

# A Comparison of Network Neutrality Approaches in: the U.S., Japan, and the European Union.

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## 1. Introduction

In this paper, we compare and contrast the regulatory approaches to addressing Network Neutrality in three countries which represent three roughly different approaches. In the United States, which has suffered the most obvious Network Neutrality problems, the national regulator has promulgated a set of four policy principles aimed at preserving the open characteristics of Internet. These principles ensure Internet users the rights to: access lawful content; run lawful applications; attach lawful and non-harmful devices; and to have competitive alternatives. The U.S. FCC is currently considering extending those policy principles with two new ones. However, it has had significant problems attempting to codify and enforce actionable, legally binding rules. In October 2007, the Japanese MIC introduced Network Neutrality principles as an amendment to the “New Competition Policy Program 2010”. The policy requires that IP networks be accessible to content, to terminal equipment, and equally to all users, at reasonable prices. Network Neutrality also includes the concept of utilizing IP networks with the proper allocation of costs, and without discrimination. This is similar in concept to the “reasonable network management” exception embodied in the U.S. approach. In addition, a working group of four telecom business associations was created in September 2007 to develop a “Guideline for Packet Shaping”. The guidelines cover basic conditions for when packet traffic shaping is permitted, including measures to cancel heavy users’ contracts. Packet shaping should only be allowed in exceptional situations. The guidelines include the basic concept that ISPs should increase network capacity in line with increases in network traffic. As opposed to crafting ex-ante rules which describe the contours of permissible network practices, EU policy seeks to constrain market power by creating sector-specific rules designed to stimulate competition. The intention behind the EU approach is that competition will punish anticompetitive deviations from Network Neutrality.

We observe two approaches which seek to *ex ante* determine the bounds of permissible conduct by IP-based networks and one approach which eschews direct intervention in the problem. We analyse these three approaches, identifying the relative strength and weaknesses of each in the body of this paper.

### 1.1. What is Network Neutrality

The concept behind Network Neutrality is that network operators or Internet Service Providers (ISP) treat all IP packets transmitted over their networks more-or-less equally. Network Neutrality covers a broad range of behaviours, which at the extreme are clearly acceptable or not clearly not acceptable. Among the hotly debated behaviours include the possibility that an ISP might:

- offer better performance to some Internet content than to content from other sources;

- assess a surcharge where a customer wants to reach certain Internet content with better-than-standard performance;
- permit access only to affiliated content, and block access to unaffiliated content;
- assess supracompetitive surcharges for the use of certain applications, or of certain devices;
- disallow outright the use of certain applications, or of certain devices, especially where those applications or devices compete with services that the integrated ISP itself offers and for which it charges; and
- erect “tollgates” in order to collect unwarranted charges from unaffiliated content providers who need to reach the integrated ISP’s customers.

Several observers have concluded that deviations or violations against the principle in terms of operator applying different treatment to IP packets associated with different services, applications, destinations or devices treating network traffic differently to be inherently anticompetitive, welfare-diminishing, or simply unfair. Nonetheless, in many instances, it is perfectly fair to provide preferential treatment to some network uses, say premium customers or emergency services. In determining which behaviours are tolerable and which are not, regulators have to look at not whether the practice is unfair, but rather at the potential harms, such as the extortion of rents, tying and bundling, etc.

The challenge of determining what is acceptable and what is not is made more difficult by the fact that these behaviours can be insidious and difficult to detect. Network operators are loathe to disclosing the precise contours of their network management for legitimate reasons of competitive advantages and network security. Further, most Internet subscribers are not sophisticated enough to detect most deviations from Network Neutrality directly.

### ***1.2. Motivation and Methodology***

The Network Neutrality debate has generated much heat, but not much light. The debate reflects concerns that a network operator’s application of different and treatment to IP packets would result in harm to consumers or even a general welfare loss to society. However, many of the concerns that have been raised in regard to Network Neutrality relate to behaviours that, in the absence of market power, would tend to enhance consumer welfare. In a competitive market, these practices would be entirely appropriate. Competition is one of four essential ingredients for mitigating the negative impacts of deviations from Network Neutrality. The other three are: well informed consumers; low switching costs; and economic feedback loops that provide proper incentives. The presence of these four factors means that regulators have less work to do in order to ensure that welfare-enhancing differentiation does not devolve into welfare-diminishing discrimination.

In an environment of increasing rhetoric and decreasing analysis (at least in the U.S.), we seek to provide regulatory guidance to address Network Neutrality concerns. We do so by reviewing and evaluating the approaches in the U.S., Japan and the EU. We apply the same analytical framework to each country. We then review that framework to identify best practices.

### **1.3. Structure of the report**

This report proceeds as follows. In Sections 2, 3 and 4, we review regulatory approaches to network Neutrality in the U.S., Japan and EU, respectively. Sections 2, 3 and 4 are all structured to have three similar subsections. In the first subsection, we provide a brief discussion of the market in each country and the competitive state of play. In the second, we address the legal and regulatory undertakings to address Network Neutrality. The third subsection discusses the efficacy of the legal and regulatory responses and some of the prospects going forward. Following the review, we compare and contrast those approaches in Section 5. Finally, in Section 6, we offer our conclusions.

## **2. Network Neutrality in the United States**

### **2.1. Summary market analysis**

In discussing Network Neutrality issues, the discussion tends to focus exclusively on access network issues because this is where competition is the most problematic. In the U.S., the market for residential broadband has been growing increasingly concentrated. In the early- to mid-1990s, there were hundreds of small, regional ISPs providing dial-up Internet access using the PSTN. Since the introduction of cable modem service in 1997 and DSL in 1998, the small ISPs have disappeared.

In the States, there has been significant debate about the intensity of competition in broadband access networks in the US. The competitive situation in the market for broadband Internet access in the U.S. is frequently referred to as a duopoly. This can be seen in Figure 1 in the next page. According to the FCC's National Broadband Plan, 96% of all households are served by two or fewer providers.

The decline of competitive broadband alternatives for consumers was coincident with an aggressively deregulatory time period. Also coincident with this period, Network Neutrality appears on the U.S. scene. During this time, the FCC has effectively abandoned its historic procompetitive regulatory philosophy in favour of a deregulatory stance that is in effect pro-incumbent.<sup>1</sup> Beginning in 2002, the FCC began to remove the unbundling requirements on the incumbent telecommunications carrier which allowed competitors to obtain the

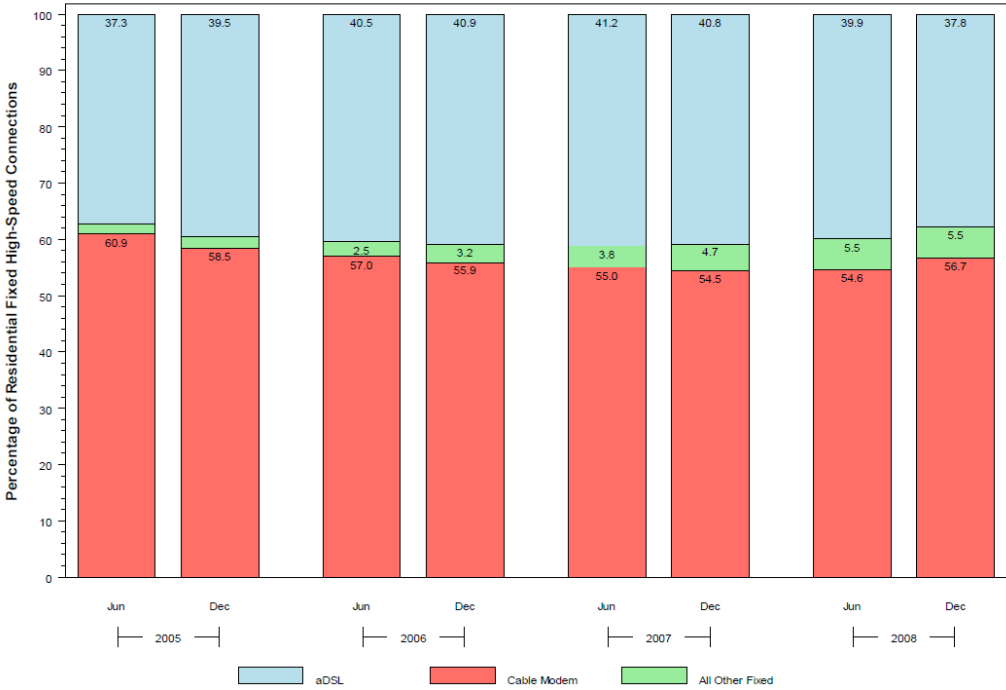
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<sup>1</sup> Marcus, J. Scott (2005): Is the U.S. Dancing to a Different Drummer? in: *Communications & Strategies*, Vol. 60, pp. 1-18, at: [http://www.idate.fr/fic/revue\\_telech/132/CS60%20MARCUS.pdf](http://www.idate.fr/fic/revue_telech/132/CS60%20MARCUS.pdf). Also available in *intermedia* (the journal of the International Institute of Communications), vol. 34, no.3, July/August 2006.

necessary network elements to provide broadband Internet access. Similarly, prior to 2005, telecommunications firms in the U.S. were not permitted to discriminate. In 2005, this restriction was removed putting telecommunications firms on par with cable operators who were not restricted so. Further, U.S. regulators no longer have explicit power to regulate broadband Internet service, in general. The FCC rulings of the past few years have placed broadband Internet access into the category of an unregulated information service.

