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I. THE ORIGINS OF THE NET NEUTRALITY DEBATE IN THE UNITED STATES

The Net Neutrality (“NN”) movement essentially believes that the traditions of the internet ecosystem should not be altered. The NN debate originated in the United States, and particularly gained momentum after it became public that large Internet Service Providers (“ISPs”) overtly or covertly tried to change some of these traditions. The most prominent acts of alleged NN violations that especially stimulated the debate in the United States were:

1. The 2005 Madison River Communications case, which accused Madison of blocking voice-over-IP (“VoIP”) internet traffic because it was in competition with Madison’s regular telephone service;
2. The 2008 Comcast case, which accused Comcast of restricting the flow of peer-to-peer (“P2P”) traffic in its networks in order to reduce costs; and
3. The 2005 statement of former ATT CEO Ed Withacre, who announced that, in order to refinance the networks, content and service providers (“CSPs”) should pay an additional fee to the eyeball ISPs where the CSP’s traffic terminated.

To understand why these acts are considered a violation of NN, it is important to recapitulate two fundamental traditions of the internet that built the foundation of the NN movement. The first is the *best-effort principle*, which means that intermediate network nodes (routers) forward internet messages (packages) on a first-come-first-served basis. If routers’ queues are full, new incoming packages are deleted and must be resent, again according to first-come-first-served. Therefore, due to the best-effort principle, all packages should be treated equally, independent of their source, destination, or content. Thus, the first and second cases cited above are seen as a violation of the best-effort principle.

Second, there is a tradition that CSPs *pay only once* for being connected to the internet, and not again for being able to deliver their traffic to end customers. The problem is that CSPs usually have a contract with some backbone ISP, who grants them access to the network, but not with the eyeball ISP, who has a terminating monopoly over the end customers. Thus, in the third case, the eyeball ISP wanted to exercise this market power and demanded extra fees from the CSPs.

In this article, we shall look briefly behind the rationale of such violations of NN and discuss whether they are specific to the U.S. internet market, or whether they apply in Europe as

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well. Finally, we conclude by summarizing the current state of legislation with respect to NN in the United States and Europe.

II. NET NEUTRALITY VIOLATIONS AND MARKET POWER

The NN debate is essentially a debate about market power. It is neither clear nor obvious that the above-mentioned traditions of the internet are, in fact, the main reason for the internet's success. They stem from a time where the internet was still a closed research network and not subject to market forces. Therefore, it is interesting that the debate is at its peak today, over twenty years after the internet was commercialized. In particular, NN proponents have three main concerns with respect to eyeball ISPs, all of which relate to market power.

A. Exercising Market Power With Respect to Terminating Traffic

ISPs claim that their investments in the network are hardly counter-balanced by new revenues from end users. In reverse, CSPs benefit from the increased bandwidth of the customer access networks, which enables them to offer even more bandwidth demanding services, which, in turn, leads to re-congestion of the network and a new need for infrastructure investments. Eyeball ISPs have termination monopolies over their end customers. Therefore, they would like to exercise their market power by demanding a termination fee from CSPs, similar to what is already done in the traditional (fixed and mobile) telecommunications industry.

This market power comes from the fact that internet users usually have a contract with a single ISP, and are additionally bound by a minimum term to this contract. In this respect, there is no difference between Europe and the United States. However, in the United States, the availability of alternative ISPs is even more limited than in Europe. Especially in rural areas of the United States, often only one ISP (usually the cable operator) is available. In Europe, which is more densely populated, the overlap between cable and telecommunications infrastructure is more widespread, and thus allows for infrastructure-based competition. Therefore, the market power in terminating traffic is probably considerably less pronounced than in the United States.

