarding what is acceptable to be accessed in the Web. Nowadays, within a particular jurisdiction, technology developments allow subtle and sophisticated forms of breaking privacy of end users or subtracting data packets from the daily flow with variable and disturbing implications for individuals, companies or governments. Reconciling the specific characteristics of each country with the governance of an open Internet model faces considerable problems and certainly trade-offs between political and economic goals have to be reached when defining net neutrality.

[xiii] <sup>[124]</sup> Companies such as Akamai and Limelight operate servers closer to the 'last mile' internet service provider, hosting content for CAPs.

[xiv] <sup>[125]</sup> For more information see Rogerson (2013 <sup>[126]</sup>)

[xv] <sup>[127]</sup> In best effort networks other alternative ways for improving network performance not described here have been developed and have proven to be efficient and cost effective.

[xvi] <sup>[128]</sup> Cisco forecasts that there will be 3.9 billion Internet users using 24.4 billion devices and 67% of traffic will be generated by mobile devices in 2019. See Cisco (2015 <sup>[30]</sup>).

[xvii] <sup>[129]</sup> For further details see section 3 of this article "What is happening outside Europe ? USA".

[xviii] <sup>[130]</sup> It is notable that the Netherlands is one of the few EU countries with extensive cable competition and it is also one of the few EU countries in which significant net neutrality battles have been fought. See Figure 1.

[xix] <sup>[131]</sup> The package consisted of five Directives. The Framework Directive (2002/21/EC) provided the basis for future regulation of electronic communications networks and services, and was supplemented by specific Directives on Authorisation, Access and Interconnection, Universal Service and User Rights, and e-Privacy. The full package, including later updates, can be found at: [https://ec.europa.eu/digital-single-market/sites/digital-agenda/files/Copy%20of%20Regulatory%20Framework%20for%20Electronic%20Communications%202015](https://ec.europa.eu/digital-single-market/sites/digital-agenda/files/Copy%20of%20Regulatory%20Framework%20for%20Electronic%20Communications%202015.pdf)

[94] .

[xx] <sup>[132]</sup> Directive 2009/140/EC (Better Regulation Directive)

[xxi] <sup>[133]</sup> The current list of relevant markets is available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014H0710&from=EN> <sup>[134]</sup> .

[xxii] <sup>[135]</sup> Interestingly, neither document uses the popular term 'network neutrality'. Nevertheless, the definitions used by both the FCC and the EC are consistent with common definitions of net neutrality.

[xxiii] <sup>[136]</sup> Network slicing is an optimisation technique that partitions a single physical network into multiple virtual layers (or slices) each with defined minimum and maximum resource allocation parameters, and hence variable quality of service levels. Each slice can be optimised for different types of services and for different types of customer segments.

[xxiv] <sup>[137]</sup> This list of possible sanctions comes from Paragraph 178 of the BEREC Guidelines.



[xxv] <sup>[138]</sup> Web index available at: [http://thewebindex.org/wp-content/themes/wixWordpress\\_Theme-develop/visualisations/neutrality-full.html](http://thewebindex.org/wp-content/themes/wixWordpress_Theme-develop/visualisations/neutrality-full.html) <sup>[139]</sup> .

[xxvi] <sup>[140]</sup> Zero-rating is a commercial practice used by broadband internet access providers, especially mobile operators, which allows the data volume of particular applications or services not to count against the end user's purchased data cap.

[xxvii] <sup>[141]</sup> For example, ITU classified countries in three categories of approach to Net neutrality legislation: a) Cautious Observers, b) Tentative Refiners and c) Active Reformers. See ITU (2013) <sup>[142]</sup>.

[xxviii] <sup>[143]</sup> Canada later banned a specific zero-rating practice. For more detailed information read the case study below.

[xxix] <sup>[144]</sup> ?A person engaged in the provision of broadband Internet access service, insofar as such person is so engaged, shall not block lawful content, applications, services, or non-harmful devices, subject to reasonable network management.?

[xxx] <sup>[145]</sup> ?A person engaged in the provision of broadband Internet access service, insofar as such person is so engaged, shall not impair or degrade lawful Internet traffic on the basis of Internet content, application, or service, or use of a non-harmful device, subject to reasonable network management.