Further, a series of court rulings in the U.S.<sup>2</sup> have taken the position that matters covered by the Communications Act<sup>3</sup> do not constitute a separate cause of action under antitrust (competition) law. Since this line of cases concluded that antitrust law is mutually exclusive with sector-specific communications regulation, they rendered competition law ineffective in areas subject to telecommunications regulation.

Figure 1. Residential Fixed High-Speed Connections, Shares of Selected Technologies, 2005-2008



(source: FCC, High-Speed Services for Internet Access: Status as of December 31, 2008)

**2.2. Approaches to addressing Network Neutrality**

Although the principles of common carriage, non-discrimination, device attachment, and

<sup>2</sup> Notably *Goldwasser v. Ameritech Corp.* 222 F.3d 390 (7th Cir. 2000) and *Law Offices of Curtis V. Trinko, L.L.P. v. Bell Atlantic Corp.*, 294 F.3d 307 (2nd Cir. 2002) (holding that conduct subject to the Telecommunications Act of 1934 as amended cannot serve as a separate cause of action under antitrust).

<sup>3</sup> The US Communications Act of 1934, as amended.

third-party neutrality have long been important areas of communications policy, Network Neutrality first appeared on the FCC's agenda in earnest in February 2004. In a speech at the Silicon Flatirons Symposium, then-FCC Chairman Michael Powell proposed four "Internet Freedoms" which he thought should be afforded to all Internet subscribers.<sup>7</sup> More than a year later, in August of 2005, the FCC, under Mr. Powell's successor Kevin Martin, adopted a Broadband Policy Statement. This statement does not have the enforceable weight of a Commission rule, but the Commission committed to incorporating these principles into future policymaking. The policy principles in the Statement were intended to "ensure that broadband networks are widely deployed, open, affordable, and accessible to all consumers." The Statement further set out four entitlements for consumers which it felt necessary to further this goal:

- consumers are entitled to access the lawful Internet content of their choice.
- consumers are entitled to run applications and use services of their choice, subject to the needs of law enforcement.
- consumers are entitled to connect their choice of legal devices that do not harm the network.
- consumers are entitled to competition among network providers, application and service providers, and content providers.

In a footnote, the FCC offered the caveat that, "all of these principles are subject to reasonable network management." This caveat is important for the Network Neutrality debate, inasmuch as traffic shaping, for instance, could under suitably circumstances be viewed as a form or network management.<sup>8</sup>

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<sup>7</sup> Remarks of Michael K. Powell Chairman, Federal Communications Commission At the Silicon Flatirons Symposium on "The Digital Broadband Migration: Toward a Regulatory Regime for the Internet Age" University of Colorado School of Law Boulder, Colorado February 8, 2004 (As prepared for delivery). Powell's four so-called Internet Freedoms were as follows:

*Freedom to Access Content.* First, consumers should have access to their choice of legal content.

*Freedom to Use Applications.* Second, consumers should be able to run applications of their choice.

*Freedom to Attach Personal Devices.* Third, consumers should be permitted to attach any devices they choose to the connection in their homes.

*Freedom to Obtain Service Plan Information.* Fourth, consumers should receive meaningful information regarding their service plans.

<sup>8</sup> The choice of the term "network management" was perhaps unfortunate. Network management has a well-defined meaning to engineers. It is not clear what the Commissioners had in mind with "network management". See, Kenneth R. Carter, et al., Network Neutrality: Implications for Europe, WIK

Given the broad and sweeping nature of the principles expressed in the Broadband Policy Statement, in conjunction with the lack of specific detailed rules, it is by no means clear what exactly could be enforced under the Broadband Policy Statement. Further, the Broadband Policy Statement was only a reflection of the views of the Commissioners at the time it was issued. Currently, only one of the five FCC Commissioners who were present when the statement was adopted is currently serving. Further, about the time the Broadband Policy Statement was issued, the FCC announced its intention to deal with violations of Network Neutrality through case-by-case adjudications.

The FCC's attempt to enforce the Broadband Policy Statement in an ad hoc case was its action against Comcast Corp. In the facts that gave rise to the case, Comcast was using re-set packets to stop the transmission of files in various peer-to-peer networks, notably BitTorrent. What is most interesting is that Comcast was only resetting the connections when non-Comcast subscribers were receiving files from Comcast subscribers. The reason Comcast engaged in this practice was probably to conserve network capacity for the files its subscribers deliberately wanted to exchange, not just offered to exchange passively. This would improve network performance for its paying customers without Comcast having to invest in adding additional capacity. This behaviour was in fact rather difficult to detect at first since most Comcast subscribers who could complain, would only observe better performance. The practice was only first noticed by Rob Topolski, a network engineer who was a Comcast subscriber. He was making his uncopyrighted Barbershop Quartet music freely available on BitTorrent. This is not the kind of music which would have a huge following; however, he was surprised to find that absolutely no one was downloading it. The fact that Comcast felt it could do this suggests that it felt it had some form of power. Further, Comcast had not disclosed this practice to its subscribers. It is questionable whether if disclosed, a Comcast subscriber would change providers. However, if every ISP were to engage in this practice, then all peer-to-peer networking would collapse.

After an AP story, in November 2007, Free Press, a public-interest organization, filed a complaint against Comcast and petition for declaratory ruling with the FCC. The FCC launched a proceeding against Comcast for failing to follow its Policy Principles, claiming jurisdiction to enforce federal policy. The FCC never alleged a violation of law or one of its rules. From the start, the process was problematic, in that the FCC was attempting to adjudicate a case with no underlying rules. Instead, the FCC launched what was really an administrative proceeding combined with an enforcement action. In the adjudicatory proceeding, the FCC sought to determine whether Comcast's actions were violating consumers' right to "run applications and use services of their choice," and the degree to which Comcast's action might constitute "reasonable network management practices." In addressing the latter concern, the FCC inquired whether Comcast's network management practices were "carefully tailored to its interest in easing network congestion."

To many observers, this was an odd approach for a normally pro-free market, Republican controlled FCC. In the end, the FCC found that Comcast was violating its policy and there was sufficient precedent to give the FCC the legal authority to order Comcast to:

- precisely disclose to the Commission its network management practices;
- submit a compliance plan with interim benchmarks; and
- disclose to the Commission and to the public the details of its future network management practices.

Naturally, Comcast appealed the ruling. The U.S. Circuit Court for the DC Circuit reversed the FCC's decision. The court's opinion is extremely well reasoned and articulate, leaving the FCC little room to appeal to the U.S. Supreme Court. The opinion brings into sharp focus, not the FCC's policy on Network Neutrality, but more narrowly its subject matter jurisdiction to impose such rules. It did not reach the merits of the FCC's order against Comcast nor its decision to couple an administrative proceeding with an enforcement action. Under its enabling statute, Congress granted to the FCC the authority to regulate communications by wire. Nonetheless, this is insufficient authority to regulate the network practices of ISPs. To the court, the FCC did not claim that Congress had given it the authority to directly regulate Comcast's ISP service; rather, the FCC had argued that it had so-called "ancillary" authorities to impose its order on Comcast. The court disagreed, concluding that such ancillary authority must be pursuant to a specific power or statutory responsibility delegated by Congress.<sup>9</sup> The FCC's general, enabling authority to regulate communications was insufficiently vague to constitute such a responsibility and the court rejected the contention that the FCC could exercise ancillary authority on the basis of policy alone.

Some have argued that the FCC does in fact possess the power to cure this jurisdictional defect by reversing a series of its decisions classifying Internet access as an information service. If broadband access services were classified as a telecommunications service (or at least in part), then the FCC would have subject matter jurisdiction over broadband access under Title II of the Act. This action might, however, bring with it a host of unintended consequences and legal and political risks.

When he took office, the new Democratic FCC Chairman Julius Genachowski committed to FCC's policy principles on Network Neutrality and to promulgating Network Neutrality rules. Thus, we can expect to see the FCC tackling the questions of subject matter jurisdiction and

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<sup>9</sup> The court relied on a two part test to determine when the FCC may exercise ancillary jurisdiction: (1) the FCC's general jurisdictional grant covers the regulated subject is covered by the FCC's general powers and (2) the regulations are reasonably ancillary to the performance of statutorily mandated duties. The court found the first condition satisfied, but the second unsatisfied. See, *Comcast Corporation v. Federal Communications Commission, et al.*, No. 08-1291 (DC Cir. April 6, 2010).



the policy questions. The FCC has circulated a Notice of Proposed Rulemaking which would codify the FCC's Broadband Policy Statement as Commission's rules. In addition, Chairman Genachowski would add two more principles. The two new policies, when promulgated as rules, would impose non-discrimination and transparency obligations on Internet access providers.

Also in parallel to the changes at the Commission, Congress has approved, as part of the Economic Stimulus Program, \$4.8 billion for the deployment of broadband infrastructure. This is the so-called BTOP and BIP and are administered by the NTIA and USDA's Rural Utilities Services, respectively. Networks deployed using funds from the grant program will be required to be open and neutral. Predictably, the major carriers in the U.S. have decided not to apply for BTOP grants – stating that they have sufficient access to capital already.

### **2.3. Efficacy to date**

The FCC's actions seemed to have quieted to some degree the allegations of violations of Network Neutrality. At the very least, the FCC has not brought any further complaints since the Comcast case.

