

The Network Neutrality Debate and Development

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The Internet, often referred to as a seamless web and a world without borders, is, in fact, not as homogeneous as the concept of a global network may suggest. From social and linguistic clustering, through political filtering and content control, geo-location software and legal jurisdiction, and, finally, to alternative domain-name systems and non-Roman alphabet domain names, the Internet often looks quite different to different people. While it is difficult to evaluate the long-term consequences of these trends, some might have a negative effect on users' experience and the future development of the Internet. This study focuses on one such potentially troublesome area, namely, the Net Neutrality controversy.

In the most general meaning of the term, Net Neutrality questions the right of ISPs and other network operators to deliver certain data packets faster than others based on the type of application, source and nature of content, and other criteria. Yet, as with many other things, "the devil is in the details." Therefore, the issue of definition is of critical importance and will be given due attention in this paper.

An absolutely neutral or "dumb" network is not technically feasible, especially in such a complicated system as the Internet. The task of ensuring data exchange on a global scale and especially attempts to improve quality of service have forced Internet engineers to introduce intelligence into the network in form of "smart" routers and gateways. However, as the Internet begins to play an ever-increasing role in the economy and, as technical capabilities of identifying certain packets and treating them differently grow, new criteria for discriminating against certain types of traffic are suggested. In the long-run, some of these new developments may have a strongly negative effect on the evolution of the Internet and on the end-user experience, especially in developing countries.

The Net Neutrality debate has recently come to the forefront of Internet governance discussions in the United States. As with any Internet-related discussion in the US, this one may have considerable global consequence. As will be discussed further, decisions with regard to Net Neutrality made today can have long-term effects on the evolution and use of the Internet at large. Hence, these decisions clearly fall within the scope of Internet governance as defined by the Working Group on Internet Governance (WGIG, 2005): "the development and application by Governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programmes that shape the evolution and use of the Internet."

Further, the issue of Net Neutrality is of direct relevance to the mandate of the Internet Governance Forum/World Summit on the Information Society (IGF/WSIS) and the content of other debates held at the international level, as the issue is relevant to the broader area of "Openness/Access to Information." Openness, associated with the free and unbiased flow of information and knowledge, is a "founding principle and characteristic of the Internet" according to the Agenda for the Athens meeting of the IGF (NTRA, 2006). Inasmuch as the possible segmentation or stratification of the Internet may affect the ability of Internet users freely to seek, receive, and exchange information, these issues fall within the scope of the Openness theme.

The IGF also has a clear mandate to attend to issues that affect the sustainability, development, and equitable distribution of Internet resources as described in WSIS documents (WSIS, 2005a). Among other things, this involves the "development of strategies for increasing affordable global connectivity, thereby facilitating improved and equitable access for all," including pricing schemes for interconnection costs "oriented towards objective, transparent and non-discriminatory parameters" (WSIS, 2005b). In addition, the outcome of the Net Neutrality debate can affect the pattern of innovation, competition, and investment in the provision of Internet access. Promoting an enabling environment in these areas is clearly indicated as one of the international community's goals in the field of Internet governance (WSIS, 2005c). The issues of Net Neutrality are thus

clearly within the mandate of the leading international institutions involved in the Internet governance process.

The Net Neutrality debate is particularly important for developing countries, for several reasons.

- Rising or prohibitive costs of Internet access, caused by a multi-tiered Internet, could slow the implementation of universal access. The first, current priority for developing countries must be improving access for all citizens, in the hope that it will improve information flow and educational opportunities, as well as innovative applications for business, employment, and sources of income. This will have a multiplying effect that will eventually support health, and all of the UN Millennium Development Goals, with the ultimate effect of bridging the digital divide.
- The probability of subtle manipulation of unseen technical factors such as speed can affect information flow, prioritizing some information over others, in hidden, almost subliminal layers. This is particularly important in countries already faced with fragile democracies or limited access to objective information, whether through outright censorship or more subtle threats to open journalism and websites.
- Voice over Internet Protocol (VoIP) and other innovative applications offering new technologies at accessible costs have immediate applications for improving services that will directly help bridge the digital divide as they improve communications. The establishment of such services in developing countries can be severely limited if Net Neutrality is not explicitly protected in these countries and around the world.

The importance of the issues of access, transparency, and innovation for developing countries makes addressing the issue of Net Neutrality of primary concern. This is an opportunity to work towards diminishing the digital divide and supporting the UN Millennium Development Goals.

In sum, many questions regarding Net Neutrality require formulation and response. If Net Neutrality deserves protection, the question is how? Should a political or legal solution be enacted at national or international levels? Can we trust an informal free-market solution that may develop on its own, or should legal and political means be used to enunciate this principle? Will market forces ensure the best outcome, whatever this may be? These are some of the questions to be addressed.

We hope that this report will help further the discussion of these important issues and, ultimately, decision-making with regard to them. We will analyze the issues of Net Neutrality with a particular focus on developing countries, and propose further steps to protect their interests. In order to achieve this goal, we address a number of points:

- various approaches to understanding and defining Net Neutrality
- the nature of the Net Neutrality debate, the main actors involved, and their positions and arguments
- likely scenarios for developing countries associated with the probable outcomes of the Net Neutrality debate
- steps that may protect the interests of developing countries in regard to Net Neutrality.

Net Neutrality: Definitions

One of the origins of the controversy over the principle of Net Neutrality lies in different meanings assigned to this concept. Quite often, the definitions of “Net Neutrality” are rather vague and allow for multiple interpretations, such as that proposed by the NGO Common Cause (2006): “Network Neutrality is the principle that Internet users should be able to access any web content they choose and use any applications they choose, without restrictions or limitations imposed by their Internet service provider.” Eli Noam (2006), in a *Financial Times* article, outlines at least seven related, but different meanings associated with the concept:

- “No different quality grades (‘fast lanes’) for Internet service”
- “No price discrimination among Internet providers”
- “No monopoly price charged to content and applications providers”
- “Nothing charged to the providers for transmitting their content”
- “No discrimination on content providers who compete with the carriers’ own content”
- “No selectivity by the carriers over content they transmit”
- “No blocking of the access of users to some websites.”