Nevertheless, with respect to this issue, the European NN debate has focused around the same aspects. In particular, there are two forms of non-NN scenarios that are discussed:

1. First, a classic termination fee would mean that CSPs pay the eyeball ISP for connectivity (a service which previously had been free), but do not get any other advantages in return. According to the economic literature,² this scenario is likely to be welfare decreasing for CSPs. However, the effects on overall welfare are ambiguous, and not, as some NN proponents claim, necessarily detrimental. The main reason is that end users may end up paying less under such a two-sided pricing regime, again, of course, subject to market power. Additionally, there is also a deep-rooted belief (in the United States and Europe) that a positive termination fee will inevitably lead to less content (i.e., content and service innovations) and eventually to a fragmentation of the internet.³ The latter is considered to

² N. Economides & J. Tag, *Net Neutrality on the Internet: A Two-Sided Market Analysis*, INFORMATION ECON. & POL'Y (forthcoming).

³ Lee & Wu, *Subsidizing Creativity through Network Design: Zero-Pricing and Net Neutrality*, 23(3) J. ECON. PERSPECTIVE. 61–76 (2009).

be a result of the ISPs' desire for differentiation, which they attempt to achieve through exclusive content.

2. A second, less obtrusive scenario would be that those CSPs that pay extra would get, in return, a prioritized access to the end customers. On the other hand, the CSPs that do not pay extra maintain their connectivity to end customers through the best-effort class. The extant economic papers on this issue show that this so-called CSP tiering scenario is likely to be welfare-enhancing if the ISP acts in non-discriminatory fashion.⁴ In particular, non-discrimination means that priority access is sold under the same conditions to all CSPs and that the ISP does not sabotage the connection quality of the best-effort class (a practice known as the "dirt road fallacy"). However, the appropriate remedies to counteract such practices are obvious. Regulators could demand non-discriminatory pricing (e.g., by requesting ISPs to make their terms public) and, in the case of the dirt road fallacy, set a Minimum Quality Standard ("MQS").

If these concerns are under control, CSP tiering increases efficiency and content variety because it allows congestion-sensitive CSPs to enter a market that requires some Quality of Service ("QoS"), e.g., CSPs that offer real-time applications. These CSPs could not have offered their service in a best-effort network. In comparison, the welfare loss that is due to the congestion aggravation to those CSPs that are congestion insensitive (e.g., CSPs that offer text-based content) is negligible.

However, under CSP tiering, ISPs would additionally violate the best-effort principle and thus NN proponents view it very skeptically. In the United States, the FCC has proposed to forbid such pay for priority arrangements "in the matter of preserving the open internet,"⁵ because it believes that it would distort competition between large CSPs, who can afford to pay for priority, and small CSPs, who cannot.

In Europe, there is currently no such articulated concern by a regulatory authority. However, pay for priority arrangements are subject to close scrutiny. In Germany, for example, the government commissioned a committee of inquiry (partially comprised by politicians and partially by experts) on different issues of the digital economy, among which was also the issue of NN. In its final report, which is also intended as guidance to the national regulatory authority, the committee did not come to a consensus with respect to CSP tiering.

B. Exercising Market Power With Respect to Relaying Traffic

ISPs may also exercise market power with respect to how they relay the traffic through their networks. Two scenarios are possible:

1. First, regarding the availability of QoS techniques, ISPs may be tempted to prioritize affiliated content or, in reverse, to degrade or block traffic of content that is harmful to

⁴ J. Krämer & L. Wiewiorra, *Network Neutrality and Congestion Sensitive Content Providers: Implications for Content Variety, Broadband Investment and Regulation*, INFORMATION SYSTEMS RESEARCH, (forthcoming); C. Reggiani & T. Valletti, *Net neutrality and innovation at the core and at the edge*, UNIV. OF MANCHESTER, (1202) THE SCHOOL OF ECONOMICS DISCUSSION PAPER SERIES 1–35. (2012).