That said, there have been some moves in Congress to enact Network Neutrality legislation, but the prospect of such legislation is slim. First, the Congress is currently hotly divided among party lines. This division makes the passage of any meaningful legislation extremely onerous and unlikely, particularly in an election year. Second, given the dynamic rate of change in terms of technology and economics the Internet market place, it is extremely hard to craft effect rules *ex ante*.

To be sure, there have and will be other testing cases of deviations from Network Neutrality in the wake of the Comcast case. A recent example of this battle is Apple Computer's App Store for its iPhone. In 2009, the Internet search behemoth Google launched a service called Google Voice. Google Voice is a unified messaging service, employing a single telephone number and includes follow-me services, call screening, voice mail, and speech-to-text transcribed voice mail. Google created a Google Voice app for use on Apple's iPhone. Initially, Apple rejected it for sale through its App Store. Apple has had an exclusive deal with at&t Wireless to sell the iPhone. Google Voice represents a potential competitive threat to at&t's mobile telephony business. If Apple had been proven to be acting on behalf of at&t, it would have raised questions of unfair competition. After much handwringing and public recriminations, Apple finally approved the application. Other recent cases include the following. Time Warner Cable's decision to introduce billing plans metered caps of 10GB, 20GB, 40GB, and 60GB, and its subsequent reversal of the decision in the face of customer dissatisfaction did not recede. There have also been allegations of Windstream's DNS hijacking, RCN's blocking of peer to peer traffic, and caps and the restrictions of most mobile wireless carriers.

What we expect to happen is that ISPs, device manufacturers, and content sources to continue

to struggle among one another to gain a large piece of the value chain. This continuing struggle to capture a larger share of the value chain presents a host of problems from this which adversely impact consumer welfare. For example, Google could have retaliated, perhaps by blocking access to its search function for at&t's residential subscribers. In this way, Google, at&t, and Apple would be attempting to leverage some form of dominance in one market into adjacent markets.

At the time of writing, August 2010, Google and Verizon announced a proposal on the carriage of certain types of Internet traffic and content. Since the information is still preliminary, we eschew discussing it here.

The fact that there have been no cases at the FCC level does not necessarily evince the presence of effective regulations. Rather, we view this as up to this point being ISPs responding to uncertainty. Possibly, some ISPs have not engaged in behaviours which could be considered violations to the Network Neutrality for fear of protracted litigation, political backlash, or negative public exposure. With the DC Circuit court decision, we expect that ISPs, particularly in regions that lack robust competition, will begin to impose more aggressive traffic shaping and discrimination in the coming months and years.

### **3. Network Neutrality in Japan**

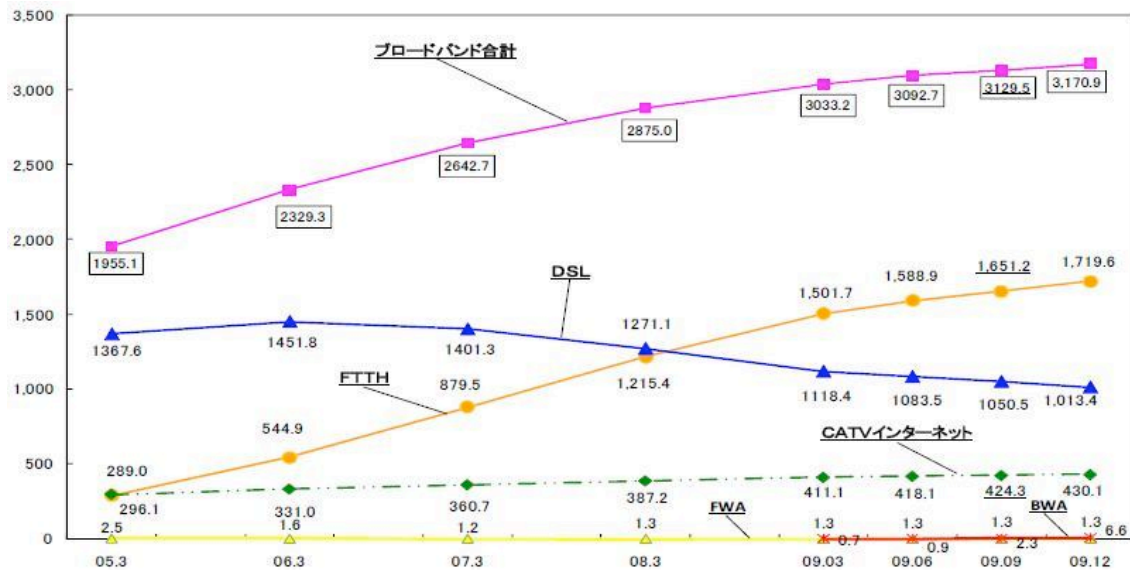
#### ***3.1. Summary market analysis***

Japanese market is characterized by extensive fiber deployment, declining service-based competition, and limited amount of facilities-based competition. The competition in ADSL market has been fierce, but the market is declining as subscribers migrate into FTTH services.

Broadband grew quickly during the first years of the 2000s driven by low-cost and widely available ADSL. The number of ADSL subscribers peaked in March 2006 at 14.5 million, after which users began to prefer the higher speeds and greater reliability FTTH service, available at almost the same cost. The total number of FTTH subscribers surpassed ADSL in April 2008, as shown in the Figure 2 in the next page.

Both ADSL and FTTH access networks are provided on an unbundled basis by NTT, the incumbent. There is some facilities-based competition from cable providers and competitive FTTH providers most notably regional power companies and KDDI, a telecommunications company. In some geographical areas, such as Mie prefecture, the market share of cable is larger than other competing types of access (see Figure 3 in the next page).

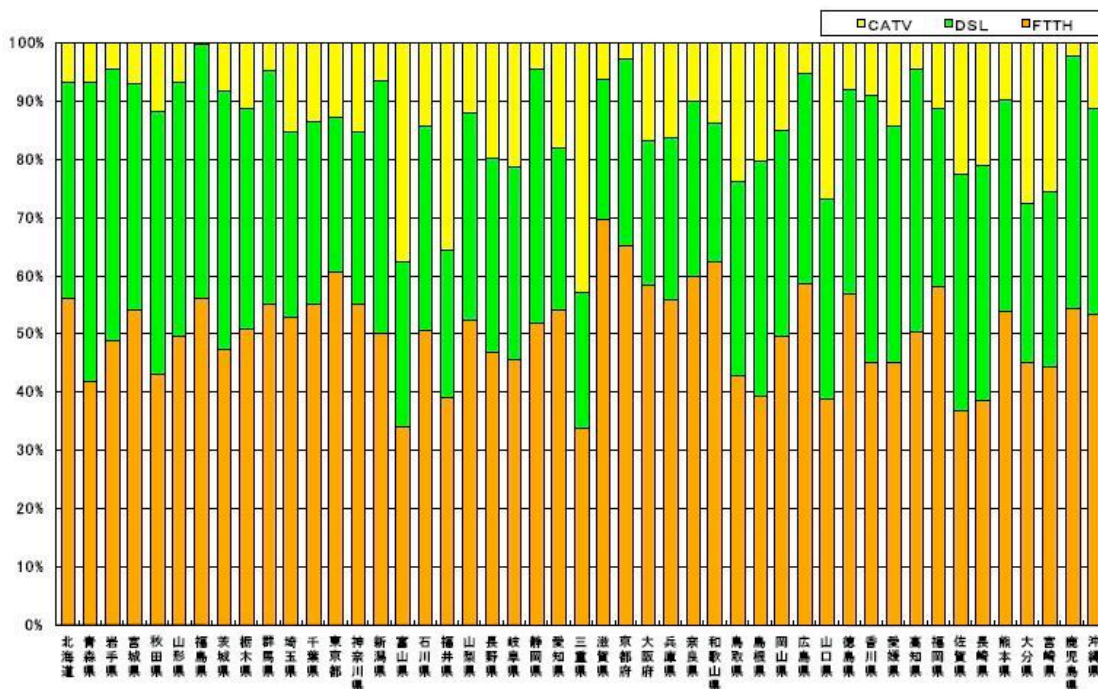
Figure 2. Number of Broadband Subscribers by platforms in Japan



(source: Japanese Ministry of Internal Affairs and Communications (2010) “Subscriber figures and shares in telecommunications services, publication of quarterly data for the third quarter of Heisei 21th fiscal year,” Attachment 1, p.6, resized for quotation).

1. (note in the original) The numbers do not necessarily match with the total for rounding errors.
2. The figures are in 10,000 subscribers
3. The line at the top shows the total for all platforms.

Figure 3. Share of different broadband platforms by prefecture in Japan, as of December 31, 2009.



(source: Japanese Ministry of Internal Affairs and Communications (2010) “Subscriber figures and shares in telecommunications services, publication of quarterly data for the third quarter of Heisei 21th fiscal year,” Attachment 3, p.3, resized for quotation).

1. Each bar represents each of 47 prefectures in Japan.

However, as illustrated by Table 1 below, NTT is dominant nationwide in FTTH, the fastest growing segment of the market, and has more than 50% of the total broadband access market. It is important to note that this was not always the case; NTT was never the dominant provider of ADSL, and only exceeded 50% of the total broadband market at the end of the second quarter of 2009.