Among these various interpretations, the most extreme understanding entails that a neutral network transports data packets without prioritizing any of them, not even on basis of the type of application to which they belong. Although this strict definition may appeal to Net Neutrality purists, it renders the network inoperable, since some types of data, such as error messages and some router-to-router traffic, have to move faster than the rest of the packets in order to diagnose network faults in the case of network congestion.

It is interesting to note that some scholars, such as Columbia University law professor Tim Wu (2003), see the non-discrimination of packets based on type of application as evidence of the Internet’s non-neutrality. The completely “dumb” network is not neutral, they claim, as it ignores the needs of a particular application and, hence, effectively discriminates against “latency-sensitive” applications—that is, those such as streaming video and audio that operate in real time and, thus, cannot tolerate even short delays in data packet delivery. In Wu’s understanding, Net Neutrality means equal treatment among similar applications, rather than neutral transmissions regardless of applications. According to Wu (2003),

“Neutrality, as a concept, is finicky, and depends entirely on what set of subjects you choose to be neutral among.... This problem afflicts the network neutrality embodied in the IP protocols. As the universe of applications has grown, the original conception of IP neutrality has dated: for IP was only neutral among data applications. Internet networks tend to favor, as a class, applications insensitive to latency (delay) or jitter (signal distortion). Consider that it doesn’t matter whether an email arrives now or a few milliseconds later. But it certainly matters for applications that want to carry voice or video. In a universe of applications, that includes both latency-sensitive and insensitive applications, it is difficult to regard the IP suite as truly neutral as among all applications. (p. 149)”

Attempts to identify the significant components or provisions of the Net Neutrality principle are seldom more effective in accurately describing the concept.

Another well-known endeavour to describe Net Neutrality is the list of “four freedoms” promulgated by Chairman of the US Federal Communications Commission, Kevin Martin.

1. “Consumers are entitled to access the lawful Internet content of their choice.”
2. “Consumers are entitled to run applications and services of their choice, subject to the needs of law enforcement.”
3. “Consumers are entitled to connect their choice of legal devices that do not harm the network.”
4. “Consumers are entitled to competition among network providers, application and service providers, and content providers.” (FCC, 2005a)

Despite the seemingly indisputable nature of these principles, many of the terms used in them (“lawful,” “do not harm the network”) are subject to different interpretations. This lack of common approach to the issue of Net Neutrality makes finding a solution (as well as analyzing the problem itself) more complicated.

In this paper, we follow the approach of the Center for Democracy and Technology (CDT) (2006) that identifies the following four essential elements of Internet Neutrality:

1. Non-discriminatory routing of packets (user can send and receive traffic to or from any other location on the Internet. Network providers route packets to network endpoints of the users’ choosing, without regard to the contents of the packets, the identities of the parties at those endpoints, or the service providers or services used by those parties).
2. User control and choice over service levels (users have the freedom to connect to the Internet at different speeds and service levels, according to their needs and budgets. The choice lies with the user; network operators generally do not deny or limit the ability to buy bandwidth based on the identity of the user or the user’s intended use).
3. Ability to create and use new services, applications, protocols, and devices without prior approval of network operators.
4. Non-discriminatory peering of backbone networks (network operators interconnect with one another on an open basis, in the sense that no network operator is denied the opportunity to interconnect. This helps ensure that customers of different network providers can all connect and communicate with one another).

We also agree with CDT (2006) authors and Daniel J. Weitzner (2006) regarding points that do not violate Net Neutrality:

1. Service-level pricing (for both end-users and content providers) is no threat to neutrality, provided that users and content-providers can choose the level of services appropriate to their needs and provided that many-to-many, end-to-end traffic flow remains possible.

2. Caching services aimed at improving the delivery of certain content is no threat to neutrality as long as network operators offer open access to their networks to unaffiliated caching services. Caching services refers to temporary storage of remote data web documents by intermediaries between content providers and end-users (e.g., ISPs) or other third parties (e.g., search engines) designed to reduce network transfers and, therefore, increase speed of download. Once data is stored in a cache, future use is possible by accessing the cached copy rather than re-fetching or recomputing the original data, so that average access time is lower.
3. Various peering arrangements (as long as they do not violate point 4 above) are no threat to neutrality. Under peering arrangements, ISPs agree to exchange traffic (i.e., allow traffic from each other to traverse their networks), usually without the payment of settlement charges.
4. Blocking and filtering of content where the content is illegal or puts users at risk of harm, such as fraud, is no threat to neutrality.
5. Prioritizing packets based on the type of traffic (such as video and VoIP) is no threat to neutrality, so long as such prioritization is equally available to any content of like type and fees (if any) are assessed on end-users rather than the content providers.

Tim Berners-Lee (2006), one of the strong proponents of Net Neutrality, summarizes the concept as we have adopted it here:

“It is of the utmost importance that, if I connect to the Internet, and you connect to the Internet, that we can then run any Internet application we want, without discrimination as to who we are or what we are doing. We pay for connection to the Net as though it were a cloud which magically delivers our packets. We may pay for a higher or a lower quality of service. We may pay for a service which has the characteristics of being good for video, or quality audio. But we each pay to connect to the Net, but no one can pay for exclusive access to me.”

We emphasize that even though we use the term Net Neutrality in this paper in accord with common use, our analysis will be limited only to the Internet. As is underlined in the CDT analysis “Preserving the Essential Internet” (CDT, 2006), broadband networks that might be affected by any neutrality legislation also carry cable television and other non-Internet services. As long as it does not interfere with the principles of a neutral Internet, network operators could retain flexibility for innovation and experimentation to address increasing demand for video and other high bandwidth applications. For example, providing a movie distributor with a separate channel to reach customers for digital movie downloads (sometimes referred to as a “virtual private network”) is not against the Net Neutrality principle as long as this service does not harm or degrade subscribers’ Internet access (CDT, 2006).

