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Landmark EU and US Net Neutrality Decisions: How Might Pending Decisions Impact Internet Fragmentation?

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ABOUT THE GLOBAL COMMISSION ON INTERNET GOVERNANCE

The Global Commission on Internet Governance was established in January 2014 to articulate and advance a strategic vision for the future of Internet governance. The two-year project conducts and supports independent research on Internet-related dimensions of global public policy, culminating in an official commission report that will articulate concrete policy recommendations for the future of Internet governance. These recommendations will address concerns about the stability, interoperability, security and resilience of the Internet ecosystem.

Launched by two independent global think tanks, the Centre for International Governance Innovation (CIGI) and Chatham House, the Global Commission on Internet Governance will help educate the wider public on the most effective ways to promote Internet access, while simultaneously championing the principles of freedom of expression and the free flow of ideas over the Internet.

The Global Commission on Internet Governance will focus on four key themes:

- enhancing governance legitimacy — including regulatory approaches and standards;
- stimulating economic innovation and growth — including critical Internet resources, infrastructure and competition policy;
- ensuring human rights online — including establishing the principle of technological neutrality for human rights, privacy and free expression; and
- avoiding systemic risk — including establishing norms regarding state conduct, cybercrime cooperation and non-proliferation, confidence-building measures and disarmament issues.

The goal of the Global Commission on Internet Governance is two-fold. First, it will encourage globally inclusive public discussions on the future of Internet governance. Second, through its comprehensive policy-oriented report, and the subsequent promotion of this final report, the Global Commission on Internet Governance will communicate its findings with senior stakeholders at key Internet governance events.

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EXECUTIVE SUMMARY

During the past decade, net neutrality has become a central issue in the debate over further development of the Internet. At a time when the United States has just adopted a landmark regulation on net neutrality and the European Union is in the final stages of defining its own position on net neutrality, this paper looks ahead and analyzes the implications of these decisions with a particular focus on their impact on Internet fragmentation. The paper begins with an analysis of what is at stake in the net neutrality debate. The policy choice boils down to two competing technical models with very different commercial opportunities: a non-discriminatory infrastructure with innovation occurring at the edges, and an evolution toward "smart" networks that are permitted to develop new business models on the physical infrastructure, monetizing points of network congestion by selling pay-for-play quality of service to content and services providers. US regulators have taken a clear position that would ban any form of discrimination in the infrastructure for solely commercial reasons. The future of net neutrality in the European Union is more uncertain. It largely depends on the interpretation of the final text negotiated between the European Council, European Commission (EC) and European Parliament (EP) by national regulatory authorities. The paper identifies four possible areas for Internet fragmentation, if net neutrality rules in the United States and European Union significantly diverge. First, it could lead to a further divergence between the United States and the European Union regarding the competitiveness of their Internet industries. Second, it could increase barriers of market entry for new innovative start-ups in the European Union that seek to challenge Silicon Valley tech titans. Third, a weak net neutrality rule could lead to divergence of customer experience of the Internet. Fourth, discriminatory interconnection practices could be used to undermine the global Internet marketplace of information and services. The paper concludes with the thesis that the greater the difference between the implementation of the two net neutrality rules, the more likely the two markets will develop in significantly different ways.

INTRODUCTION: CENTRAL ISSUES IN THE NET NEUTRALITY DEBATE

Net neutrality is a central regulatory issue in the debate over the future development of the Internet. At stake is the distribution of control over the Internet as a platform of communications and commerce. In the past, the decentralized nature of the Internet was determined by the code of its technical architecture (van Schewick 2012). In the future, it will be a policy choice. Depending on how governments choose to regulate information networks, billions will shift around the Internet's enormous economic value chain. Moreover, control over the commercialization of the network is tied to both infrastructure development and power over what content and services are available to consumers. The political and economic implications of this decision are very broad and ripple out from national impact to international consequences. Net neutrality policies could either reduce or enhance the potential of fragmenting the global Internet marketplace. This is why a seemingly arcane technology policy issue has achieved such unlikely prominence in contemporary political debates.

This paper speaks to these "big picture" issues. But in order to understand what is at stake, it is important to begin with the basic technical questions of what the Internet looks like with and without net neutrality. The logic of the policy choices flows from the technical facts. From this perspective, the policy choice of net neutrality boils down to two competing technical architectures for information networks: a non-discriminatory infrastructure with innovation occurring at the edges and all content/service providers competing equally over the same networks; and an evolution toward "smart" networks that are permitted to develop new business models on the physical infrastructure that assert greater, centralized control over the content on their networks — monetizing points of network congestion by selling pay-for-play quality of service to content and services providers.[1]

In many ways, net neutrality regulations are not new laws. They codify the architectural "first principles" of the Internet — preserving in formal legal rules the technical features that enabled the Internet's tremendous growth. The Internet was originally designed according to the best effort, or "end-to-end," principle. This means that all data packets on the network are treated without discrimination and flow according to the best available path from origin to end point. These features were engineered into the Internet's basic technical protocols. The idea was to ensure that any new content, application or service could be designed with the same expectations of quality of service in routing traffic over the network (i.e., non-discrimination). The notion of discriminatory routing that would privilege certain senders of content over others was never seriously contemplated. Thus, during the early years of the Internet, technology for this type of selective gatekeeping was never deployed in the network (to the extent that it existed at all).