Table 1. Broadband services and market share by key players, 25 December 2009

	Total	FTTH	DSL	Cable
Subscribers	31.7 million	17.2 million	10.2 million	4.3 Million
NTT <sup>1</sup>	51.6%	74.3%	35.2%	13.6%
Softbank <sup>2</sup>	12.6%	--	38.5%	--
KDDI	4.2%	7.6%	--	--
Power Co.	--	9.4%	--	--
eAccess	7.5%	--	23.3%	--

(Source: Ministry of Internal Affairs and Communications (MIC), December 2009)

<sup>1</sup>. Total for NTT East and West regional companies

<sup>2</sup>. 31 March 2010, Softbank ended the 2009 financial year with 237,000 FTTH subscribers using NTT’s unbundled fiber.

NTT is Japan’s incumbent telecommunications company, once wholly owned by the state. NTT was privatized during the 1980’s wave of privatization and deregulation, and it was further deregulated and broken up in subsequent years. Japanese government still owns one third of NTT’s shares. NTT’s corporate structure is currently being debated by government panel, with BT-like functional separation or AT&T-like structural separation both possibilities in the near future. NTT’s rivals in the broadband market, notably Softbank and KDDI, are calling for NTT’s fiber network to be spun-off as a separate company. The government panel is expected to make its recommendations on a broad basic level in mid-May 2010.

Both copper and fiber access networks are currently operated by the geographically separate NTT East and NTT West, while also in the NTT group, ISP businesses are run by NTT Communications (OCN) or its subsidiary (Plala). NTT East, West, Communications, along with NTT DoCoMo (mobile operator) and NTT Data (information systems business) are all owned by a holding company, NTT Corporation.

In 2001 the Ministry of Internal Affairs and Communications (MIC) introduced an open access regime requiring NTT East and West to lease their copper access lines to broadband ADSL providers at low tariffed rates, and to share their networks and facilities. Fair and non-discriminatory access to bottleneck facilities is an important feature of Japan’s telecommunications policy, and applies to both NTT’s copper and fiber access networks, and NTT’s inter-office fiber.

Access to low-cost copper and open access to elements of NTT’s fiber network provided the

foundation for the rapid growth of affordable broadband in Japan. It also created an important new market where, as we have already noted, NTT was not dominant. Throughout the history of DSL, despite NTT's control of the copper on which the service is based, the combined market share of NTT companies did not exceed 40 percent. One may say that the successful introduction of competition to a new and essential market was a significant policy achievement for MIC. However, some observers contend that the price competition was somewhat excessive in that it led the companies having a less than desirable amount of capital left for further investment into network build-out. Nevertheless, NTT kept its direction of pursuing FTTH deployment, this is in line with NTT's long-term project to replace copper network with fiber, to which DSL deployment is a detour, but partly in response to its less favorable position in the DSL market. Overall, copper unbundling seems to have boosted take-up while delaying investment.

The debate about Network Neutrality began in 2005 when MIC started discussions about future competition issues in an all IP network environment, particularly issues related to NGN. As discussions proceeded, two issues emerged to shape the process: First was concern over network congestion and the use of P2P technology. Second, NTT's dominance in the rapidly growing FTTH market marked a shift in the nature of the broadband market from one of intense competition among ADSL providers to a situation where NTT again had significant market power. The public debate about Network Neutrality intensified in 2006 when NTT and one of its subsidiaries publicly commented on video distributors and VoIP providers as "free-riders." These issues served as a backdrop of the government panel on Network Neutrality explained in the next section.

### ***3.2. Regulatory approaches to addressing Network Neutrality***

The Japanese approach to date is characterized by the lack of formal, specific rules, and broad authority granted by the law to the Minister of Internal Affairs and Communications.

Since the early 2000s, Japanese communications policy makers have been considering potential changes to the market caused by a shift to an all IP network environment, and been developing a roadmap for new competition rules to be implemented in the early 2010s. In 2006, as part of this discussion the Director of MIC's Telecommunications Bureau created a working group to provide recommendations on Network Neutrality. The working group was informal, its findings and recommendations non-binding, however its main recommendations were adopted in the "New Competition Promotion Program 2010" intended as the basis for revising the regulatory framework for the communications sector.<sup>11</sup> MIC was also aware of the FCC's policy statement on open IP networks and wished to consider these issues in the Japanese context.

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<sup>11</sup> See <[http://www.soumu.go.jp/main\\_sosiki/joho\\_tsusin/eng/.../news071023\\_2\\_ap.pdf](http://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/.../news071023_2_ap.pdf)> last accessed may 2010

The working group's discussions anticipated that an all IP network environment would see the emergence of vertically integrated carriers which would have greater incentives to discriminate against other access providers and other content and application providers. NTT's plans to create a next generation all IP network (NGN) was taken as the case in point, and how to regulate in this new NGN environment a major focus of the working group.

Discussions identified two key criteria to ensuring Network Neutrality: equal access to networks, i.e. neutrality of the network layer and other layers, and equitable distribution of costs of network operation, i.e. neutrality in cost sharing. At the same time concern over high levels of traffic generated by certain applications and disproportionate amount of bandwidth used by a small number of users was also considered, i.e. principles of fairness should also be considered in how networks were used so that one application or small number of users did not disadvantage other applications or users.

A unique aspect of Japanese Network Neutrality policy is that it considers not just the physical network and telecommunications service layer, in the context of NGNs it also addresses fair access to the "platform layer". These platform layer applications and services offer functionality for providing the smooth delivery of content and applications over the communications service layer such as authentication, quality of service, and digital rights management. The working group recommended these platform layer services should also be made available to competitors in a non-discriminatory and fair manner.

The Working Group on Network Neutrality published a report in September 2007, among its recommendations it proposed three principles on Network Neutrality.<sup>12</sup>

- IP networks should be accessible to users and easy to use, allowing ready access to content and application layers
- IP based networks should be accessible and available to any terminal that meets relevant technical standards and should support terminal-to-terminal (or "end-to-end") communication.
- Users should be provided with equality of access to telecommunications and platform layers at a reasonable price.

("users" refers to end users and content providers and other companies conducting business using IP networks.)

The working group emphasized that Network Neutrality also includes the concept of utilizing IP networks with the proper allocation of costs. The three principles were introduced as an

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<sup>12</sup> See Conference on the Neutrality of Networks

<[http://www.soumu.go.jp/main\\_sosiki/joho\\_tsusin/eng/studygroupreport.html](http://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/studygroupreport.html)> last accessed May 2010

amendment to the “New Competition Policy Program 2010” in October 2007.

The working group report recommends seeking consensus on action among industry players rather than creating confrontational situations. As we discuss in detail below, the working group also recommended the creation of an industry study group to look at issues of network congestion and packet shaping. It is clear MIC accepts that under the correct circumstances, packet shaping can be an appropriate course of action.

The working group’s recommendations are non-binding, and did not include specific discussion regarding monitoring of the industry practice, enforcement mechanisms, or sanctions. However, the Telecommunications Business Act grants a broad, general authority to the Minister on matters of discrimination and fairness. Telecommunications businesses are prohibited from engaging in unfair discrimination regarding the provision of telecommunications services.

Telecommunications Business Law (Fairness in Use), Article 6, “Any telecommunications carrier shall not discriminate unfairly in providing telecommunications services.”<sup>13</sup>

The term “telecommunications services” here means any service to provide telecommunications facilities to mediate communication of another entity. It is not limited to telephony, and certainly not limited to fixed or last mile services, although the exact scope is subject to interpretation. Telecommunication is defined as wire or wireless electric sending, transferring, or receiving of signal, audio, or image, and a broad reading of the language would allow email server to act on a common carrier-basis in the above mentioned manner. The fact broadcasting, cable television, cable telephony, and other businesses are explicitly excluded from the scope suggests that it covers a broad range of services. When one provides a server to the public for electronic bulletin board, for example, it is a telecommunication business. When the Minister of Internal Affairs and Communications finds inappropriate discrimination or some of the other grounds for intervention, he can order, to the extent necessary for securing users’ interests or public interest, the telecommunications business entity to change operation or do other things. An important distinction is that Japanese telecommunications legislation is applied to ISPs as common carriers and as such an enforcement mechanism could be said to exist for the three Network Neutrality principles the working group proposed.

Another notable outcome of the working group was the recommendation to create an industry study group to look into the issues related to network congestion and packet-shaping. A group of four communications industry associations with MIC as an observer first conducted a survey of industry practice and then developed a guideline on how to legally engage in

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<sup>13</sup> See Telecommunications Business Law

<[http://www.soumu.go.jp/main\\_sosiki/joho\\_tsusin/eng/laws\\_dt03.html](http://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/laws_dt03.html)> last accessed May 2010

packet-shaping, including application-specific and user-specific bandwidth throttling.

The guidelines, published in 2008, were developed for ISPs, and not the providers of underlying access networks. The survey's findings included that 25% of respondents were engaged in packet shaping in one way or another, and additional 11% were considering doing so. These ISPs claimed they began or would begin packet shaping so the flat-rate fee system for broadband access could be maintained. The subsequent guidelines pointed out that the assumptions held by some of the ISPs had little legal ground regarding how to avoid violating secrecy of communication, which is stipulated in the Telecommunications Business Act.<sup>14</sup> In other words, it is quite likely that some ISPs were shaping the traffic in an illegal manner. Somewhat strangely, however, it did not lead to any monitoring or enforcement discussions.