Net Neutrality Debate: Background

The **Net Neutrality** debate has recently come to the forefront of the Internet Governance debate in the US. Several relevant pieces of legislation are currently under discussion in the US Congress. Central to this debate is the idea that certain applications or content should get preferential treatment in terms of speed and reliability of content delivery. The extension of this proposal would allow ISPs to treat packets of content delivered via their networks differently, depending on what content providers are willing to pay.

The origins of this debate lie within certain practices of ISPs and Internet Bandwidth Providers (IBPs), both in the US and other countries. These practices are, in turn, prompted by such trends in the development of today's Internet as:

- broad spread and increasing popularity of low-latency applications, such as streaming video and audio, VoIP, and online games;
- increasing use of high bandwidth applications (online games, music and video downloading, including file-sharing via peer-to-peer networks), which demands further investments in network architecture development;
- increasing use of wireless home networks, which allow neighbours to share an Internet connection, thereby reducing revenues for the service providers (who charge monthly subscription fees, regardless of traffic);
- development of new applications for voice and video transfer over the Internet (including VoIP technology) that threaten the revenues of traditional telecom providers who also offer Internet access;
- improvements in networking technology, which make providing broadband service less expensive;
- government and municipal investments in the construction of Internet infrastructure, including wireless networks (David, 2006).

To protect their economic interests regarding these developments, many ISPs have begun to introduce practices that many users and observers deem illegal or harmful for the future of the Internet. By both technical and legal (subscriber agreements) means, ISPs attempt to prevent users from installing wireless routing devices (which is termed "theft of service") and from using VoIP and file-sharing software. In addition, ISPs have been reported to block access to certain websites and to filter emails that contain criticism about them.

The trend towards a "non-neutral" Internet is taking different forms around the world. According to Michael Geist (2005),

"in the developing world, where there is frequently limited tele-communications competition, many countries have begun blocking Internet telephony services in order to protect the incumbent telecoms provider. . . . In Europe, some ISPs have similarly begun to block access to Internet telephony services. For example, this summer reports from Germany indicated that Vodafone had begun to block Voice over Internet Protocol (VoIP) traffic, treating the popular Skype program as "inappropriate content."

In addition, some representatives of telecommunication companies have speculated on the possibility of charging an extra fee to content providers who want their pages to download

more quickly than of those who do not pay. Thus, ISPs could give priority to certain bits over others, differentiating service based on content. According to Geist (2005),

“some ISPs see the potential for greater revenue by charging websites or services for priority access to their customers. In the US, BellSouth Chief Technology Officer executive William L. Smith, recently mused about the potential to charge a premium to websites for prioritization downloading, noting that Yahoo could pay to load faster than Google. Reports last week indicated that BellSouth and AT&T are now lobbying the US Congress for the right to create a two-tiered Internet, where their own Internet services would be transmitted faster and more efficiently than those of their competitors.”

The legal norms and regulations of the pre-Internet (or pre-broadband) period have proved inadequate for resolving the Net Neutrality controversy. In the USA, common carrier rules have been significant for regulating both telephone networks and dial-up access. However, in a number of decisions, US courts and administrative bodies have denied any application of common carrier rules to broadband networks. In 2005, the US Supreme Court decision in the *Brand X* case supported the FCC policy of classifying cable modem service as exempt from all common carrier regulation. Later, the FCC classified Digital Subscriber Line (DSL, the technology that increases the digital capacity of regular telephone lines) services as also exempt from common carriage obligations. As a result, no rules bar discrimination on broadband networks.

To understand the current debates it is also important to take the differences between dialup and broadband access into account. With thousands of ISPs offering dial-up access and low barriers to entry to this market it has been easy for end-users to change their ISP. In addition, telephone companies providing connections were legally prohibited from engaging in any type of discrimination. However, in the case of broadband access, the consumer can choose only among a handful of providers. From the access provider's perspective, the barriers to entry in the broadband world are much greater than the barriers to entry as an ISP in the dial-up world. In addition, today's network operators are often part of large holdings that may include various types of content or services transmitted over the Internet. Finally, broadband access providers are no longer subject to the neutrality obligations that come with common carriage status, and the cable companies never were subject to neutrality obligations.

It is not surprising that such a situation invited strong opposition on behalf of end-users and companies, including several major content providers. In November 2002, they united to form the Coalition of Broadband Users and Innovators to lobby the US Federal Communications Commission to prevent the implementation of “restrictions designed to block or impair access to Internet content, services or devices on their networks” (Mark, 2002). Those arguing in favour of protecting Net Neutrality include such companies as Amazon.com, Google, eBay, Microsoft, Yahoo!, several consumer rights associations and other non-profit organizations (Consumer Electronics Association, National Association of Manufacturers, Free Press, Consumers Union, Common Cause, and MoveOn), think tanks (Progress and Freedom Foundation), well-known Internet academics such as Lawrence Lessig, Vincent Cerf, and Tim Wu, members of the Internet community (both technical specialists, including Sir Tim Berners-Lee, and opinion leaders), and media critics. Federal Communications Commission Chairman Michael Powell became the first government official to endorse Network Neutrality.

Net Neutrality opponents are principally financially powerful companies with significant market power (telecommunications companies, such as Verizon, Comcast, AT&T, cable companies and their associations, and equipment vendors), who employ the potential of business associations (including the US Chamber of Commerce) and business-oriented interest groups and enjoy the support of such free-market scholars as Christopher Yoo and Adam Thierer to promote their cause.