For most of the data paths on the global Internet at any given point in time, non-discrimination is a hypothetical non-issue because there is no congestion in the routers. Packets flow over the network at the speed of light and are routed from one network to the next in the order they arrive. The issue becomes meaningful at points of network interconnection that are congested — meaning there

1 The European Telecommunications Network Operators Association has lobbied for the application of the "sending party network pays" to content delivered over the Internet (McCullagh and Downes 2012).

is a line of packets waiting to get access to the physical infrastructure that will route the data to its final destination. Packets that wait too long are dropped. Significant levels of "packet loss" degrade the quality of the user experience. High levels of packet loss result in non-functionality for many Internet services.

The net neutrality debate is technically a choice about how to respond to congestion and packet loss. One solution is to increase capacity in the network to accommodate an increase in traffic flow. If bandwidth in the physical infrastructure increases, congestion reduces, and packet loss is no longer a problem. This is how net neutrality is tied to infrastructure expansion — abundant capacity eliminates the relevance of monetizing congestion because it is no longer prevalent. The opposite answer to constraints on infrastructure is to monetize the congestion by selling priority access — "paid prioritization" — offering paying customers the chance to skip the queue at congested routers. This model requires discriminating between content, applications or services that have paid for prioritization and those that have not. It is the favoured option of network owners and strongly opposed by most other stakeholders in the Internet community.

Network operators view the massive increase in the Internet's data flow, number of users and number of connected devices as evidence that the business of traffic management must change fundamentally. Today, more than three billion people use the Internet, an almost eightfold increase since 2000 (Internet World Stats 2015). The global network delivers huge amounts of traffic to and from these billions of users. One study estimates that by 2016, the Internet will carry one billion gigabytes of data in a single month (Cisco 2015a). Much of this data will be sensitive to traffic delays, especially when delivered to mobile devices. And an increasingly large percentage of the 15 billion online devices (growing to 25 billion by 2019) will be mobile (Cisco 2015b). This significant growth of mobile devices is partly due to the growing number of machine-to-machine applications, such as sensor networks, in smart city and smart factory projects.[2]

Based on these statistics, it is easy to see why the imperative of abundant bandwidth has focused attention on the net neutrality debate — which, at its core, is about how to respond to scarce capacity in the Internet. The central argument against net neutrality is that to accommodate the ever-increasing requirements for capacity on the network with sufficient profits for investment, it is necessary to create new revenue streams from pay-for-play priority on the Internet. By contrast, supporters of net neutrality argue that Internet use has always been growing rapidly and that the only way to protect innovation in competitive markets is to meet demand for bandwidth with more supply. In this way, the net neutrality debate centres on a choice between two economic models.

In recent years, market developments led by major network operators appeared to be leading toward more business models of paid prioritization. However, a business model based on the prioritization of data — a guaranteed quality of service for certain data streams — would violate the Internet's original principles. Consequently, advocates of net neutrality seek a regulatory framework to prohibit this practice by banning paid prioritization. Opponents believe that empowering network operators is a natural evolution of the technology. They argue that discrimination among packet streams is a pathway to innovative product development and efficient network management. Many network providers see the future of the Internet as a suite of differentiated "specialized services." Specialized services would offer a guaranteed quality of data transmission (i.e., paid prioritization at congested routers) for specific content, services or applications. Advocates of net neutrality worry that specialized services lead to a two-tier Internet: fast lanes for those who can afford them, and slow lanes for all those who are not willing or able to buy prioritized access to consumers. The result, they argue, would be the disruption of fair competition between all content and services, and a reduction in innovation and consumer demand.

In order to highlight relevant trends and important consequences of the net neutrality debate with respect to Internet fragmentation, this paper offers three focal points of analysis. The first is a summary and analysis of the recently adopted net neutrality rule in the United States. Because the Internet marketplace is further developed in the United States than in much of the world, Internet policy debates and decisions often happen in Washington first. Net neutrality is no exception. Many observers believe the US net neutrality rule will strongly influence how other nations shape their own regulatory frameworks (Ammori 2014; Sepulveda 2015). The second section takes up the EU debate over net neutrality — summarizing the recent history, current status and possible reactions to the US decision. In both sections, the analysis concerns the key issues in the net neutrality debate, including regulatory theory of market development, treatment of paid prioritization, treatment of specialized services and interconnection. The paper concludes with a discussion of potential consequences of divergent net neutrality decisions between the United States and the European Union and the possibility of global Internet fragmentation.

2 In a smart city or smart factory project, a variety of different sensors are used to better observe and analyze the environment. In a typical smart city project, parking spaces are equipped with sensors and transmitters to lead a car to the closest available space. In smart factory projects, similar cases lead to increased efficiency.

NET NEUTRALITY IN THE UNITED STATES

The United States has played a central role in the development of the Internet. The original architecture of the Internet and its underlying technical standards were shaped by US institutions. Most of the world's leading Internet companies are based in the United States. For these reasons, regulatory policy making in the US market has global implications. The rules shape the behaviour of American tech titans and govern access to the lucrative US market. Many countries around the world follow US policies in the technology sector. For an issue as important as net neutrality, the choices made in Washington are certain to have a broad impact in global markets (Scola 2014).

