ISSN: 1918-5901 (English) -- ISSN: 1918-591X (Français)

Network Neutrality: A Thematic Analysis of Policy

Perspectives Across the Globe

A Policy Review by

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This policy review looks at four types of Internet traffic management policies across the globe: legal regulation, transparency, non-neutrality, and government control. Each of these has been employed to varying degrees by states to addressing the growing concern about "network neutrality".

Policymakers have used the term "network neutrality" to refer to a variety of perspectives about whether or not openness is a "fundamental" aspect of the Internet. This issue has been hotly debated across the globe as policymakers have sought to create appropriate Internet policies within their countries. In essence, policy makers must decide whether to keep the Internet "open" through regulation that would restrict Internet Service Providers (ISPs) from deciding the speed of service based upon content or financial interest. This review will provide a general summary of network neutrality and the concerns raised from different perspectives on the issue. Moreover, this review will present a thematic analysis of current policy positions from countries in North America, Europe, Australia and Asia to demonstrate the variety of approaches governments may take in developing network neutrality policies. From this analysis, four thematic positions are clear: legal regulation, transparency, non-neutrality, and government control.

Background: What is Network Neutrality, and Why does it Matter?

Network neutrality is a concept that suggests ISPs or other user access networks should not advocate restrictions or regulations on content, specific Internet sites, or Internet platforms. The reason why network neutrality is an issue is due to the design of the Internet. The Internet boasts three interesting design qualities that separate this medium from other telecommunications media. First, the Internet comprises a number of *layers*. In other words, functional tasks are divided up and assigned to different layers. This system creates a network of modular "building blocks" in which applications or protocols at higher layers can be developed or modified without

impact on lower layers, while lower layers can adopt new transmission or switch technologies without requiring changes to the upper layers (Cerf, 2009). This layered system has made possible the unhampered delivery of information packets from one point to another.

Secondly, the Internet operates in an *end-to-end* design where applications are implemented on the Internet. According to Cerf, the Internet was designed to allow applications to reside at the edges of the network, rather than in the core of the network itself, which is opposite of telephone or cable networks, where applications and content are implemented in the central offices, away from the users at the edge (Cerf, 2009). Because of the Internet's unique design, the power and functionality of the medium resides along the edges and in the hands of the end user. In sum, users not only select content as they would select a channel off of their cable, but they are potential creators of the content that is available for use.

Third, the design of Internet Protocol (IP) separates the underlying networks from the services that reside on layers above them. From its inception, IP was designed to be an open standard (Cerf, 2009). In other words, any user of the Internet could also create applications and new networks. IPs therefore are indifferent to the underlying physical networks that carry information packets. The Internet is fundamentally different than telephone lines or mail because of the transmission of these Internet information packets. When a person places a telephone call, there is a single line dedicated between the caller and the receiver. However, when a website loads, there are no dedicated lines between the receiving computer and the website. Instead websites send data in many separate "packets", each containing pieces of information that are used to assemble the web-page at the receiving computer with each packet possibly having taken a separate route, but always selecting the fastest of the available routes (Bhardwaj, 2006). Supporters of network neutrality suggest that the Internet does not need to know what are in those packets in order to carry them to their destinations because the Internet carries and routes data equally, without favoring certain applications or content providers over others (Cerf, 2009).

The Argument in Support of Network Neutrality

At the heart the argument in favor of network neutrality regulation is the notion that there should be no central gatekeepers exerting control over the Internet. Supporters of network neutrality believe that applications and content should fail or succeed based upon the interest of the users, rather than having any intermediaries. Those in support of network neutrality argue that the Internet is a platform for innovation, and allowing ISPs to have control over what information arrives to whom, and when, based upon content, is likely to squelch the innovative nature of the Internet.

The individual who coined the term "network neutrality", scholar Tim Wu, claimed that ensuring network neutrality would enable regulators to prevent ISPs from discriminating between websites, or other online services. Wu (2006) stated:

If people like instapundit.com better than cnn.com, that is where people will go. If they like the search engine A9 better than Google, they vote with their clicks. It is a problem then, if the gate keepers of the Internet discriminate between favored and disfavored uses of the Internet? What if AT&T makes it slower and harder to reach Gmail and quicker and easier to reach Yahoo! mail?