Instead, the guidelines cover the basic conditions for when packet shaping is permitted under the law, including measures to cancel heavy users contracts. The guidelines outline three basic principles:

- ISPs should increase network capacity when network traffic increases
- Packet shaping should only be allowed in exceptional situations
- Packet shaping should be justified by objective criteria

In other words, packet shaping should not be used as a means to avoid investment in networks, and the objective criteria to be considered are suggested to be issues such as the QoS of general users being degraded by traffic from other applications, e.g. P2P, or by excessive use by a small number of users. The guidelines also suggest users should be informed about their ISP's packet shaping policy in their contract terms and conditions, and that ISPs should also be required to provide relevant information to content providers and other ISPs. The guidelines go to great lengths to explain how packet shaping can be used legally considering the provisions of Telecommunication Business Law and the Japanese constitution regarding the secrecy of communications, particularly noting that the arbitrary use of packet shaping must be avoided.<sup>15</sup> The guidelines may apply to:

- Traffic restrictions on specific applications, e.g. P2P
- Traffic restrictions or cancellation of contract with heavy users who exceed certain traffic thresholds

The industry groups are currently revising the guidelines taking recent trends into

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<sup>14</sup> Telecommunications Business Law, Article 4, Protection of Secrecy

<sup>15</sup> National Diet Library <<http://www.ndl.go.jp/constitution/e/etc/constitution.html>> Japanese Constitution, Article 21(2) No censorship shall be maintained, nor shall the secrecy of any means of communication be violated. Last accessed May 2010



consideration. When the guidelines were first drafted the main concern was congestion caused by P2P traffic and a small number of users' excessive use. The level of P2P traffic has recently been falling as a proportion of total traffic, with the trend now towards streaming services.

As the name suggests, the guidelines are not enforceable in law, but they make clear that the Japanese position on packet shaping is that under the right conditions it is not necessarily a bad thing, what is important is defining what is reasonable and what is not. The guidelines implicitly apply to mobile networks, but mobile is not explicitly mentioned.

### **3.3. Efficacy to date**

The government's informal approach emphasizing the consensus building so far did not lead to particularly clear failure or vocal criticism. Neither did it create any obvious success, in terms of accelerated infrastructure deployment or innovation on the content and application fronts. Also notable, is that in related discussions, MIC has claimed its open network policies have not had a negative impact on NTT's investment in fiber local loops, with investment in fiber at approximately 40% of total investment each years since 2003.

After a series of discussions and as a direct outcome of the Network Neutrality report's recommendations, new regulations on basic interconnection with the NTT regional companies' NGN have been adopted. However, ISP industry is not very happy about the situation, regarding NGN interconnection with IPv6 networks. NTT East and West, in consultation with an ISP industry association, have proposed technical scenarios where the design of the next-generation fiber access service for IPv6 access limits the number of ISPs able to connect directly to the NGN to three representative ISPs. Later, the three national Internet Exchange operators, JPIC, JPNAP and BBIX were selected as the representative ISPs. Other ISPs would then need to ask these representative ISPs for OEM provision of IPv6 access. Some in the industry blame NTT for deliberately designing its NGN IPv6 network to inhibit other ISPs, a move tantamount to vertical integration through technical tying if true, but NTT's network arrangement could also be characterized as a result of simply implementing an international standard, hardly a controversial move.

Also reflecting recommendations of the Network Neutrality working group there has been progress on dispute resolution processes so that they apply across the broadband industry. The Japanese parliament is expected to review the broadcast law by the end of May 2010 and as part of that review the mandate of the Telecommunications Business Dispute Settlement Commission will be extended to consider disputes between communication carriers and upper layer content providers.

In some aspects, it is similar to the period after the FCC's adoption of policy statement and before Comcast debate. During this time Network Neutrality in the U.S. was characterized by some as an academic or hypothetical problem. Japan saw even less debate, both in the media and academia.

However, there are two major reasons to for the proponent of the neutrality policy to argue for more active governmental intervention. First, in the short term, ISPs would presumably continue the practice of packet-shaping, and it is not clear how much the ISPs follow the guidelines, which for the moment are not being monitored. For most end-users, simple congestion of the network would not be distinguishable from user-specific or application-specific bandwidth throttling, and there seems to be no mechanism to monitor ISPs' practices. But it is also true that ISPs have not rejected the markets traditional flat-rate fee system for broadband access in favor of tiered access or metered bandwidth, although some ISPs have announced some very high upstream bandwidth caps, in the range of hundreds of gigabytes of uploaded data/month.

MIC is monitoring progress with unbundling of subscriber optical fiber and the technical opportunities for more efficiently unbundling NTT's B-PON fiber network. It is widely understood that MIC considers the unbundling of essential transmission lines as essential to realizing a competitive environment in broadband services. This approach to regulation and consideration of functional or structural separation of NTT's access network by the government expert panel may alleviate the need for specific legislation on Network Neutrality.

Given that the survey of ISPs indicated that a substantial portion of the respondents were engaged in packet-shaping, a proponent could argue for further information gathering. Equally unknown is the network management practices of access network providers. Second, in the mid-term, the consumer choice may decrease because of the migration to the FTTH market, where NTT East and West have larger share, and the decline of independent ISPs due to the NGN IPv6 interconnection issue. One might argue that availability of unbundled fiber network from NTT is not generating enough competition in ISP business, and call for more explicit and strict imposition of network neutrality.

These reasons may or may not be enough for governmental intervention. For one thing, there has been no heated debate in the recent years, and there are not many technologically savvy public interest groups, such as Free Press, Public Knowledge and Electronic Frontier Foundation in the United States, that would play a role of watchdog and proponent. The detection of neutrality violations, and calling of public attention is not likely without some active proponents.

One source of uncertainty exists regarding the governmental interest in the fair sharing cost of infrastructure development. As noted above, Network Neutrality is being considered with two principles in mind: equal access to networks, and the equitable distribution of costs of the network. It has been suggested that MIC may reexamine the economics of the broadband market to determine how costs are allocated across the broadband ecosystem, to understand if, for example, content providers are "free-riding", or if they contribute equitably to the costs of the system as a whole. Nevertheless, the government panel sitting now to consider NTT's

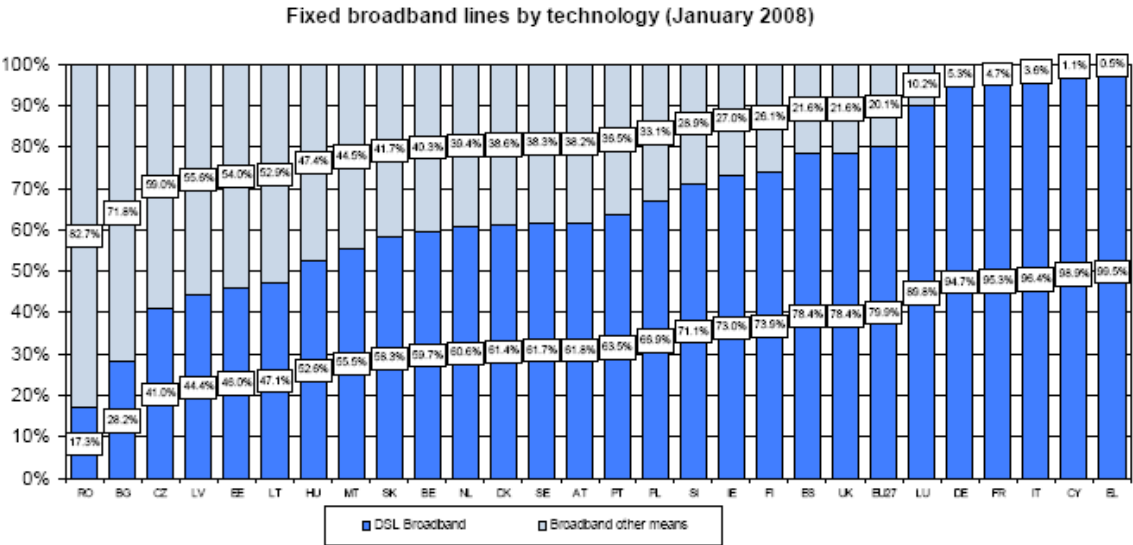
reorganization identified the distribution of costs an issue it thinks important.