Net neutrality has been debated in Congress and before the Federal Communications Commission (FCC) for more than a decade. The term "net neutrality" dates back to 2003, coined by Columbia University law professor Tim Wu (Wu 2003). The history of net neutrality policy making in Washington has many twists and turns — guided by politics, statutory arcana, litigation, market development and public participation (almost four million individuals filed comments at the FCC in the latest public proceeding [Shields 2015]). Much has been written on the history of this debate (van Schewick 2007; Ammori 2013; Hazlett and Wright 2011) and it need not be revisited here. The conclusion of this history is what matters most — and that is the FCC vote on February 26, 2015 to adopt strong net neutrality rules (FCC 2015a). The full text of the rules — published on March 12, 2015 — represent the most specific and strict net neutrality rules ever issued by any regulator (FCC 2015b). The new rules apply to all providers of broadband Internet access services, including mobile. These are the key provisions:

- The order prohibits providers of Internet access service from blocking or throttling (or engaging in any other "unreasonable interference" to) lawful content, applications, services or devices (subject to reasonable network management) (ibid., paragraphs 111–37).
- The order prohibits providers of Internet access service from engaging in "paid prioritization" practices that offer preferential treatment on the network to specific traffic in exchange for money or other consideration (paragraphs 125–32).
- The order provides that all exemptions from the rules for "reasonable network management" must be suited to a technical purpose, not a commercial one, and enhanced transparency rules apply that require disclosure of network management practices to consumers (paragraphs 154–81, 214–24).
- The order extends the oversight of the regulator to include (for the first time) the points of interconnection between the Internet backbone and consumer Internet access providers. It does not apply the full net neutrality rules to these exchange points, but it does require exchange of traffic to be "just and reasonable" and applies a case-by-case approach to adjudicating complaints against this standard (paragraphs 194–206).
- The order provides an exemption from the rules for all services that are not broadband Internet access services (i.e., "specialized services"), but are offered over the same infrastructure — including, for example, Voice over Internet Protocol, cable TV and health monitoring. The distinction in the definition is that these services are limited in purpose, do not provide broader access to the Internet, and do not have the effect of circumventing the ban on paid prioritization (paragraphs 207–13).

The analysis that accompanies and justifies the rules adopts the logic of the original principles of non-discrimination built into the architecture of the Internet. The FCC rules clearly express that increased capacity, rather than monetized congestion, represents the best response to rising levels of traffic in response to consumer demand. The new rules are premised on a theory of market development the FCC calls the "virtuous cycle" (FCC 2015b, paragraphs 77, 102). Under this concept, new applications and services are developed by innovative businesses that require ever more bandwidth and quality of service. In response, more and more consumers are attracted to the broadband provider's Internet service to gain access to these new applications and services and buy connections at higher speeds. And these new revenues drive further investment in infrastructure to support the next generation of higher bandwidth applications. In this way, all participants in the value chain enjoy mutually beneficial growth in the marketplace and the public service goals of building a robust information infrastructure and achieving higher levels of technology adoption are met.

The FCC's net neutrality rules seek to set the market incentives for all participants in the Internet marketplace to play their roles in the virtuous cycle. But the regulator concludes that without clear net neutrality rules, broadband network owners have a clear incentive to discriminate (ibid., paragraph 79), irrespective of whether they have market power over competitive service providers (paragraph 84). Each network operator has a monopoly over its own subscribers, and only rules requiring an open market will guarantee the persistence of the virtuous cycle. The explicit prohibition on blocking, throttling, paid prioritization or any other form of discrimination is intended to protect the most beneficial market structure.

Notably, the FCC's rules look beyond the problem of paid prioritization within the so-called "last mile" of the broadband Internet access provider's network. The rule considers the possibility (citing examples of market abuses) that discrimination will begin to appear at the points of interconnection between local Internet access providers and the backbone of the Internet (paragraphs 194–206). This is a new development in the net neutrality debate, and it follows from recent market disputes between major content providers and network operators. For example, in 2013 and 2014, a dispute between Netflix and the six largest Internet Service Providers (ISPs) in the United States resulted in broadband speeds for all traffic delivered over the Cogent backbone network (approximately 10 percent of Internet addresses) dropping below one megabit per second and disrupting the functionality of many services (including streaming video) in tens of millions of households for nine months (MLAB 2014; Brodkin 2015; Crawford 2014; Higginbotham 2014). This discriminatory traffic management was not a result of paid prioritization within the local access network. It was caused by congestion at the point of interconnection between a backbone provider (in this case Cogent, carrying traffic from Netflix, among many others) and the local access networks of cable and telecommunications companies.

The exchange of traffic between network operators occurs under the terms of interconnection agreements — privately negotiated contractual arrangements that are usually confidential and completely unregulated. Historically, the cost of moving traffic across the Internet was divided between interested parties. Content companies and backbone providers paid the costs of taking traffic from data centres to the nearest point of interconnection with the ISP (telecommunications or cable company) of the consumer requesting the content. And the local access network bore the costs of delivering the traffic down the last mile to the consumer. Typically, the exchange of Internet traffic between networks is handled under "settlement-free" terms — meaning no money is exchanged, as each side benefits from the relationship.