In sum, the Net Neutrality debate asks whether ISPs have the right to discriminate speed of delivery based upon type of application, source, nature of content, pricing, or other criteria affecting existing technologies and those still in development or not yet fully implemented. The debate pits idealists advocating a neutral Internet against commercial interests with a high stake in pricing strategies and political solution advocates against free market proponents. It cannot ignore the fact that decisions made now will affect further impetus to innovation, investment, and development. Further complicating matters, the "map" of this debate is far from black-and-white as possible solutions cross theoretical positions. Members from each camp differ on exact definitions of terms and policies that support their side in the argument, and some of those who speak in favour of neutrality, such as Sir Tim Berners-Lee and the Comcast Corporation, also suggest that this result can best be achieved by market forces rather than by any external intervention.

The Net Neutrality Debate: The Free Market Solution

One side of the Net Neutrality debate is represented by those who believe that the best approach to the situation would be to avoid governmental regulation of the field as much as possible. They have different views on whether the Internet should remain neutral, but they all agree that market forces, not governmental involvement, will ensure “the best possible outcome” of the debate, whatever outcome they think is the best one.

Arguments in support of the “free market solution” can, therefore, be divided in two broad categories. Some of them are directed specifically against the Net Neutrality principle. Others are shared by both opponents and supporters of Net Neutrality, and suggest that market forces, rather than external regulatory intervention, will lead to a solution that will best satisfy the interests of all stakeholders, including content producers, IBPs and ISPs, and end-users. We will now briefly describe both of these categories.

The main arguments against the Net Neutrality principle rest on technical, economic, and legal grounds. First, many authors believe that as the Internet is changing, old protocols and architectures that may have enabled its functioning and growth in the past (one of them the principle of Net Neutrality) will hinder the development of new applications and uses of the Internet. This is the case, for example, with such applications as streaming video and audio, and online gaming. According to Paul David (2006),

these services are intolerant of perceptibly long delays in transmission (“latency” in the language of specialists). Such delays, however, are a characteristic of the Internet’s “best effort” approach to the step-wise forwarding of data packets between the sender and the host computer on which they are reassembled for collection by the designated receiver.

The opponents of Net Neutrality claim that unless such innovative services receive priority over other kinds of Internet traffic (e.g., email or web pages), their quality will remain poor, which will prevent them from fully developing and gaining a substantial market share (Orlowski 2006). The risks associated with this scenario, they claim, are especially high for countries and regions where bandwidth capacity does not grow fast enough to ensure quality of service without prioritizing any traffic. Moreover, it is sometimes stated that not only different *types* of traffic, but even different *content* requires appropriate treatment. As Larry Dignan (2006) points out,

“all traffic isn’t created equal. An e-mail doesn’t have the same service requirements as a VoIP call. An X-ray of a heart patient should have priority over a Britney Spears video. Corporate networks manage traffic that way, and at some point there has to be some intelligence added to public Internet infrastructure between the end-points.”

Second, many points raised by the opponents of the Net Neutrality principle are of economic nature and have to do with pricing schemes, marketing strategies, or competition. One such issue stems from the fact that most broadband providers in the US (the situation is different in other countries) currently offer unlimited Internet access for a flat monthly rate. Such pricing scheme rests on the assumption that traffic usage by each of the end-users is roughly equal and is within some reasonable limits. However, today more and more end-users engage in peer-to-peer file sharing (for example, exchanging movies online) or install wireless routers and other devices that enable many users (perhaps, a whole neighbourhood) to use a single Internet connection. In either case, traffic consumption by the end-user is much higher than average. Faced with this situation, providers claim that they have no other option to avoid losses, short of raising the fee for all subscribers, but to fight such practices – which they term “theft of service” – by both legal (via relevant

provisions in end-user contracts) and technical means (e.g., by discriminating against or blocking peer-to-peer traffic). Any such measures constitute a violation of the Net Neutrality principle).

Other arguments of an economic nature claim that any Net Neutrality regulation would impose unfair limitations on freedom of contract (i.e., prioritization of certain traffic should not be prohibited if both content providers and ISPs agree on the terms of their cooperation [Krim 2005]), ignore multiple “rational reasons for discrimination” including as brand promotion, and preclude the use of such marketing strategies as “bundled service packages” (Thierer, 2004a). Depriving Internet providers of these sources of revenue will limit the amount of funds available for investment in further development of network infrastructure. According to some of these authors (Krim, 2005), it is also perfectly legal and within the market logic for ISPs to block access to competing sites – just as a TV channel does not run commercials of competing channels. Moreover, authors like Yoo (2004) believe that if competition strategies of internet providers are limited only to network size and price (which is, to them, a natural outcome of Net Neutrality regulations), this will favour only the largest players in the market and ultimately result in

“entrenching the oligopoly of last-mile providers that represents the central policy problem facing the broadband industry. In other words, mandating network neutrality raises the real danger that regulation would become the source of, rather than the solution to, market failure.”

Third, on a legal basis any possible Net Neutrality regulations are regarded as and opposed as an infringement on the private property rights of network owners. Thierer (2004a) emphasizes that “while no one entity controls it [the Internet] in its entirety, many individual segments of the Internet are privately owned and operated.” This argument also has a strong economic component related to the need for future investments in the telecom infrastructure. If current Internet providers feel that they are deprived of control of the networks in which they have invested so much and have come to regard as their private property, it will discourage them from investing necessary funds in the future development of the Internet infrastructure.

In addition to those who oppose the very idea of Net Neutrality, some authors warn against governmental involvement in the situation, although do not necessarily oppose the Net Neutrality principle. Says Tom Giovanetti (2006), president of the Lewisville, Texas-based Institute for Policy Innovation: “Here’s a proposed solution to the current debate over new network-neutrality regulations: How about let’s do nothing – at least not now?”