**4. Network Neutrality in the European Union**

**4.1. Summary market analysis**

The European communications market is a relatively competitive environment. Most Europeans have more than two viable alternative providers of broadband Internet access. This is despite the fact that there is far less presence of cable television across Europe as a whole than in the U.S. In this regard, many EU markets resemble the Japanese markets. Nonetheless, the situation is highly varied from one Member State to the next, as shown in Figure 4. Countries like the Netherlands, Belgium, Denmark, Austria, Hungary, and Romania have quite substantial cable television presence, and substantial broadband Internet access over cable. France has very little cable, but nonetheless gets good competitive results as a result of intensive regulation. Italy has no cable to speak of. Germany has very extensive cable television, and adoption of broadband access over cable is increasing rapidly; however, adoption to date is still quite limited in Germany.<sup>16</sup>

Figure 4. Total fixed broadband retail lines in Europe by technology, January 2008



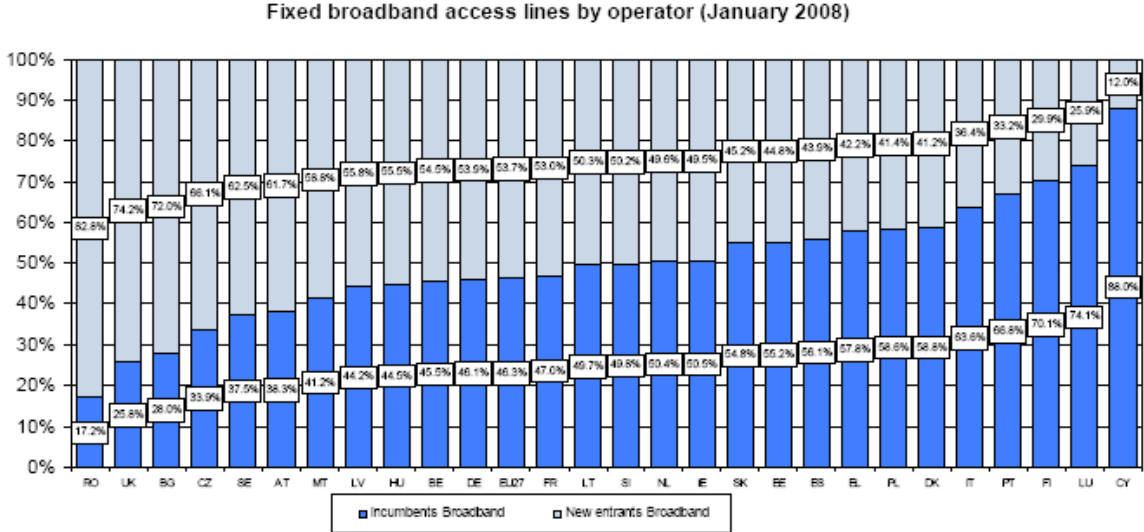
(source: European Commission, 13<sup>th</sup> Implementation Report, Annex 2, page 98. Note that “other means” includes cable television but is not limited to it.)

Much of Europe thus lacks a “second wire to the home”; nonetheless, overall competition is much more robust than in the United States. On average, more than half of all retail DSL lines in Europe are provided by competitive entrants. Averaged across Europe, more than

<sup>16</sup> See Marcus, J. Scott / Stamm, Peter (2006): Kabelinternet in Deutschland, at: [http://www.deutscherkabelverband.de/web/cms/upload/pdf/06-12-14\\_Studie\\_Kabelinternet\\_in\\_Deutschland.pdf](http://www.deutscherkabelverband.de/web/cms/upload/pdf/06-12-14_Studie_Kabelinternet_in_Deutschland.pdf).

40% of DSL lines are provided at retail by third parties, although the results vary substantially from one Member State to the next, as is shown in Figure 5.

Figure 5. European market share of fixed broadband access lines by operator (incumbent vs competitor) (January 2008)



(source: European Commission, 13<sup>th</sup> Implementation Report, Annex 2, page 98.)

In terms of Network Neutrality, competitive broadband based on wholesale alternatives (bitstream access, shared access or LLU) represent meaningful competition as long as the incumbent is prevented (by technical, regulatory or contractual means) from adversely impacting the quality of the service that the competitor offers to its end-user. This success in competitive alternatives stems from a European emphasis on pro-competitive and explicitly technologically neutral regulation is at the heart of the EU approach.<sup>17</sup> Regulation for electronic communications policy for the European Union is embodied in a set of five Directives originally promulgated by the European Parliament and the European Council in 2002.<sup>18</sup> The Directives provide for a harmonized approach, but allow for subsidiarity where legitimate differences in national markets make it appropriate. The Directives had to be transposed into national law and put into effect by July 2003; however, the process took a bit longer in some countries.

The core of the European Framework for electronic communications is established in the Framework Directive 2002/21, Articles 14–16. Market regulation takes place in a three-stage process: (1) market definition, (2) market analysis, and (3) imposition (where

<sup>17</sup> Framework Directive 2002/21 EC, Consideration No. 18.

<sup>18</sup> These were amending in 2009. See the discussion in Section 4.2.

needed) of remedies.<sup>19</sup> If a market is not effectively competitive, sector-specific regulatory obligations have to be imposed by National Regulatory Authorities (NRAs), which have the discretion to choose between measures such as transparency, non-discrimination, accounting separation, access and access price control, cost accounting, and retail price regulation.<sup>20</sup> Conversely, if markets are found to be effectively competitive (based on the absence of *significant market power (SMP)*)<sup>21</sup>, existing SMP remedies have to be removed. Wholesale markets for broadband are targeted by the Commission's recommendation on relevant markets<sup>22</sup> and therefore must be analysed by NRAs. In most Member States, incumbent operators have been found to possess SMP on the wholesale broadband market and are therefore subject to one or more of the aforementioned SMP remedies.<sup>23</sup>

These SMP-based regulatory prerogatives are complemented by a number of other regulatory powers. In Europe, competition law is viewed as an after-the-fact (*ex post*) complement to the application of anticipatory (*ex ante*) application of electronic communications regulation. To the extent that competition law addresses market failures such as tying, it provides a sophisticated alternative to regulation. These consumer protection powers are particularly important, in that they potentially enable NRAs to ensure informed consumer choice.

#### **4.2. Regulatory approaches to addressing Network Neutrality**

The set of five Directives for electronic communications policy, as they were originally enacted, did not address Network Neutrality directly.<sup>24</sup> Rather, they rely on the self-correcting functioning of a competitive market. That said, there has been some discussion as to how to deal with the issue of Network Neutrality in the context of the

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<sup>19</sup> See, e.g., Picot, A./ Wernick, C. (2005): Wettbewerbsregulierung in der Telekommunikation gemäß EU-Richtlinien und TKG, in: Wirtschaftsinformatik, Vol. 47, S. 222-225 for a more detailed discussion.

<sup>20</sup> See Cave, M. E. (2004): Economic aspects of the new regulatory regime for electronic communications services, in: P.-A. Buigues, & P. Rey (Eds.): The economics of antitrust and regulation in telecommunications: Perspectives for the new European regulatory framework (pp. 27–44). Cheltenham, Northampton, MA: Edward Elgar.

<sup>21</sup> Framework Directive 2002/21, Article 14.

<sup>22</sup> See EU-Commission (2007b): Commission Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, 2007/879/EC, L 344/65, Brussels, at [http://eur-lex.europa.eu/LexUriServ/site/en/oj/2007/l\\_344/l\\_34420071228en00650069.pdf](http://eur-lex.europa.eu/LexUriServ/site/en/oj/2007/l_344/l_34420071228en00650069.pdf).

<sup>23</sup> For an overview on notifications and decisions, see Community Consultation Procedures, at [http://ec.europa.eu/information\\_society/policy/ecomm/implementation\\_enforcement/article\\_7/index\\_en.htm](http://ec.europa.eu/information_society/policy/ecomm/implementation_enforcement/article_7/index_en.htm).

<sup>24</sup> For a full description of Network Neutrality in Europe see, Carter, Kenneth R. et al., (December 2008) Network Neutrality: Implications for Europe, WIK Diskussionsbeiträge Nr. 314.

framework. Proponents of Network Neutrality rules worry that market power on wholesale or even on retail markets might not represent the appropriate criterion by which to identify violations of Network Neutrality. Concerns were also raised as to the adequacy of competitive constraints, inasmuch as switching from one operator to another might be difficult. Broadband access is often sold in conjunction with long term contracts, which represent serious switching barriers. SMP regulation would probably not be able to deal with cases of discrimination. The original regulatory framework did not provide NRAs with the means to intervene if the quality of service for transmission in an IP-based communications environment is degraded to unacceptably low levels, unless the network operator in question is an SMP operator subject to a non-discrimination obligation. Instead, competition law might be the appropriate answer.<sup>25</sup>

The integration of additional regulation which aims to prevent violations against Network Neutrality seems challenging in the context of the European framework. However, as of yet, the European system of market regulation has proven to be successful, in particular due to the interaction of intra- and inter-platform competition and public policy measures.<sup>26</sup> One of its main features, the transition from regulation to competition law, could be impeded by additional rules.

There have been no precedents in Europe to date that would justify strong interventions in the current system. There have been few calls for additional obligations assuring Network Neutrality in the market, and no prominent cases of discriminatory behaviour against content operators. Nevertheless, there is some reason to believe that Network Neutrality could become an issue in Europe in the medium term as well, especially as new bandwidth-hungry services are deployed. This view was taken during the recent revisions to the European Framework. Beginning in 2006, the European Commission began the mandated process of making revisions to its rules to reflect experience up to that point, and to respond to changes in the marketplace. This process was not completed until November 2009 when the European Parliament and Council of Ministers reached an agreement. The 27 Member States must now transpose the new rules into national laws by June 2011.

In the context of the Framework Review, different alternatives to deal with Network Neutrality issues were considered: (1) to impose specific Network Neutrality rules; or (2) to make no changes to the existing regime; or (3) to maintain the existing regime, but to make appropriate improvements with regard to consumer rights. The Review proposals took this into account, in particular with regard to the strengthening of consumer rights and increasing

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<sup>25</sup> Valcke, Peggy/ Hou, Liyang/ Stevens, David/ Kosta, Eleni (2008): *Guardian Knight or Hands Off: The European Response to Network Neutrality: Legal Considerations on the Electronic Communications Reform*”, in: *Communications & Strategies*, No. 72, 4<sup>th</sup> quarter 2008, pp. 89-112.