⁵ FCC 10-201, REPORT AND ORDER: IN THE MATTER OF PRESERVING THE OPEN INTERNET BROADBAND INDUSTRY PRACTICES (December 2010).

the ISP's other revenue streams. This argument applies mostly to ISPs that are vertically integrated with large CSPs (as in the case of AOL-TimeWarner) or that originated from a telecommunications company (like most DSL-based operators). The threat of abuse of market power by vertically integrated ISPs applies predominantly to the United States where internet access is mainly provided by large cable companies. Although this concern has been articulated in academic articles,⁶ no actual case is yet known. By contrast, there exist several examples of ISPs that have blocked VoIP traffic to prevent profit setbacks from the traditional voice service. Case one from above is the most prominent one. However, in Europe this is also a common practice. T-Mobile Germany, for example, explicitly forbids the use of VoIP services in its network unless the customer pays an extra fee.

2. Second, the ISP may use traffic management techniques to avoid or limit traffic that, in its view, generates nothing but costs. Here, the most prominent example is case two from above; however, the European ISPs do exactly the same. Empirical tests from 2009 have shown that all large European ISPs interfere with the traffic flows in their network, particularly with respect to P2P traffic.⁷

C. Exercising Market Power With Respect to Originating Traffic

Finally, QoS techniques may also be employed to provide tiered internet access to end users (as opposed to CSP tiering), or to manage the traffic of certain end users (as opposed to certain protocols). Usually, there is a very small fraction of customers that causes a significant share of the overall traffic. Often this traffic is originated by P2P applications that are originated and terminated at the end users. Therefore, no intermediate CSP can be charged for this traffic.

It is obvious that ISPs would like to limit the amount of traffic that is generated by the bandwidth hogs or, at least, to be able to offer them new pricing models that go beyond a best-effort flat rate for unlimited internet access. While we are not aware of such QoS tiered pricing on the user side in the United States, the British ISP Plusnet, for instance, already offers three distinct QoS classes to its customers, explaining, "With traffic management we can do lots of clever things to make sure everyone gets a good, fair online experience."⁸

However, the evidence for QoS tiering by ISPs on the end user side is currently very limited. Therefore, it is interesting to ask why ISPs lobby so intensely for the introduction of differentiated services on the CSP side, but still hesitate to offer differentiated service to the end users. One potential reason may be that ISPs are afraid of the end user reaction to such price discrimination. In particular, end users' perceptions of fairness seem to play a very important role in this context. In contrast to CSPs, the end users' perceptions of the fairness of pricing

⁶ B. van Schewick, *Towards an Economic Framework for Network Neutrality Regulation*, 5 J. TELECOMMUNICATIONS & HIGH TECHNOLOGY L. 329–391 (2007).

⁷ M. Dischinger, M. Marcon, S. Guha, K. P. Gummadi, R. Mahajan, & S. Saroiu, *Glasnost: Enabling End Users to Detect Traffic Differentiation*, PROCEEDINGS OF THE USENIX SYMPOSIUM ON NETWORKED SYSTEMS DESIGN AND IMPLEMENTATION (NSDI) pp. 1–14 (2010).

⁸ See http://www.plus.net/support/broadband/speed_guide/traffic_management.shtml. Last accessed on 11/03/12.

schemes is generally more prone to psychological and social influence factors.⁹ In fact, the NN debate shows in an impressive way to what size internet activists' complaints can grow. Therefore, this third threat of an abuse of market power can currently be considered negligible. Moreover, as long as users' access to the internet is not restricted against their will, there seems to be no case for jurisdiction.

III. DIFFERENT APPROACHES TO NET NEUTRALITY REGULATION IN THE UNITED STATES AND EUROPE

Since the NN concerns are driven mainly by the ISPs possible ability to exert market power, it seems logical that differences in NN regulations in the United States and Europe should also be driven by differences in market power between U.S. and European ISPs. These differences are predominantly seen in:

1. the extent of (infrastructure-based) competition between eyeball ISPs, and
2. the vertical integration between CSPs and ISPs.

As mentioned above, the competition between ISPs is arguably stronger in Europe. Moreover, European ISPs are not, or to a much lesser degree, vertically integrated with large CSPs. Therefore, European regulatory authorities see the issue of NN by and large less significant than the FCC.