Wu (2006) further argued that without network neutrality, competition and innovation would suffer. Using an interesting metaphor Wu (2006) illustrated the problem:

What if certain car manufacturers struck a deal with highway regulators? If highways could choose which brand of automobile got to drive in the fast lane, the consumer might buy a Pontiac instead of a Toyota, not because the Pontiac is a good car . . . as a result, the nature of competition among car makers would change. Rather than try to make the best product, they would battle to make deals with the highways.

Wu suggested that allowing ISPs to decide which type of Internet traffic is awarded a faster speed is a type of Internet discrimination. Furthermore, by allowing for such practices to take place within Internet companies the current open platform of the Internet, that allows for great innovation, will be crushed under a marketplace where companies bid (regardless of under interest or content quality) and pay the ISPs for priority service without trying to improve their products.

The concept of discrimination appears frequently in the net neutrality debate. Bhardwaj (2007) argued that the Internet is the most important, most democratic, and most open forum for free speech that exists among the variety of media. Therefore, Bhardwaj (2007) claimed that allowing ISPs to charge fees for content *providers* is a type of Internet prejudice. However, even under the umbrella of network neutrality regulation, an ISP could provide various tiers of service depending upon the needs of the *subscriber*. What concerned Bhardwaj is the type of *fee based net prejudice* where an ISP could charge websites an extra fee to enable them to be reached faster than other websites. This preferential treatment of Internet data, according to Bhardwaj, is sometimes referred to as "Quality of Service" (QoS).

QoS would allow for preferential treatment of information packets based upon a classification system for the packet content. For instance, audio and video packets need to be played in a certain order to make logical sense, which would be classified and routed separately. In another scenario, packets that contain emergency status information could be classified as such and given priority. However, network neutrality proponents argue that simply increasing bandwidth across the network would be less expensive and easier to implement than QoS systems (Bhardwaj, 2007). Net neutrality proponents argue that ISPs operating under QoS standards are not actually improving the Internet or providing a "service". Rather, they allow some websites to arrive faster by stepping in line in front of the websites that do not pay for the faster transfer. In a worst case scenario ISPs might even block entire websites to ensure that only the websites paying for the faster services will be available to the customer using that ISP.

Cerf (2009) raised two important points in support of net neutrality. First, the Internet market is special in terms of other telecommunication industries. Since telecommunication markets tend towards high levels of market concentration with limited patterns of competition, there is a potential for network operators to distort competition and innovation in vertical markets (see also Blevins, 2002; and Blevins 2004). Second, for true competition to exist consumers must be empowered to select content, and this can only occur over open networks. To address these items, Cerf has advocated network neutrality rules that are narrowly tailored toward non-discrimination, and require ISPs to operate with transparency by disclosing in plain language the actual performance that consumers should expect from their select service tier.

The Argument Against Network Neutrality

A number of for-profit telecommunications companies, telecommunications equipment manufacturers, ISPs and some politicians have become vocal opponents of network neutrality legislation. ISPs argue that websites have the benefit of using their service free of charge and that new services, such as multi-player online gaming, require faster response times, which bog down the current system. As Farber (2006) put it, neutrality initiatives will only preserve the "old Internet" while threatening to stifle the emergence of a new "updated Internet" that would be able to offer a wide range of new and improved services, including better security against viruses, worms, denial of service attacks and zombie computers. According to Farber and Katz (2007), the architecture of the Internet must change in order to allow for more progress and innovation, thereby increasing the value of the Internet for its customers.

These authors bring up two examples of how ISPs will suffer under network neutrality legislation. First, they argue that network neutrality regulation will negatively affect traffic management. When Internet traffic surges beyond the ability of the network to carry it, certain websites or applications are going to be delayed. However, if ISPs have control over selecting what content can and cannot be delayed, an ISP could favor a packet of information that is a patient's heart monitor over another that is delivering a music download. ISPs could also restrict harmful traffic, such as viruses, worms, or spam email (Farber & Katz, 2003). The second argument deals with pricing and service models, as certain services, such as medical monitoring, could have guaranteed delivery quality. Therefore, suppliers could be expected to charge a higher price for that premium service. According to Farber and Katz (2007), blocking premium pricing in an effort to maintain network neutrality could have the unintended effect of blocking the premium service from which customers would benefit.

Having covered the basic arguments on both sides of the network neutrality debate, I will now turn to a thematic analysis of network neutrality proposals that have taken shape around the world.