Changes in the marketplace of content delivery and mergers among consumer ISPs have begun to alter incentives. Two major trends are particularly relevant here. First, the ratio of the exchange of traffic between the "upstream" transit network (bringing content to and from data centres) and the "downstream" ISP network (bringing content to and from end-users) has changed substantially. The era of mass-market video streaming services has resulted in higher ratios of content headed downstream than upstream. And although these streaming video services are also driving consumer demand for higher speed and more expensive access subscriptions, the changes in interconnection ratios have caused many ISPs to reconsider settlement free peering. The second major trend is the consolidation among access ISPs in the US market. The five largest cable and telephone companies now control over 75 percent of the high-speed Internet subscriptions in the US market (Leichtman Research Group 2015). The scale of access network consolidation combined with their concerns over interconnection data ratios opened the door for an ISP to contest an interconnection agreement — betting that no content company would risk losing access to a large group of customers.

In the case of the so-called "Netflix dispute," six major network operators refused to honour a settlement-free interconnection agreement with Cogent because they argued Netflix, which utilized the Cogent backbone to interconnect with ISPs, was pushing so much data to their customers that extra payments were in order. Indeed, by some estimates, Netflix accounts for as much as 35 percent of all Internet traffic in the United States during peak usage hours (Statista 2015). Netflix and Cogent refused to pay fees beyond the reasonable costs of upgrading network capacity at exchange points. And so the ISPs refused to increase the capacity of the interconnection ports to accommodate increases in traffic flows. The result was major congestion at the interconnection points to these ISPs for all Cogent-delivered traffic. Both sides of the business dispute dug in their heels for nine months and consumers, kept in the dark about why their Internet connections slowed to a trickle, suffered the consequences. Reluctantly, Netflix ultimately relented and now pays for access (the rate of payment was never disclosed) (Ramachandran 2014).

The incident raised the attention of regulators. This was not a conventional net neutrality violation of paid prioritization through congested routers in the last mile of the local network. The Netflix dispute did not involve prioritization at all. The interconnection ports were simply not upgraded to meet the capacity demands of inbound traffic. This dispute offered regulators evidence for how intentional congestion and subsequent degradation at the interconnection point (in order to coerce greater payments) can harm consumer interests (Brodkin 2015) without any paid prioritization. As a direct result, the FCC has declared its intention to monitor these interconnection points and respond to complaints that traffic exchange is not handled in a just and reasonable manner (FCC 2015b, paragraph 205).

The facts of this interconnection debate and the regulatory response of the FCC have broad implications at the international level. In the case of the Netflix dispute, the core interest was large ISPs seeking a greater share of revenues from a successful content provider in exchange for access to subscribers. This is a very different practice than the conventionally debated question of paid prioritization through congested links — although it belongs in the same category of clashes between network operators and over-the-top (OTT) providers that result in consumer harm. However, the intentional creation of artificial congestion at points of interconnection in order to extract additional

payments could become a practice informed by national interests — including economic protectionism, political censorship or anti-competitive practices. Consider a scenario in which the point of interconnection is an international gateway that is a high-volume path for foreign sources of traffic to reach consumers in any given country. Any government or network operator that exerts control over that interconnection point could congest the exchange of traffic with any particular backbone provider delivering any particular content such that content and services never reach consumers in functional form. The implications of this problem are not yet fully understood and involve a rapidly shifting marketplace of network operators that move traffic across the backbone of the Internet. It will be an issue for national regulators and international policy makers to monitor carefully, irrespective of how they treat paid prioritization or specialized services.

Consumer advocates, public interest groups and large parts of the technology and media sectors have welcomed the new net neutrality rules adopted by the FCC. There is also very strong criticism. The focus of criticism is on the FCC's decision to implement the new rules under a legal authority classifying broadband Internet access service as a public utility. For example, the National Cable & Telecommunications Association (NCTA) warns that this approach constitutes a "massive regulatory regime" that undermines innovations and investments by the telecommunications industry (NCTA 2015).[3] The critique of the regulatory approach is grounded in the arguments that the new rules impose expensive new obligations and prohibit new revenue streams that would enable expanded investment in infrastructure (Wakefield 2015). The rule is expected to be challenged in the courts by the major network owners (Puzzanghera 2015).

NET NEUTRALITY IN THE EUROPEAN UNION

The future of net neutrality rules in the European Union is more complicated and the eventual outcome of the debate is still uncertain. Even after Brussels reaches a conclusion to the negotiations over a net neutrality policy this year, the significant ambiguities of scope and definition will be interpreted by all of the member states. The differences between net neutrality in the European Union and the United States go beyond the problem of disparate national implementation. There are significant differences in the market structure in Europe in two important ways. First, there is considerably more competition between consumer ISPs. This raises the possibility that incentives to violate net neutrality will be reduced by the threat of consumers switching ISPs, assuming at least one chooses not to engage in revenue-enhancing discrimination and switching costs are not a serious obstacle. Second, and more importantly, the largest and wealthiest content and services companies that might pay extra fees in a non-neutral Internet are mostly non-European companies (the digital market for OTT products in Europe is underdeveloped.) This brings a political orientation to the debate that is more about regional economic self-interest than it is about good technology policy.