In a nutshell, the FCC seeks to preserve the current status quo of how traffic is handled on the internet. This entails that reasonable network management practices are allowed, but also that any misconduct along the scenarios presented in the previous section is prohibited. More specifically, the FCC's framework¹⁰ rests on three general rules:

Rule 1: Transparency. ISPs shall provide accurate information about their network management practices as well as other technical information that is necessary for consumers to make informed choices when selecting their ISP.

Rule 2: No Blocking. ISPs are not allowed to block lawful content, applications, services, or non-harmful devices.¹¹

Rule 3: No Unreasonable Discrimination. Apart from reasonable network management, ISPs shall not unreasonably discriminate between different content and services in transmitting this network traffic to their consumers.

The first two rules seem rather uncontroversial and are similarly found in the EU Directive 2009/136/EC from November 25, 2009. However, the no-unreasonable-discrimination-rule is disputable and has no direct counterpart in EU law. It precludes ISPs, for example, from offering CSP tiering.¹² Many economists, including the authors, doubt that a strict *ex ante* ban of

⁹ L. Bolton, L. Warlop, & J. Alba, *Consumer Perceptions of Price (Un)Fairness*, 29 (4) J. CONSUMER RESEARCH 474–491 (2003).

¹⁰ FCC, *supra* note 5.

¹¹ With respect to this and also the subsequent rule, the framework makes a substantial distinction between fixed and wireless networks. In the form presented, the rules apply for fixed networks only.

¹² In fact, the FCC ruling just declares that it is “unlikely” that QoS tiering satisfies the no-unreasonable-discrimination rule and thereby effectively provides a loophole for future practice.

CSP tiering is justified. In particular, they point at the robust economic result that price discrimination is generally welfare enhancing and argue that misconduct could be dealt with *ex post*, e.g., by means of antitrust law. While the EU Directive 2009/136/EC has no principle objections against QoS tiering (on the user or CSP side), it already takes precaution with respect to the dirt road fallacy by allowing the national regulatory agencies to set an:

Alternative to Rule 3: Minimum quality of service requirement (Article 22, 3). In order to “prevent the degradation of service and the hindering or slowing down of traffic over networks,” ISPs shall provide a minimum quality of service.

Because the FCC’s rule 3 is stricter, such a minimum quality requirement is missing in the FCC’s regulatory framework. Beyond that, no specific NN law currently exists in any of the European Member States. Nevertheless, some Member States are active on this issue. In the Netherlands, for example, the majority of the parliament voted for a NN rule. More specifically, ISPs shall even be prevented from any network management practices. This approach follows the example of Chile, which was the first country in the world to adopt a strict NN law, and would go far beyond what is described in the European framework.

Moreover, in comparison to the European approach, the FCC’s framework is also somewhat inconsistent with respect to the element of competition. On the one hand, the FCC’s rule applies by and large only to fixed-line networks, because competition in the mobile networks is considered to be sufficient to warrant “the openness and freedom of the Internet.” On the other hand, transparency obligations are imposed on fixed-line network operators, which are only effective in the face of competition, i.e., if users can also act upon this information by choosing an alternative ISP.

As a matter of fact, the role of competition in ensuring NN is not clear at all. Empirical or theoretical evidence that competition would alleviate the concerns of NN proponents is currently not available. Wu,¹³ for example, analyzes the U.S. mobile phone market with respect to NN and finds many examples of non-neutral behavior—although this market is considered to be competitive. Similar observations hold for the European mobile markets, e.g., with respect to the previously mentioned VoIP option.

III. CONCLUSION

While there may exist differences in market power between U.S. and EU-based ISPs, it would be desirable if all the approaches to NN regulation, if warranted at all, were coherent—let alone for the simple fact that the internet is agnostic of national legal barriers.

¹³ T. Wu, *Wireless Carterfone*, 1 INT’L J. COMMUNICATION 389–426 (2007).