What are the reasons for such approach? First, some authors argue that regulation is redundant – market forces will ensure that the interests of both businesses and end-users are met to the greatest extent. Discrimination against any content providers is not in the long-term interest of any internet provider, they claim, as it will lead to customer dissatisfaction and will contribute to loss of customers in the long-run. In today’s technological environment characterized (especially in the US) by a number of alternative ways to access the Internet,

“no firm or industry has any sort of “bottleneck control” over or market power in the broadband marketplace; it is very much a competitive free-for-all, and no one has any idea what the future market will look like with so many new technologies and operators entering the picture. (Thierer, 2004a)”

The second important argument against regulation is that, in addition to being unnecessary, it can have strong negative effects on the market situation, including unintended, possibly delayed consequences. According to the proponents of this point of view, trying to impose

Net Neutrality rules “from the outside” rather than letting the market find the best solution may distort the market, hurt competition, and stifle innovation. Deeply rooted mistrust of government is one of the reasons behind such position. Larry Dignan (2006) puts it very straightforwardly in a *Baseline Magazine* article saying that the vital reason against regulation of the Net Neutrality issue is that “Congress will screw it up.” Interestingly, regulators themselves voice a certain caution with regard to regulation. The head of the US Federal Trade Commission, Deborah Platt Majoras, as quoted in an *Information Week* article, argued that industry-wide regulatory schemes should not be imposed without a cost-benefit analysis and consideration of whether another, less broad approach could be a better way to address potential harm.

“Broad regulatory mandates that employ a “one size fits all” philosophy, without regard to specific facts, always have unintended consequences, some of which may be harmful and some of which may not be known until far into the future, she said. “We should look at whether any net neutrality or similar legislation could have the effect of entrenching existing broadband platforms and market positions, as well as adversely affecting the levels and areas of future innovation and investment in this industry. The end result could be a diminution, rather than an increase, in competition, to the detriment of consumers.” (Jones, 2006)”

The problem of “regulatory capture,” the development of close relationships between the regulators and those regulated, is mentioned quite often in this regard. Whenever such situation occurs, it ultimately makes the industry less competitive than it would have been had a free market solution been chosen – the railroad (and transportation in general) monopoly in the US is often cited as an example of such capture. It is therefore not unusual for advocates of deregulation to accuse their opponents of trying to use government involvement to gain unfair market advantage. Sonia Arrison (2006) from *TechNewsWorld* believes that “using government regulation preemptively to shortchange business partners is a reckless abuse of the public policy process. New laws should be based on facts and reality, not fear and hypothetical situations.”

As can be seen from the brief summary of arguments presented above, governmental regulation of the Net Neutrality issue is opposed (and a “free market solution” is upheld) on a variety of grounds. Some of the arguments are against the very concept of Net Neutrality; these include technical, economic, and legal considerations. Some claim that strict adherence to the idea of the “neutral net” will preclude the development of innovative applications and uses of the Internet; increase access costs for end-users; limit the funds that can be invested in further development of network infrastructure; distort competition in the Internet access market and even lead to “the oligopoly of last-mile providers;” and violate property rights of network owners. In addition, powerful arguments are made against any governmental regulation in general, whether for or against Net Neutrality. Based on examples of regulating monopolies in the US, the advocates of a free market solution claim that government involvement in the Net Neutrality issue is not only unnecessary, but potentially can be harmful to the interests of various stakeholders, including both Internet businesses and end-users. However, advocates of political solutions to the Net Neutrality debate strongly oppose this perspective.

The Net Neutrality Debate: The Political Intervention Solution

Many supporters of political intervention to protect Net Neutrality share the perception of the Internet as a ubiquitous “public good,” which necessitates its monitoring by state agencies to ensure its smooth continuance. The advocates of Net Neutrality are critical of their opponents’ promises to improve services for those who pay an extra fee and not degrade it for those who do not pay. According to Gigi Sohn, president of Public Knowledge, a digital rights advocacy group,

“prioritization is just another word for degrading your competitor. . . . If we want to ruin the Internet, we’ll turn it into a cable TV system that carries programming from only those who pay the cable operators for transmission. (Krim, 2005)”

In the view of those who advocate a political solution, a political intervention in the Net Neutrality dilemma will actually support the free market, as it will prohibit unfair practices imposed by non-transparent monopolies. They warn that unless Net Neutrality is ensured through governmental regulation, unseen distortions tantamount to subliminal manipulations through imposed availability and slowdowns will alter customer practices, not through choice, but through artificial norms dictated by ruling commercial entities. In a situation when economic strength can buy control of bandwidth and speed, this, rather than better service and innovations for improving applications, will ultimately determine the market share acquired. The market will be distorted and the creative impetus that has characterized the evolution of the Internet will be slowed. According to Ethan Zuckerman (2006):

“What may happen to companies in this brave new world? Soon, it no longer may be sufficient to know that you’re connected to “the Internet” – businesses will need to know where the bits they want are, and whether the provider they’re using for Internet service considers them premium or substandard. It will no longer be possible for a start-up to put a site on the Internet and assume that it’s equally accessible to everyone in the world. And existing companies may suddenly discover that they are reaching much smaller audiences than they’ve grown used to. The fragmentation of the Internet is the fragmentation of markets. “

The advocates of a political solution to the Net Neutrality dilemma argue that in the supposedly “free market” environment content providers and ISPs that can pay will be able to get a commercial advantage over those that cannot; if so, institutions like universities and charities would suffer. It is also quite likely that any extra charges levied on content providers will fall to end-users (Fildes, 2006). These policies will eventually result in the creation of a “two-tiered Internet,” in which those having “VIP” access will enjoy privileges in terms of speed and access to certain contents.