The impending settlement in Brussels will be applied in an already crowded field of policy debate at the national level across the European Union. Some member states, such as Slovenia and the Netherlands, have already adopted laws to protect net neutrality — declining to wait for supranational regulation (Meyer 2015). Meanwhile, net neutrality is hotly debated in other member states either as a stand-alone issue or in response to debates on the EU level. Arguably, net neutrality practices have support from existing national telecommunications laws in some member states. But as long as the EU is poised to set net neutrality policy for the regional bloc as part of its single digital market initiative, the ultimate outcome for Europe remains open. If the EU finalizes new policy this year (as seems likely), a new chapter in the EU's history of net neutrality will begin as member states begin to interpret the law through national regulators and apply it amid the specific conditions of particular markets.

A short history of this debate in the EU offers useful insights as to where it may end up. The EC initiated formal discussions on net neutrality as early as 2006. In 2009, the EU telecom reform legislation recognized Internet access as a fundamental right, such as the freedom of expression and the freedom to access information (Official Journal of the European Union 2009). The annex of the directive contains a declaration by the EC including the commitment to preserve "an open and neutral Internet" (ibid., L337/69). This declaration should be understood as a political expression, highlighting the importance of net neutrality (March 2011). It did not have any legally binding effect on the member states. However, it put net neutrality on the agenda of European telecommunication regulators and lawmakers. While the 2009 reform package included references to net neutrality, it left the mandate to promote an open and free Internet to member states. At the same time, the EU recognized the need for coordination and supervision, creating the Board of European Regulators for Electronic Communications (BEREC).

BEREC launched consultations on net neutrality and published its own report on best practices and recommended approaches in October 2011 (BEREC 2011). While the report refrains from engaging the debate on how to define net neutrality head on, it cites Tim Wu's definition of net neutrality as a network design principle that a "maximally useful public information network aspires to treat all content, sites and platforms equally"

3 The question of statutory authority is critical to the legal standing of the FCC's rules, but its relevance is separate from the substance of the rules and therefore not of central importance to the international debate.

(Wu n.d.). Referencing Wu, the report proposes a "literal" working definition for net neutrality as the principle that "all electronic communication passing through a network is treated equally" (BEREC 2011, 7). The main focus of the report discusses guidelines for national regulators on how transparency policies regarding net neutrality can enable consumers to make informed decisions regarding the choice of their ISP. BEREC also conducted consultations on quality of service in the scope of net neutrality and competition issues in the context of net neutrality (BEREC 2012a). Notably, BEREC also explored the potential net neutrality implications of interconnection disputes in a 2012 report (BEREC 2012b). The report found that net neutrality concerns were limited to the last mile network of ISPs, and interconnection agreements would not be implicated.

In 2013, then Commissioner for the Digital Agenda Neelie Kroes made net neutrality a part of her package on creating a single European telecommunications market. After years of debate in which the pendulum appeared to swing back and forth between supporters and opponents, the final proposal from the EC — published as a part of the "Telecoms Single Market: Regulation" — seemed to favour the opponents of net neutrality (EC 2013). Although the proposal supported an open Internet and banned blocking lawful content, net neutrality advocates criticized the imprecise language of the text and the many potential loopholes it would leave for discrimination (Ermert 2013). The EC's provisions adopted the spirit of the FCC's open Internet rules, but critics noted that the proposal made it possible for ISPs to charge for or discriminate between Internet services without any objective justification (Horten 2013). The proposal did not include a provision on the general protection of the principles of net neutrality, and thus would have allowed "specialized services" without significant restrictions against using specialized services to circumvent the net neutrality rule governing Internet access service.

In April 2014, the EP began its first reading of the Telecoms Single Market proposal. After much debate and many amendments (Masse 2014), the EP voted to strengthen the protection of net neutrality principles (EP 2014). At the core of the legislation were specific restrictions on specialized services and a clear definition of net neutrality very similar to the ones proposed by Wu and BEREC: "'net neutrality' means the principle according to which all internet traffic is treated equally, without discrimination, restriction or interference, independently of its sender, recipient, type, content, device, service or application" (ibid., article 2, paragraph 2, point 12a).

The strong net neutrality legislation passed by the EP stands in contrast to the commission's initial proposal, setting up a difficult negotiation between the branches of European government. Taking up both the EC and the EP texts on net neutrality, the Council of the European Union began deliberations on a position on net neutrality in late 2014. The council adopted its final position on the Telecoms Single Market regulation in March 2015 — almost a year after the EP vote (Council of the European Union 2015a). The European Council's text reintroduced "quality of service" differentiations into the regulation without specific restrictions on how specialized services would be prevented from weakening the overall rule. In the view of critics, the council's language risked undermining a core principle of net neutrality (McNamee 2015): "End-users, including providers of content, applications and services should therefore remain free to conclude agreements with providers of electronic communications to the public, which require specific levels of quality of service" (Council of the European Union 2015a).