<sup>26</sup> See Picot, A./ Wernick, C. (2007): *The Role of Government in Broadband Access*, in: *Telecommunications Policy*, Vol. 31, pp. 660-674.

choice of competing broadband service providers. The new rules hold certain importance for Network Neutrality. Among the requirements are full disclosure to network users by access providers of their network management practices. Should network providers wish to change these practices, they must disclose the changes to their customers and give them the opportunity to withdraw from the contract without penalty. The new EU rules, afford NRAs the power to set minimum quality levels for network transmission services so as to promote “net neutrality” and “net freedoms” for European citizens. In addition, new transparency requirements will help consumers to be informed – before signing a contract – about the nature of the service to which they are subscribing, including traffic management techniques and their impact on service quality, as well as any other limitations (such as bandwidth caps or available connection speed).

Article 8 paragraph 4(g) of the amended Framework Directive now reads: *The national regulatory authorities shall promote the interests of the citizens of the European Union by inter alia:... (g) promoting the ability of end-users to access and distribute information or run applications and services of their choice.*<sup>27</sup>

In the new Article 20 in the amended Universal Service Directive, would require that consumers must receive clear advance information in case a provider wants to limit access to certain content. Article 20 mandates that NRAs ensure that contracts offered by ISPs clearly specify, inter alia:

- information on any other conditions limiting access to and/or use of services and applications;
- the minimum service quality levels offered, namely the time for the initial connection and, where appropriate, other quality of service parameters; and
- information on any procedures put in place by the undertaking to measure and shape traffic so as to avoid filling or overfilling a network link, and information on how those procedures could impact on service quality.

Further, the Article provides, “that subscribers have a right to withdraw from their contract without penalty upon notice of modification to the contractual conditions proposed by the undertakings providing electronic communications networks and/or services.”

Addressing the issue of non-discrimination, the amended Universal Service Directive also allows NRAs the power to prevent degradation of quality of service by setting minimum quality levels for network transmission services for end-users. The new Article 22, No. 3 of the Universal Service Directive now reads:

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<sup>27</sup> Official Journal of the European Union, L 337, Volume 52, (18 December 2009).

*In order to prevent the degradation of service and the hindering or slowing down of traffic over networks, Member States shall ensure that national regulatory authorities are able to set minimum quality of service requirements on an undertaking or undertakings providing public communications networks.*

These changes represent both a strengthening of consumer protection and a commitment to unrestricted access to lawful content, applications, and services. They ensure that any relevant limitations are explicit. They introduce the possibility that deviations from Network Neutrality that are inconsistent with the terms of the contract could be addressed through contract law rather than through regulation.

In its accompanying impact assessment, the Commission provided information on its assessment on Network Neutrality.<sup>28</sup> In this document, the Commission summarised its concerns over Network Neutrality by noting that the potential of the Internet would be threatened if network or service providers rather than users were to decide which content, services, and applications could respectively be accessed, distributed and run.<sup>29</sup> The Commission emphasized the positive benefits associated with product differentiation so long as users have the choice to access the transmission capabilities and the services they want. The document says:

*“Allowing broadband operators to differentiate their products may make market entry of content providers more likely, thereby leading to a less concentrated industry structure and more consumer choice.”<sup>30</sup>*

The Commission is convinced that sector-specific regulatory issues raised in the Network Neutrality debate can be effectively addressed by the NRAs under the regulatory framework.

#### **4.3. Efficacy to date**

We conclude that to date there has no systematic failure regarding Network Neutrality in Europe. To date, the presence of competition has tended to deter deviations from Network Neutrality; however, NRAs and National Competition Authorities (NCA) need to be prepared to address wilful deviations from Network Neutrality, especially where an element of economic foreclosure appears to be present. There have been, to be sure, controversies and disputes over acceptable traffic shaping practices. In light of this, it is unlikely that a single set of *ex ante* rules would affectively address all of the challenges presented by Network Neutrality without running the risk of over regulation. Some of the disputes in Europe have centred on device attachment, bandwidth consumption by certain applications, and the ability

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<sup>28</sup> See EU-Commission (2007): *Commission Staff Working Document: Impact Assessment*, SEC(2007) 1472, Brussels.

<sup>29</sup> See *Ibid*, p. 91.

<sup>30</sup> *Ibid*.



to run certain applications on mobile networks. Most of these disputes have been resolved privately or with minimal intervention from the courts and regulatory authorities.

After Apple Computer launched its iPhone in the U.S. in 2007, where it is sold exclusively for use on AT&T contract, Apple launched it exclusively with T-Mobile in Germany in November 2007. The iPhone was equipped with an electronic SIM-lock disabling the use of the phone with any SIM card except the one provided by T-Mobile at the time of sale.<sup>31</sup> Further, the SIM-lock also locked other functions that were not directly related to the use of the provider's network, such as the iPhone's MP3 player, integrated camera, and Wi-Fi. In the U.S. and in many European countries, it is common for operators to lock mobile devices at least for the duration of the initial contract. In Germany, however, carriers have a similar practice for highly subsidised devices sold in combination with prepaid cards without a monthly fee; however, it had rarely been applied to devices sold in combination with a long-term contract. Explicit rules prohibiting SIM-locks have been enacted in some Member States, but not in Germany.<sup>32</sup>

Vodafone, T-Mobile's largest competitor, went to court and obtained an injunction against the exclusive distribution of SIM-locked iPhones by T-Mobile from the *Landesgericht* Hamburg. Vodafone asked the court to clarify whether T-Mobile's practices were in accordance with existing German law. Shortly after the Vodafone complaint, Debitel, a mobile telephony service provider, brought a complaint to the German NRA, the *Bundesnetzagentur*, regarding the terms of T-Mobile's contract. In order to avoid a possible fine, T-Mobile started offering unlocked phones without a contract for €999, compared to its standard price of €399 for SIM-locked iPhones sold in combination with a 24 month contract. Eventually, the court lifted the injunction and T-Mobile immediately stopped selling unlocked iPhones.<sup>33</sup> Since no party involved appealed the decision, the verdict became a precedent for German law after one month.

Also in 2007, BBC launched its online video streaming and download service iPlayer in the United Kingdom. Subscribers to this service are able to view programmes from the past seven days free of charge by playing them directly on the BBC iPlayer website or by downloading them to their computer. The iPlayer offers high quality video, and is designed

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<sup>31</sup> In general, it is necessary to distinguish between SIM-lock (which means that the particular end device can be used with one specific SIM card only) and Net-lock (which means that the particular end device can be used with any SIM card, but only in the mobile network of the specific operator).

<sup>32</sup> For example, Finland, Belgium and France prohibit SIM locks. On the other hand, Hungary prohibits unlocking of SIM locked end devices.

<sup>33</sup> In December 2008, the French Competition Council also issued a temporary injunction barring France Télécom and Apple Inc. from an exclusive distribution agreement regarding the iPhone. ARCEP had recommended the injunction; however, the original complaint was filed by Bouygues Telecoms.

for watching programmes in their entirety rather than the consumption of small vignettes. It relies on peer-to-peer networking to avoid download bottlenecks at peak times. The service is limited to people in the UK, and is funded by the £135.50 annual licence fee that each television owner pays to support the majority of BBC activities.<sup>34</sup> Due to heavy promotion on its TV channels and zero incremental price, BBC's iPlayer rapidly became UK's most popular Internet player shortly after its introduction in December 2007.<sup>35</sup> The rapid demand for this application put increasing pressure on the demand for bandwidth in access networks and in backhaul networks where demand is aggregated.

Following a series of industry complaints, Ofcom looked into the matter. In its market impact assessment,<sup>36</sup> Ofcom also tried to calculate additional costs for broadband capacity in connection with the iPlayer. Ofcom assumed that the average broadband customer, using these services would involve downloading an additional 3GB of data per month. The costs of the broadband capacity required to support the services could in aggregate be between £399 million and £831 million. Eventually, the BBC offered a compromise under the codename *Project Cheetah*.<sup>37</sup> BBC placed about 200 servers at various points in the BT network, including locations at local exchanges. These servers, or caches, will store the most popular iPlayer programmes in a place physically close to the viewers. By building its own transmission network, the BBC can bypass existing network bottlenecks; however, some argue that in order to cover the cost of serving up video to 80% of the population, 2,000 caches would need to be installed in local exchanges.<sup>38</sup>

More recently in 2009, T-Mobile, announced that it would block the VoIP and instant message application Skype on devices attached to its mobile wireless network. Skype, when not used for video telephony, consumes relatively little bandwidth due to compression technologies. This fact mitigates the concern for the need for T-Mobile to block the application being motivated by the need to shape traffic and ensure a certain level of Quality of Service. It is thus a fair question to ask whether the blocking of Skype is motivated by anticompetitive behaviour in an effort to block competing voice services from T-Mobile's network. At the time of writing, T-Mobile is allowing the Skype application to run on the handsets it sells;

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<sup>34</sup> See Telco 2.0 (2008): BBC's iPlayer nukes "all you can eat" ISP business model, at [http://www.telco2.net/blog/2008/02/bbcs\\_iplayer\\_nukes\\_all\\_you\\_can.html](http://www.telco2.net/blog/2008/02/bbcs_iplayer_nukes_all_you_can.html).

<sup>35</sup> See Palmer, Maija (2007): ISPs warn BBC over new iPlayer service, *Financial Times*, at [http://www.ft.com/cms/s/0/f3428cd4-48fb-11dc-b326-0000779fd2ac.html?nclink\\_check=1](http://www.ft.com/cms/s/0/f3428cd4-48fb-11dc-b326-0000779fd2ac.html?nclink_check=1).