Lessig and McChesney (2006) mention a number of industries that rely on fast and secure Internet connections, saying that these will be the first to suffer: “Major industries such as health care, finance, retailing and gambling would face huge tariffs for fast, secure Internet use—all subject to discriminatory and exclusive dealmaking with telephone and cable giants.” They use the metaphor of highways and tolls to describe the two-tiered Internet. If Net Neutrality legislation is not adopted, large telecommunication companies

“would be able to sell access to the express lane to deep-pocketed corporations and relegate everyone else to the digital equivalent of a winding dirt road. Worse still, these gatekeepers would determine who gets premium treatment and who doesn't. Their idea is to stand between the content provider and the consumer, demanding a toll to guarantee quality delivery. (Lessig and McChesney, 2006)”

The advocates of Net Neutrality also contest their opponents' argument that extra fees for premium services are necessary for further development of network infrastructure. According to Clark and Blumenthal (2001), if everything is left to market forces, “islands of enhanced service” will develop. This would lead to increased investments in such islands and less investment in the general development of the network. Such a scenario contradicts the pro-market argument that ISPs need the extra income from premium and enhanced services to invest in developing the network for everyone:

“Investment in closed islands of enhanced service, combined with investment in content servers within each island, decreases the motivation for investment in the alternative of open end to end services. Once started down one path of investment, the alternative may be harder to achieve. (Clark and Blumenthal, 2001)”

Besides economic effects (unfair practices by monopolies and lack of competition in the Internet access market), the creation of a two-tiered Internet and, essentially, a limitation of end-user choices can have strong political consequences. By slowing or hiding access to certain contents, ISPs can, in the long-run, shape the users' information environments and indirectly influence their opinions and choices. Even though this scenario may be unrealistic for the near future, the possible long-term effects of decisions made today should not be overlooked.

Another argument offered by free-market advocates is that the Internet grew up unregulated. However, this argument does not find support among those who propose a political intervention solution. They point out that the Internet evolved unrestrainedly in a startlingly creative academic and military environment until commercial interests became involved. The introduction of commercial interests in the Internet equation leads to possible distortions that require control through appropriate regulation. The innovation and creativity that characterize the rapid growth of the Internet risks frustration by imposition of economic control by a few large private interests. A well-designed, socio-political framework will allow service and innovative implementation of applications to determine market advantage.

In fact, worldwide regulatory history supports control of monopolies. Lack of competition, particularly in developing countries, can be devastating if costs are not controlled by the need to compete fairly. Behind the scenes, control of delivery systems amounts to an invisible monopoly.

Precedents for regulation are available. A US Federal Communications Commission Policy Statement FCC05-151 adopted on August 5, 2005 affirms that: “To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet, consumers are entitled to competition among network providers, application and service providers, and content providers” (FCC, 2005b). In at least one case (Madison River case in 2004), the FCC did intervene on behalf of end-users to stop unfair blocking of VoIP applications (FCC, 2006). However, such regulation can lead to different types of legislation, ranging from all-encompassing law covering all possible aspects of Net Neutrality to legislation narrowly focussed on Internet neutrality (CDT, 2006), rather than including the broader issue of network neutrality (related to other non-Internet services over broadband).

Even so, pro-Net Neutrality regulation is not the only solution to the problems outlined above. For example, Stanford University law professor Lawrence Lessig suggests that Internet access be treated as a universal public good: if a government were to supply WiFi or fixed line access to its citizens, it would be available to all, and speed would become less important. This, according to Lessig, “would restrict carriers’ ability to charge content providers different fees in order to prioritize delivery of their data packets across the Internet” (Clarke, 2006).

The political solution argument proposes that as a public good, the Internet be regulated to ensure equal access for all consumers. It holds that only regulation can maintain a fair and neutral net. Without legislation, commercial interests will override consumers’ rights and pricing distortions, rather than improvements in service, will direct market share. The Madison River case demonstrates that political intervention via legislation and other forms of regulation can protect end-users. In addition, as Lessig shows, governments can alleviate the economic and political risks associated with the creation of two-tiered Internet by ensuring citizens’ access to a neutral network. In any case, governmental intervention is necessary to resolve the current situation.

The Network Neutrality Debate and Developing Countries

The Net Neutrality debate is currently taking place in a number of countries such as the US, Japan, Norway, and Italy. The decisions made on the domestic level in each of these countries will shape the future of the Internet in the rest of the world. It is thus of utmost importance for developing countries to understand which scenario, that of a free market or that of political intervention, might better respond to their interests and concerns.

Developing countries are particularly vulnerable to the negative effects of different kinds of Internet segmentation because they tend to have deficiencies in the tools and experience to deal with these complexities. Economic threats to Net Neutrality have a specific importance for developing economies because their consumers already pay more for goods and services, due to factors such as lower levels of competition. This is clearly shown, for example, in Internet access rates in Venezuela, where similar monthly charges are easily triple those found in the US. We must carefully consider how threats to Net Neutrality may affect developing countries and development, finding a way to support and improve flow of information and services, and avoiding the risk of exacerbating pre-existing conditions.

In our view, even if some arguments of free market advocates apply in developed countries, they are much less persuasive when one considers the circumstances of developing countries. First, unlike the situation in many developed countries, users in developing countries are often dependent on one “bottleneck” ISP. Thus, the risk of ISP market concentration is much higher in developing countries where fewer opportunities to acquire Internet access exist. Moreover, many countries connect to the Internet through one Internet broadband provider, which can essentially shape user experience in that country by prioritizing certain content providers over others.

Second, the telecom-ISP convergence is much stronger in many developing countries. In most cases the leading or monopolist telecommunications company is also the leading or monopolist ISP; therefore, the development of such innovative services as VoIP will be severely limited if local ISPs have the right to prevent users from access. This already occurs in countries as diverse as Panama, Oman, United Arab Emirates, and Mexico (Geist, 2005). Such policy reduces competitive choices for telecommunications services and cuts consumers from one of the fastest growing segments of the Internet. The WGIG (2006) develops the point:

“In many developing countries, the use of newer and lower cost technologies, like Voice over Internet Protocol (VoIP), are seen as more as threats than as beneficial. This is because they deprive national carriers of the revenue needed to modernize infrastructure and to deploy widely new technologies such as Internet. This applies regardless of whether a country has a liberalized competitive regime or a traditional monopoly one.”

Third, while it may be true that developing Internet infrastructure needs large investments, it is not obvious that profits gained from premium services (even services offered in developing countries) will be channelled to further the development of infrastructure for everyone. This is especially doubtful if this money goes to transnational IBPs interested in building a VIP Internet wherever it may be most profitable (most likely not in developing countries).