Unsurprisingly, civil society reacted strongly in opposition to the joint proposal (Access 2015). And in the wake of the FCC's new rules, the European Council's position did appear weak in comparison. It does not adopt the logic of the FCC's "virtuous cycle" and opens the door to paid prioritization and specialized services, provided that they do not interfere with basic Internet services (Thomas, Crow and Robinson 2015). A series of negotiating rounds ensued in the spring and early summer of 2015 between the EC, the European Council and the EP. A final deal on a net neutrality text — heralded as a breakthrough by EC leaders (Bernau 2015) — was concluded in late June in a marathon negotiating session.

The near-final text of the agreement (at the time of this publication) appears to mirror many of the main provisions in the FCC rule — suggesting that the exhaustive analysis in the FCC decision may have had some influence on EU deliberation. Without question, the final settlement is considerably stronger than the proposals of either the EC or the council in the negotiations. The EU text includes a broad non-discrimination rule protecting all lawful content, applications and services on the Internet from blocking, throttling or other forms of discrimination. Paid prioritization is taken off the table. Reasonable network management is permitted, with relatively wide latitude, provided it is undertaken for technical and not commercial purposes. The provisions on "specialized services" — the text now adopting a definition akin to the FCC's, describing them as electronic communications services that are not Internet access services — remain the source of ambiguity. The provision has been substantially strengthened compared to earlier texts from the EC and the council — explicitly providing that these non-Internet access services may not be used to circumvent the net neutrality rule governing the Internet. However, the rule leaves the national regulators to interpret two key definitions: whether the enhanced quality of service requirements are "necessary" to provide the service; and whether there remains "sufficient" bandwidth in the

network to allow for Internet access service. The text reads as follows (Council of the European Union 2015b):

> Providers of electronic communications to the public, including providers of internet access services, and providers of content, applications and services should therefore be free to offer services which are not internet access services and which are optimised for specific content, applications or services, or a combination thereof, where the optimisation is *necessary* in order to meet the requirements of the content, applications or services for a specific level of quality. The national regulatory authority should verify whether and to what extent such optimisation is objectively *necessary* to ensure one or more specific and key features of the content, application or service and to enable a corresponding quality assurance to be given to end-users, rather than simply granting general priority over comparable content, applications or services available via the internet access service and thereby circumventing the provisions regarding traffic management applicable to the internet access service. (paragraph 11, emphasis added to highlight key phrases)
>
> In order to avoid a negative impact of the provision of such services on the availability or general quality of end-users' internet access services, *sufficient* capacity needs to be ensured. Providers of electronic communications to the public, including providers of internet access services, should, therefore, offer such other services, or conclude corresponding agreements with providers of content, services or applications facilitating such services, only if the network capacity is *sufficient* to provide them in addition to any internet access services provided. (paragraph 11a, emphasis added to highlight key phrases)

In the end, the core questions in the European debate are similar to the central challenges in the FCC's new net neutrality rules. The difference is that the key issues will be adjudicated in 28 member states and important interpretation left up to national regulators. These separate threads may all tie back to a common outcome similar to what happens in the American market — or they may result in considerable divergence from one another and from the US regulatory praxis. Time will tell.

THREAT OF INTERNET FRAGMENTATION

Despite the convergence of approaches on net neutrality between the United States and the European Union, there remains a significant chance that we will see some degree of divergence between how the rule is interpreted in Europe versus the United States. The political landscape in the EU is quite different than in the US. The vibrant community of technology companies that counterbalance the telecommunications industry in the US is a much weaker political force in the EU. Moreover, many opponents of net neutrality argue that empowering EU telecommunications operators is a method of undermining the market strength of America's tech titans in Europe (*der Standard* 2013). Given the strong voices for market liberalism within the EC and the fractious views among member states, there is a reasonable chance that net neutrality in practice in the EU will be weaker than in the US. Hence, it is worth contemplating the potential results.

Will a US/EU split on net neutrality lead to digital market fragmentation? The answer is not straightforward. Given the similarities in the rules, it is unlikely that there will be dramatic consequences that quickly reach all corners of the Internet economy. If there is divergence, the most significant consequences will be within the EU digital economy and in the relationship between EU and US technology companies. Some of these changes could be characterized as fragmentation at the regional level.

The full implications of technical or market balkanization would only be clear after many years. It is difficult to predict exactly how these changes might play out under real world market forces. However, in four broad areas, there is a potential case for fragmentation that we can analyze in possible scenarios. Developments in these areas should be monitored closely. The first two cases will directly shape markets in Europe (regional fragmentation). The third and fourth cases track market power asymmetry and fragmentation that could spill over beyond the United States and the European Union into the global market.