<sup>36</sup> See Ofcom (2006): BBC's new on-demand proposals: Market impact assessment, London, 23 January 2006, electronically available under [http://www.ofcom.org.uk/research/tv/bbcmias/ondemand/bbc\\_ondemand/bbc\\_ondemand.pdf](http://www.ofcom.org.uk/research/tv/bbcmias/ondemand/bbc_ondemand/bbc_ondemand.pdf).

<sup>37</sup> See Garside, Juliette (2007): Broadband firms want BBC to share iPlayer costs, *The Telegraph*, at <http://www.telegraph.co.uk/money/main.jhtml?xml=/money/2007/12/23/cnbbc123.xml>.

<sup>38</sup> See *ibid.*

however, Skype is not permitted to run over its mobile network. Instead, the application only functions when it can connect through a Wi-Fi network such as a hotspot or home wireless LAN.

In our estimation, European courts and regulators are being vigilant possible anticompetitive discrimination, especially where there is a risk that network operator or service provider might leverage market power into an otherwise competitive upstream or downstream segment. Such harmful leveraging is potentially actionable by the NCAs *ex post* as a competition law violation. In such cases an ISP might be found to have market power by virtue of network externalities rather than according to standard tests of market power in one of the markets susceptible to *ex ante* regulation, and might be disinclined to offer fully effective interconnection in order to exploit its market power.<sup>39</sup> The European regulatory framework does not provide a comprehensive solution to interconnection problems in the absence of conventional SMP; however, Article 5(1) of the *Access and Interconnection Directive* provides NRAs with a sufficient tool to take necessary interim measures.

If intervention should prove to be required, the existing remedies already available under the European regulatory framework for electronic communications probably provides adequate tools, and competition law provides additional mechanisms. Non-discrimination obligations are already in place on most incumbents, and the NRA has the additional ability to apply Article 5(1) of the *Access and Interconnection Directive*.<sup>40</sup> The SMP remedies in the *Access and Interconnection Directive* (notably the Article 12 obligation to interconnect networks or network facilities) may be appropriate to force open interconnection in order to address Network Neutrality when network operators possess SMP. Aside from that, we see merit in the Commission's other proposals in this area, including the ability for NRAs to impose carefully crafted minimum quality standards on SMP operators. Finally, the Commission has also committed to keep the neutrality of the Internet under close scrutiny and to use its existing powers as well as new instruments available under the reform package to report regularly on the state of play in Network Neutrality to the European Parliament and the Council of Ministers.

## 5. Discussion

Network Neutrality concerns have been raised in the U.S., Japan, and the EU. The cases have included Comcast's peer-to-peer blocking, insidious packet shaping in Japan and the

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<sup>39</sup> See Katz, Michael L./ Shaprio, Carl (1985): Network Externalities, Competition, and Compatibility, in: *The American Economic Review*, Vol. 75, pp. 424-440; Crémer, Jacques/ Rey, Patrick/ Tirole, Jean (2000) : Connectivity in the Commercial Internet, in: *Journal of Industrial Economics*, Vol. 48, pp. 433-472.

<sup>40</sup> The NRA should bear in mind, however, that Article 5 needs to be used with caution and restraint, inasmuch as it is not linked to a finding of SMP. Further, it is not altogether clear what specific powers Article 5 confers on the NRA.

T-Mobile's blocking of Skype. Network Neutrality problems manifest themselves differently in each region.

### **5.1. Observations and comparisons**

The U.S. FCC, the Japanese MIC, and European NRAs have faced similar Network Neutrality problems, though in varying degrees of severity. The three regions have also applied different approaches to the problem. In the U.S., the regulator attempted to impose rules which *ex ante* determine the bounds of permissible conduct by IP-based networks. In Japan, we observe a hybrid approach which includes a statement of acceptable practices and pro-competitive regulation. Finally, the approach chosen by most European NRAs has been to largely eschew direct intervention and trust that a competitive market will solve the problem. Competition law can serve as an *ex post* complement.

Europe and Japan today enjoy a far more competitive broadband market than does the United States. On average, more than half of all retail DSL lines in Europe are provided by competitive entrants. In Japan, Softbank has outperformed NTT in the DSL market since the broadband boom started. But in an interesting twist to what had been a highly competitive market, NTT has fought back through the success of FTTH and is on a path to becoming as dominant in broadband as it was in telephony. This trend is one reason for concern about maintaining network neutrality in Japan.

Thus, the first line of defence for policymakers should instead be to avoid the problem altogether by maintaining the competitiveness of the underlying markets. Occasional or sporadic problems related to Network Neutrality might be addressed *ex post* through the exercise of competition law.

In both Europe and in the United States, a key regulatory philosophy has historically been to regulate only where necessary to address market power. In the EU, the adoption of economic tests based on competition law, coupled with the institutional separation of powers between the European Commission and the Member State National Regulatory Authorities (NRAs), have helped to enforce independent, objective decision-making.

### **5.2. Recommendations and best practices**

To conclude, any effective regulatory strategy to addressing Network Neutrality will comprise a broad spectrum of approaches, including *ex ante* principles, pre-specified guidelines for acceptable practices, and precompetitive regulation. Specially, our observations support 6 rules of thumb:

1. There is no "one-size-fits-all" solution to Network Neutrality.
2. Trying to address Network Neutrality challenges through *ex ante* regulation is likely to prove extremely difficult.

3. Where there is effective pro-competitive regulation, Network Neutrality issues tend to be less problematic.
4. Industry buy-in in terms of crafting best practices and a clear statement of acceptable carrier and subscriber behaviour can be helpful, particularly where the underlying markets are competitive.
5. The ex post application of antitrust and competition law are important complements to ex ante measures in order to ensure welfare-enhancing traffic shaping behaviours.
6. Transparency (disclosure) and compliance (enforcement) mechanisms are important, particularly where the traffic shaping behaviours are difficult to detect.

The problem is far too complicated that even the most sophisticated regulator could craft one set of meaningful rules to enforce a Network Neutrality solution. It is unlikely that a single set of *ex ante* rules would affectively address all of the challenges presented by Network Neutrality without running the risk of over regulation. At worst, a lack of sophistication on the part of decision makers would inevitably lead to subjective and imprudent decisions. Further it may prove impossible for those rules to distinguish between welfare-enhancing discrimination (such as advertising-supported content) versus anticompetitive discrimination. Thus, the market must be empowered to constrain behaviour in the most economically efficient way. To achieve this, a clear statement of acceptable carrier and subscriber behaviour is necessary. However, where competition is imperfect, there will be the need for some regulatory intervention. Since Network Neutrality is a subset of competition problems, efforts to address Network Neutrality should focus on solving the underlying lack of competition, not the instant network traffic management issues. The absence of competitive constraints, the regulator must impose obligations.

The one area where preventive regulatory measures should be considered is in ensuring that consumers have the information they need to make informed choices. NRAs should mandate ISPs provide consumers with a public statement as to the circumstances under which they would intentionally block access or degrade the quality of access to a site or a service (for example, to block denial-of-service attacks). Japan's industry-developed packet shaping guidelines offer useful examples of when and under what conditions network management should occur and how consumers and other ISPs and broadband users should be informed. Further, minimum quality standards need to be used cautiously – overly zealous use could actually *reduce* consumer choice by preventing competitors from bringing to market connectivity services of lower quality that might nonetheless be perfectly acceptable to some consumers.

In the absence of market power and high switching cost, the extent the deviations from Network Neutrality adversely consumer happiness, consumers would punish the offending network by switching to a different provider. To ensure this result, consumers need be

adequately informed. The regulator should be focused on introducing or reintroducing effective, sustainable competition. For these purposes, service-based competition might be sufficient. Should marketplace competition erode to the point where regulation is necessary, all of the choices tend to be unattractive. In the final analysis, addressing these concerns, the objective of the regulator should be less about divvying up rents and more about how to make inciting competition.

## **6. Conclusion**

In sum, we are still faced with the following trilemma: 1) it is very hard to describe *ex ante* what is a serious and significant violation of Network Neutrality; 2) it is very hard to make broad, sweeping concepts actionable or enforceable as rules; 3) if left to their own devices, uncompetitive markets will allow traffic shaping, as well as other practices, which are welfare-diminishing.

The most effective way to promote welfare-enhancing differentiation as opposed to anti-competitive discrimination is the presence of effective, sustainable competition. This is, by no means, a guarantee. As several U.S. experts correctly observe, the U.S. has four major wireless carriers, but no truly open mobile networks. Nonetheless, in the absence of competition to constrain the behaviour network providers, some form of regulation will be required. Once the regulator is required to dictate allowable and unallowable network practices, all of the options are unattractive. The market and technology moves too quickly for administrative or legislative management, making effective competition the best fix. In the presence of effective competition, informed consumer choice and low switching costs, the market will punish welfare-diminishing discrimination.

This is easier said than done. Managing competition is difficult. This is especially true where there is an entrenched, powerful incumbent. This leads to politicized rulemaking and even regulatory capture. Nonetheless, the profit motive is a sufficiently corrupting influence that it must be constrained. The best constraint is the behaviour of numerous competing suppliers.

The regulator should view itself as not dividing up a pie among rent-seeking incumbents. Rather, it should seek policies which make the whole pie larger, by encouraging more participants, more network providers, and more content suppliers to join the network.