Finally, a two-tiered Internet will carry negative consequences for content providers and other businesses in developing countries. Companies that cannot pay an extra fee to IBPs to ensure rapid access to their pages run the risk of losing markets. This may lead to the inclusion of websites of firms, universities, and agencies from developed countries in the VIP Internet and the exclusion of those from developing countries, deepening the digital divide.

Moreover, according to Clark and Blumenthal (2001), "It may well be that certain kinds of innovation would be stifled if the open and transparent nature of the Internet were to erode." If that were the case, the pattern of innovation on the Internet would be altered, increasing its costs and becoming a privilege for rich and developed countries, again further widening the digital divide. This is one of the points emphasized by Michael Geist (2006) at a recent "Access to Knowledge" conference held at Yale University.

These points demonstrate that the problem of Net Neutrality is even more important for developing countries than for developed ones. Pro-market arguments, which may be valid in countries with well-developed ISP markets and multiple Internet access options for users, are much less persuasive in the case of developing countries. At the same time, the possible negative effects of abandoning Net Neutrality and building a two-tiered Internet are much more severe for developing countries. In this situation, strict adherence to Net Neutrality principles and their enforcement by means of governmental regulations will protect the interests of both businesses and individual users.

Net Diversity

Multiple forces promoting change in a direction that may contradict Net Neutrality presently challenge the open and flexible architecture of the Internet. An open, generative and innovative Internet, derived from the Net Neutrality principle is a characteristic worth preservation. A technical principle such as end-to-end (a strict application of “dumb” network, “smart” terminals), is insufficient as a basis for the future Internet governance regime. Internet openness should rest not only on technical assumptions, but on political and legal conditions. Indeed, a holistic approach (legal, social, economic) is vital, since the widest possible context in which technical solutions arise demands consideration. Law, technology, and markets are different mechanisms used to achieve a balance of power among different actors and, therefore, their political implications should be included.

A possible solution to the Net Neutrality controversy may lie somewhere between complete abandonment of Net Neutrality and absolute adherence to it. Here, we find some authors (Noam, 2006; Weitzner, 2006; Yoo, 2006) who propose a compromise: they want preservation of Net Neutrality, in conjunction with technological and security demands. This equates to the abandonment of Net Neutrality as an absolute and to the imposition of certain limitations or restrictions on it. These authors support an alternative principle to Net Neutrality, in effect, Net Diversity. They state that it would be positive to allow a differentiation of prices and services in order to meet heterogeneous demands and needs. In their vision, a range of specialized nets could arise: a traditional one for email and website access, another one with special security requirements for e-commerce and e-government, and one for latency-sensitive applications such as media streaming and VoIP. While the first would respect the Net Neutrality principle, the others would abandon it and shift towards another paradigm that places intelligence at the core of the net (thus abandoning the technological architecture based on the end-to-end principle).

A Net Diversity approach offers a number of advantages, some of which are particularly attractive for developing countries:

- **Transparency.** With a clearly stipulated separation of functions, middle- and final-users are more likely to understand what they are paying for, instead of trying to decipher a “behind the scenes” strategy of pricing, speed, distortion of services, and possible discrimination. Developing countries will be able to prioritize areas for investment both as users and as providers.
- **Framework for innovation.** Providers will create their own niches in particular areas without having to provide a “full service.” This would support the development of more small and local enterprises. Thus, as its name implies, it will foster diversity and permit the flexibility necessary for start-up companies in developing countries to compete.
- **Formalization of neutrality in one network.** Instead of doing away with Net Neutrality, Net Diversity formalizes Net Neutrality in one network, facilitating at least basic access. This would guarantee lower costs at this level, permitting areas in development to have access for information and data since this level will no longer be subsidizing high bandwidth applications.

Net Diversity will provide a compromise between different values, interests, and needs, thus promoting further technological innovation and change.

Although not restricted to developing countries, Yoo (2004) underlines the benefits of differentiated services.

“For example, it is conceivable that allowing networks to differentiate themselves might make it possible for multiple last-mile networks to coexist by serving the needs of a different subgroup: one optimizing its network for conventional Internet applications such as e-mail and website access, another incorporating security features to facilitate e-commerce, a third employing routers that prioritize packets in the manner needed to facilitate time-sensitive applications such as Internet telephony, generally known as “voice over Internet protocol” (VoIP), with others targeting other needs.”

From Yoo’s perspective, no discrimination would occur inside a particular net. Instead, multiple nets would provide different services and meet different demands. Different technological principles would govern these differentiated nets and, therefore, each would need specific regulations and legal frames. Therefore, Net Neutrality would be preserved and regulated in the “traditional” net, while those nets addressing other needs would not be framed under this principle. This differentiation in the services provided by the multiple nets would reflect the heterogeneity of preferences and demands, thus encompassing different technological and legal requirements.

In what seems to be a precursor to Net Diversity, Eli Noam proposed a “third way” to solve the Net Neutrality dilemma by differentiating between “‘last-mile pipes’ that reach individual end-users, and ‘middle-pipes’ that constitute the local and national network system and serve numerous users simultaneously.” Suggesting that these two sets of pipes be dealt with differently, he writes:

“This arrangement, by separating the last-mile pipe where potential problems exist, from the middle-pipes, where they do not, provides both openness and minimal intervention. It responds to both sides’ legitimate problems, not as a “divide-the-baby-in-half” compromise, but as a genuinely better system. (Noam, 2006)”

Given the growing importance of the Internet for various spheres of human activities, one can confidently predict that the demand for new latency-sensitive applications and security will only increase in the future; it is very likely, therefore, that the evolution of the Internet will make some compromise on Net Neutrality necessary. Net Diversity would provide such a compromise between all these interests and values, respecting equality and non-discrimination inside each net. This arrangement guarantees transparency and access through a system that, though structured, will still allow for new applications. This option might be the best for developing countries, as it would make it possible to meet their needs for security and openness.