First, if the EU allows pay-for-play business models on the Internet (for example, through a loose interpretation of the restrictions on specialized service offerings), it is very likely to strengthen the position of the incumbent telecommunications companies at the expense of the nascent European Internet industry. This result would exacerbate the comparative weakness of European technology companies compared to their global competitors. The structure of the EU market is already, by its nature, distributed among different languages, consumer cultures and national regulatory policies. A model of paid quality of service would establish market conditions in which it would be necessary for content and service providers to navigate these divisions and to

negotiate separate business deals for quality of service across member states with dozens of network operators. Further, the monetization of congestion by local incumbent network operators could reduce incentives for expanding broadband capacity. If there is a lucrative business selling priority access to congested routers, the prospects of network operators eliminating that business by expanding capacity with an expensive fibre optic build-out will be questionable. Stagnation in network expansion would further depress outputs among innovative content and service providers, and, in turn, consumer demand would not increase. This is the inverse of the FCC's virtuous cycle and the outcome the US regulator seeks to avoid by promulgating net neutrality rules.

Following the logic in such a scenario, the European Union's top line goals on technology policy would be fractured by internal contradictions. On the one hand, Brussels appears sympathetic with incumbent telecommunications network owners who seek deregulation, permission to consolidate and authorization to provide services that may undermine net neutrality. On the other hand, EU policy makers have demanded extensive expansion of network infrastructure, including higher speeds and wider availability (EC 2015). Further, Europe is very committed to growing its own Silicon Valley and cultivating an entrepreneurial ecosystem of innovators that create new business, win global market share and generate consumer demand for Europe's online products. According to the FCC's regulatory theory of the virtuous cycle, these goals are not compatible.

The FCC's logic is that the basic assumption that drove innovation on the Internet from its inception was the expectation of non-discrimination and equal access to the digital market. This innovation in content, applications and service drove demand for ISP subscriptions and triggered further expansion of infrastructure to meet consumer expectations. This virtuous cycle was a practical reality until the early 2000s, based on limited technical capabilities to engage in discriminatory routing as well as regulatory restrictions. After deregulation in 2002, the law permitted (in theory) violations of non-discrimination, but a series of FCC decisions — including statements of principles and merger conditions, as well as a political debate over net neutrality with uncertain outcome — created an overhang of regulatory risk for any business model premised on pay-for-play. This effectively held the status quo of non-discrimination in place until the FCC's formal rules were enacted.

The US net neutrality rule spends several thousand words explaining why regulatory practice cannot support both the maximization of OTT innovation and permit discriminatory pricing by network operators. The decision rejects the competing regulatory theory that innovation within the network holds promises for invention and investment that outweigh the risk of impeding innovation in OTT services. Perhaps the Americans are incorrect. However, if Europe attempts the path the FCC says is fraught with contradiction and Washington is proved correct, this scenario would be a disaster for the European Union. Europe's policy agenda for achieving competitive parity with the United States in digital markets would instead lead counterproductively to an even greater imbalance in shares of the Internet value chain. This form of regional fragmentation would come in the form of an extended recession in European technology market share and enhanced dominance by US technology companies.

Second, a related scenario of fragmentation looks at the disadvantage to European content and services companies from another angle. Not only will European companies lose out from weakened incentives for robust infrastructure and high barriers to enter pay-for-play delivery markets, these trends will favour American companies with existing market power. The immediate pressure of current market forces in a pay-for-play digital market that includes a host of specialized services, forecasts an outcome that is highly unlikely to reverse the trend of monopolization in major market segments. The opponents of net neutrality in Brussels often make the case (explicitly or implicitly) that empowering European network owners to charge for quality of service will take Silicon Valley giants down a peg (*der Standard* 2013). On the contrary, a market that permits monetizing congestion is more likely to lock in the monopoly market shares of the current group of Internet mega-brands. In a market that requires large sums of liquid capital to buy prioritized treatment (and armies of lawyers to negotiate separate deals with dozens of network operators), the largest players in today's market will have an enormous advantage.[4] And the incentives for today's monopolists will be to raise the barriers for entry to the fast lane in order to further distance themselves from any potential competitors. The winners in this new market will be EU telecoms and American content and service providers — in other words, reinforcing current market power in adjacent sectors rather than creating conditions for competitive innovation in either (Fitchard 2014).

This thesis is supported by the conspicuous silence of many of Silicon Valley's largest and most valuable companies in the FCC's recent debate over net neutrality (Newmyer 2015). They did not actively support or oppose the rules because they win either way. Therefore, it follows in the European debate that opponents of net neutrality are correct that a pay-for-play business will extract revenue from American tech giants that will flow to network

4 These companies already enjoy a significant advantage that comes from enormous resource disparities. Many have built global content delivery networks that move cached stores of popular services and websites physically closer to their customers. This physical proximity increases download speeds relative to other services stored farther away. Paid quality of service would add a qualitatively new dimension to this existing advantage.

owners. However, it also follows that this will lock in their monopolies at the expense of potential European competitors.