[xxxi] <sup>[146]</sup> ?Paid prioritization refers to the management of a broadband provider's network to directly or indirectly favor some traffic over other traffic, including through use of techniques such as traffic shaping, prioritization, resource reservation, or other forms of preferential traffic management, either (a) in exchange for consideration (monetary or otherwise) from a third party, or (b) to benefit an affiliated entity.?

[xxxii] <sup>[147]</sup> ?Broadband providers function as gatekeepers for both their end user customers who access the Internet, and for various transit providers, CDNs, and edge providers attempting to reach the broadband provider's end-user subscribers. As discussed in more detail below, broadband providers (including mobile broadband providers) have the economic incentives and technical ability to engage in practices that pose a threat to Internet openness by harming other network providers, edge providers, and end users.?

[xxxiii] <sup>[148]</sup> ?As explained in detail in the Open Internet Order, broadband providers not only have the incentive and ability to limit openness, but they had done so in the past.?

[xxxiv] <sup>[149]</sup> Footnote (6) of the Telecom Regulatory Policy CRTC 2009-657: ?Economic ITMPs include monthly bandwidth capacity limits, where users who exceed a predefined threshold must pay additional money for bandwidth consumed, and time-of-day pricing for bandwidth consumed.?

[xxxv] <sup>[150]</sup> ?In light of the above, the Commission directs Bell Mobility to eliminate its unlawful practice with respect to data charges for its mobile TV service by no later than 29 April 2015. Further, the Commission directs Videotron to confirm by 31 March 2015 that it completed its planned withdrawal of its illico.tv app for BlackBerry- and Android-based phones by 31 December 2014, thereby removing any undue preference for its mobile TV service, and ensure that any new mobile TV service complies with the determinations set out in this decision. This decision will favour an open and non-discriminatory marketplace for mobile TV services, enabling innovation and choice for Canadians. The Commission is very supportive of the development of new means by which Canadians can access both Canadian-made and foreign audiovisual content. However, mobile service providers cannot do so in a manner contrary to the Telecommunications Act.?

[xxxvi] <sup>[151]</sup> Available (in Spanish) at: <http://www.leychile.cl/Navegar?idNorma=1016570> <sup>[152]</sup> .

[xxxvii] <sup>[153]</sup> See <http://www.neutralidadsi.org/> <sup>[154]</sup> .

[xxxviii] <sup>[155]</sup> See <http://www.neutralidadsi.org/2009/02/05/vtr-limita-las-descargas-p2p-pruebas-concretas-nuevamente/> <sup>[156]</sup> .

[xxxix] <sup>[157]</sup> Available (in Spanish) at: [http://www.regulatel.org/wordpress/wp-content/uploads/2015/07/4.Neutralidad\\_de\\_la\\_red\\_version%20final.pdf](http://www.regulatel.org/wordpress/wp-content/uploads/2015/07/4.Neutralidad_de_la_red_version%20final.pdf) <sup>[158]</sup> .

[xl] <sup>[159]</sup> See <https://ongcivico.org/neutralidad-en-la-red/se-confirma-en-4-anos-subtel-no-ha-fiscalizado-la-calidad-de-la-banda-ancha-en-chile/> <sup>[160]</sup> .

[xli] <sup>[161]</sup> See <https://ongcivico.org/neutralidad-en-la-red/ong-civico-denuncia-abandono-de-deberes-de-subtel-en-fiscalizacion-de-calidad-en-acceso-a-internet/> <sup>[162]</sup> .

[xlii] [163] Derechos Digitales is an independent, non-profit Latin American organization founded in 2005 and whose fundamental objective is the development, defense and promotion of human rights in the digital environment: <https://www.derechosdigitales.org/> [164] .

[xliii] [165] <http://www.subtel.gob.cl/ley-de-neutralidad-y-redes-sociales-gratis/> [166] .

[xliv] [167] Wikipedia Zero works with mobile carriers to waive data charges on mobile devices to allow users free access to all Wikimedia sites. So far, this program has made the knowledge freely accessible to an estimated 375 million mobile phone users in 31 countries. Available at: <https://blog.wikimedia.org/2014/09/22/chilean-regulator-welcomes-wikipedia-zero/> [168] .