Both those who stand for a free market solution (Yoo, 2006) and those who stand for a political solution (CDT, 2006) support Net Diversity in different versions. Many advocates of a political solution argue in favour of a “narrowly tailored legislation to preserve the essential neutrality and openness of the Internet, while leaving broadband network providers free to experiment with non-neutral arrangements elsewhere on their networks” (Thierer, 2004b). Likewise, the CDT (2006) suggests that

legislation should protect the core characteristics of the Internet in the least intrusive possible manner, leaving flexibility for innovation and experimentation to address increasing demand for video and other high bandwidth applications. An appropriate legislative framework should include some basic rules requiring network operators to preserve nondiscrimination and openness, but only on those portions of broadband networks dedicated to the Internet. At the same time, the rules should be carefully crafted so as not to interfere with new offerings on the video or other non-Internet portion of a network operator’s business.

Another important possibility that has the potential of ensuring that the Internet remain neutral and accessible to all, while businesses remain free to experiment with premium services, is the development of public networks. Many pro-Neutrality authors, including Lawrence Lessig, emphasize this solution. Stephen Wildstrom (2006) in a *Business Week* article entitled, "The War for the Net's Future," speaks of this approach as "a middle ground: We must acknowledge that public networks for everyone can exist alongside premium, private ones, and that these two types of networks can live by different rules."

Conclusion

The current Net Neutrality debate is of special importance for developing countries as they are particularly vulnerable to the negative effects that may ensue if the Internet is left completely to market forces. Implementing the principle of Net Diversity through legal protection of neutrality rules for Internet access, while allowing ISPs to experiment with various premium services in other networks, will be in the best interest of developing countries. Such policies could be enhanced by developing public networks and ensuring that they remain neutral in the meaning of the term used throughout this paper. Although this two-pronged approach, combining Net Diversity and public networks, seems complex to implement, it may be one of the best ways of resolving the current Net Neutrality debate and protecting the interests of both end-users and businesses in developed as well as developing countries.

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Biographies

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Romina was born in Buenos Aires, Argentina. She studied law at the University of Buenos Aires and graduated in 1999 with two specializations: civil law and commercial law. She received the “Roque Fortunato Garrido Prize” for her marks in civil law and the Golden Medal prize for having the highest mark average of her graduation. She worked as a lawyer, both in public and private sectors. In 2004, she attended the Postgraduate course on ICT and Diplomacy organized by DiploFoundation and the University of Malta. Then in 2006, she participated in the Internet Governance Capacity Building Programme and attended the Internet Governance Forum held in Athens, thanks to a fellowship granted by DiploFoundation. During 2005 and 2006, she attended the two-year diplomatic formation course at ISEN, the Argentine diplomatic academy, graduating in December 2006 with a Golden Medal. In January 2007, she was appointed diplomat (third Secretary and Consul).



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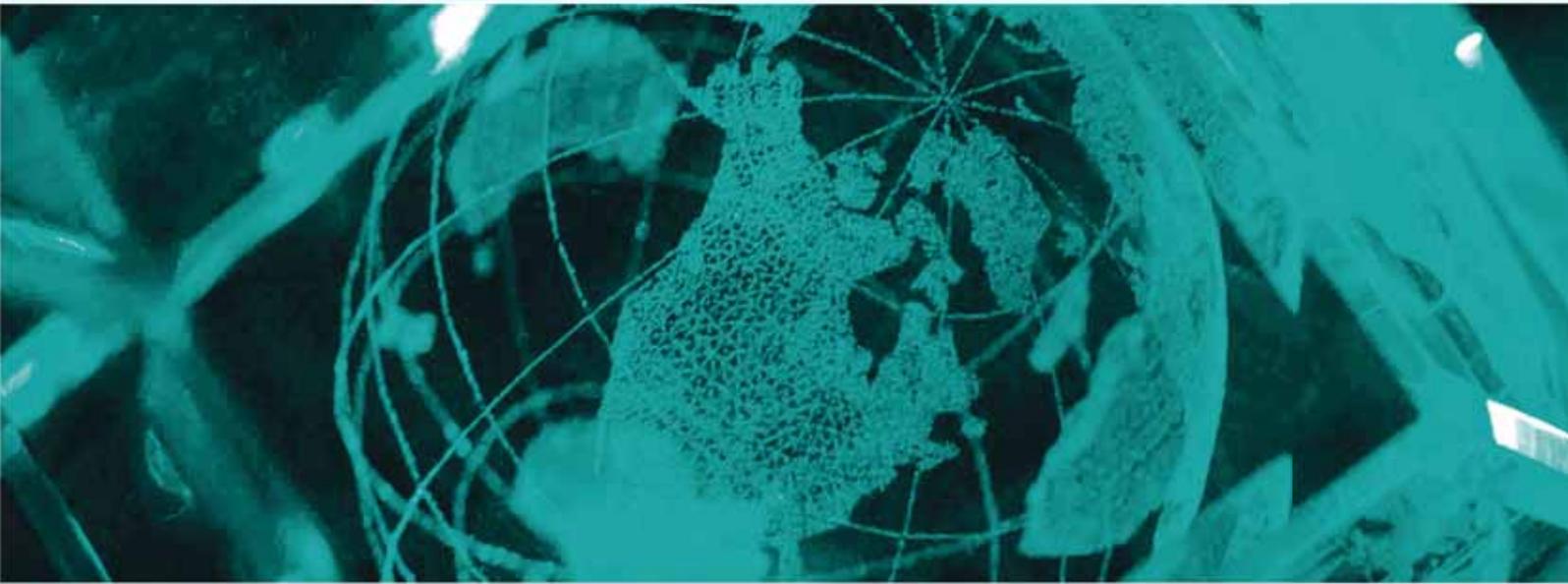


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List of Discussion Papers:

2. Promoting e-Commerce in Developing Countries
3. A study of the UN Working Group on Internet Governance
4. World Summit on Information Society and Development of Internet Diplomacy

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