Third, a divergence in net neutrality rules and subsequent shifts in market trends could lead to further fragmentation scenarios that alter user experience of the Internet due to economic discrimination. If telecommunication providers can offer fast lanes for certain content or applications for those willing to pay, many content and service providers may opt to avoid offering products in markets where these fees are not justified by the potential revenues from a local customer base. Very large national markets will not have this problem because the sheer size of revenue opportunities will outweigh any potential discrimination. But mid-size and small markets will not have this luxury. Over time, this could result in an additional layer of fragmentation for the user (Leva, Hammainen and Kilkki 2009). Certain content, services and applications will not be offered to populations that do not justify the expense, and the grand ideal of a global information commons accessible to everyone will fade. In short, the Internet will no longer be the Internet we know today, because depending on the country or ISP of the Internet user, the availability of content and the experience with certain applications will be profoundly different. This type of fragmentation would significantly extend existing practices that fracture the Internet, including outright content censorship and uneven distribution rights for copyrighted content (MacKinnon et al. 2014). The recent developments in so-called "zero-rating" (offering access to Internet content that is not charged against a data subscription) foreshadow this trend. In some places, services are marketed as "Internet access" despite the fact that they offer only a few dozen websites (Bhaskar 2015).

Fourth, the possibility of widespread discrimination at points of interconnection holds the most potential for a fragmented Internet scenario, and yet its implications have not been fully explored by analysts and regulators. The FCC's inclusion of interconnection and traffic exchange as a part of the net neutrality rules marks a rare consideration of interconnection agreements in the net neutrality debate. The reason interconnection policy issues have been underdeveloped is likely due to the complexity and opacity of the market. There are hundreds of network providers with international transport networks. And almost all of the agreements that govern traffic exchange are confidential. Conventional wisdom is that a very large share of Internet traffic is exchanged through a settlement-free or "bill and keep" peering arrangement that involves no payments. This is a highly efficient system[5] — it operates across borders and has no obvious regulatory jurisdiction; and because disruptions have been infrequent, regulators have usually been content to ignore it (BEREC 2012b, 61). However, consolidation in the ISP market and the rise of data-intensive online video services have begun to change market dynamics (see, for example, the earlier description of the Netflix dispute).

The Netflix dispute from 2013-2014 resulted in the most serious consumer harm to date from an interconnection dispute, but it is not unprecedented. In 2005, two large backbone providers (Level 3 and Cogent) had a dispute over traffic exchange in the United States that blacked out chunks of the Internet for many customers for a few days (Cowley 2005). In 2013, the EC's directorate-general for competition conducted unannounced inspections at the premises of Deutsche Telekom, Orange and Telefónica to investigate potential abuses of breaking traffic exchange agreements (Godfroid and Hautbourg 2015). The directorate-general feared that these companies would abuse their dominant position by throttling and degrading traffic from third-party networks. These suspicions were, among other things, based on the facts observed in a dispute between Orange and Cogent (Genna 2013).

Following the logic of these disputes, a national government or a major ISP could choose to make policy requiring payments for interconnection at international gateways, or simply for any access to local ISPs. Breaking a settlement-free peering agreement in favour of paid contracts for data exchange is not necessarily unreasonable or unjust. However, the potential for abuse is significant (Florance 2015). If the prices for interconnection are unregulated, not transparent, and not related to the actual costs of carrying traffic, the incentive to gouge other service providers will be clear and lucrative. These kinds of policies could easily take on the political purpose of economic protectionism or content censorship. And discrimination at the interconnection point does not require sophisticated technology or complex business agreements like paid prioritization does. Discriminatory interconnection is relatively simple to implement. If one country does it, it will distort the global market, but it will not break it. If many countries do this, it will yield a tragedy of the commons whereby the global market of information exchange breaks down and the Internet is fragmented into a complex of walled gardens.

5 Indeed, it is so efficient that in the US market, major telecommunications network operators are arguing that the old system of "inter-carrier compensation" for telephone calls (a per minute fee for access and termination among networks) be phased down to a zero price that mirrors the settlement-free interconnection of the Internet. Ironically, they argue the opposite for interconnection on the Internet where their economic interests are differently situated.

CONCLUSION

The net neutrality debate is much more than an arcane technology policy decision for communications regulators. The choices that nations make will determine not only the architecture and market structure of their own information systems (including mass media, digital commerce and personal communications), it will also determine whether the global Internet will remain an information commons or fracture into a set of national or regional political economies. For years, the United States and the European Union have discussed, studied and debated the issues involved in net neutrality. The United States began the process a decade ago with very weak intentions to protect net neutrality — but ended this year with a very strong net neutrality rule. The European Union began the process with strong intentions to protect net neutrality. After periods of debate that moved away from this standard, EU policy makers have concluded with a rule similar to the United States, but with some lingering ambiguity that may yet result in scenarios of divergence.

The implications for the transatlantic digital marketplace are significant and could lead to different forms of regional fragmentation. Predominantly, this divergence will turn on whether the FCC's regulatory theory is correct. The Americans argue that net neutrality is the catalyst for ensuring market incentives produce the best possible outcomes. The FCC's theory of the virtuous cycle is to drive innovation in content, applications and services that in turn increase consumer demand for broadband access and push revenues to network operators for further investment in infrastructure. Consequently, the US market will prohibit business models that monetize congestion. By contrast, European regulators at the national level may interpret the new rule from Brussels as permissive for network operators to create discriminatory service offering. The rationale may be in part to create in its telecommunications sector an economic counterweight to Silicon Valley. The greater the difference between the implementation of the two net neutrality rules, the more likely the two markets will develop in significantly different ways. Once these choices are made, they will be difficult to reverse.

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