[xlv] [169] Available at (in Portuguese): [http://www.planalto.gov.br/ccivil\\_03/\\_ato2011-2014/2014/lei/l12965.htm](http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2014/lei/l12965.htm) [170] .

[xlvi] [171] In an equal way before the law.

[xlvii] [172] Art. 9: *O respons?vel pela transmiss?o, comuta??o ou roteamento tem o dever de tratar de forma ison?mica quaisquer pacotes de dados, sem distin??o por conte?do, origem e destino, servi?o, terminal ou aplica??o.*

[xlviii] [173] <http://www.bnamericas.com/en/news/telecommunications/claro-brasil-launches-plan-with-free-whatsapp-facebook-and-twitter> [174] .

[xlix] [175] (Consulta P?blica n? 8/2015 - Tomada de subs?dios sobre a regulamenta??o da neutralidade de rede, prevista no Marco Civil da Internet).

[l] [176] Available at: [http://www.planalto.gov.br/ccivil\\_03/\\_Ato2015-2018/2016/Decreto/D8771.htm](http://www.planalto.gov.br/ccivil_03/_Ato2015-2018/2016/Decreto/D8771.htm) [177]

[li] [178] To understand the underlying issues and prepare the consultation, TRAI conducted a seminar in August 2014, in which representatives of telecommunications service providers, OTT providers and legal experts presented their views. (TRAI, 2014 [179]) The consultation is available at: <http://www.trai.gov.in/WriteReadData/ConsultationPaper/Document/OTT-CP-27032015.pdf> [107] .

[lii] [180] However, national security must be safeguarded: National security is paramount, regardless of treatment of Net Neutrality. The measures to ensure compliance of security related requirements from OTT service providers, need to be worked out through inter-ministerial consultations.

[liii] [181] Available at: [http://www.trai.gov.in/Content/ConDis/20761\\_0.aspx](http://www.trai.gov.in/Content/ConDis/20761_0.aspx) [182] .

[liv] [183] In India there were several zero-rated options offered in 2015, one joining Internet.Org, owned by Facebook, with Reliance, and another from Airtel, the largest internet access provider in India. A battle? between the government and Facebook?s Internet.org ended when the authorities finally issued a regulation, the Prohibition of Discriminatory Tariffs for Data Services Regulations?, which bans zero-rated offers altogether. For a detailed description of the zero-rated discussion in India, see Marsden (2016 [184]) .

[lv] [185] Available at: [http://www.trai.gov.in/WriteReadData/WhatsNew/Documents/Regulation\\_Data\\_Service.pdf](http://www.trai.gov.in/WriteReadData/WhatsNew/Documents/Regulation_Data_Service.pdf) [186] .

[lvi] [187] For example, so far there has been no merger in Europe equivalent to the proposed merger of AT&T and Time Warner (or of Comcast and NBC-Universal).

[lvii] [188] See, for example, Futter & Gillwald (2014 [189]).

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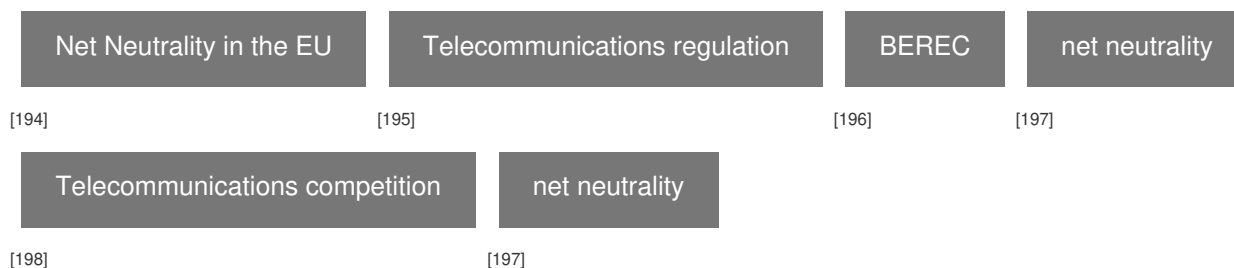
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