Thematic Analysis of Network Neutrality Across the Globe

While the issue of network neutrality continues to be vigorously debated, there are four distinct thematic positions (or models) that characterize the way governments across the globe have decided to look at the issue. The first model is for government mandated network neutrality through *legal regulation*. That is, governments could impose strict rules to control how ISPs lawfully manage their network traffic. The second theme is one of *transparency*, in which strict regulation of ISP network management is avoided, but replaced with requirements that ISP's provide full disclosure of their network management practices. The third theme is a *non-neutral* Internet, where the government allows for ISPs to shape the flow of traffic across its network unfettered by regulation. The final theme is *governmental control*, which demonstrates a top-down approach that allows a government (rather than ISPs) to have full network management power, as well as the ability to control information accessed through the Internet. Each is addressed in more detail below.

Legal Regulation

The model of legal regulation supposes that governmental bodies may oversee and impose rules on businesses that offer Internet services. This approach to network neutrality has been the center of much debate in the United States (U.S.) after the Federal Communications Commission (FCC) proposed rules to deal with the problem. The most contentious part of the issue has been the amount of regulatory power the government should have over free enterprise (see Blevins & Barrow, 2009).

The FCC took a regulatory approach when it adopted a policy statement affirming the principle that consumers should have access to the lawful content and applications of their choice (Federal Communications Commission, 2005). Comcast, one of the largest cable and ISPs in the U.S., sparked debate when the FCC found that it had violated the agency's policy statement (see Federal Communications Commission, 2008). Comcast had selectively blocked file transfers that used BitTorrent Inc.'s peer-to-peer (P2P) file sharing technology. On September 21, 2009, FCC chairman, Julius Genachowski also proposed a plan that would enhance transparency of network management practices, as ISP firms would be required to "make public the steps they are taking to control web traffic" (Kang, 2009).

However, the FCC's momentum towards regulation and transparency stalled in late Spring 2010, when the U.S. Court of Appeals for the D.C. Circuit Court agreed with Comcast's challenge that the FCC lacked proper authority to regulate Internet traffic and vacated the FCC's order against Comcast (*Comcast Corp. v. FCC*, 2010). The decision left the FCC scrambling for a suitable regulatory approach to ensure network neutrality.

Subsequently, the FCC has considered reclassifying ISPs as Title II communications providers under the Communications Act. Currently, ISPs are classified as Title I, or information providers, which means the FCC has very limited control over the practices of information companies as guaranteed by the First Amendment of the U.S. Constitution. However, if ISPs were classified as Title II communications companies they would be conceptualized as common carriers that transport information and/or communication for any person or company. In other words, a common carrier can offer its services to the general public under license or authority provided by a regulatory body, which has typically been granted "ministerial authority" by the legislation that created it. The regulatory body that oversees the common carrier may create, interpret, and enforce its regulations upon the common carrier with independence and finality, so long as it acts within the bounds of the enabling legislation. The idea behind telecommunication common carrier principles is similar to other transportation networks, such as the airlines, railway, and the highway system, which serve the public interest and provide transport without discrimination. As such, the common carrier service providers are immune from claiming responsibility in terms of the potential effects that the content may have on others (Bhardwaj, 2007). The FCC's reclassification proposal will face intense opposition from telecommunication companies that would be affected by the change.

Although, the network neutrality debate in the U.S. has primarily focused on appropriateness of legal regulation, lawmakers have yet to reach a consensus. However, countries outside the U.S. have taken notice. For instance, in Chile the Congress passed amendments to its General Telecommunications Law that mandates network neutrality and requires ISPs to provide detailed information about transfer speeds over their networks (Gaitonde, 2010, July 15). The amendments represent both legal regulation and transparency.

Transparency

Another approach to dealing with network neutrality is to allow ISPs to manage their networks, as they desire, but to remain transparent in their practices. Under the model of transparency, an ISP would be required to inform customers of any limitations on access, services and applications, including bandwidth caps. Additionally, ISPs must inform customers of any standards that they use to measure or shape traffic patterns in response to network congestion, and supply information on how those standards may affect service quality. Some notable countries have developed a transparency framework for dealing with network neutrality, including Canada, the United Kingdom, and the European Union.

Canada is perhaps the best exemplar in this milieu. Even though Canada has not had a governmental body pushing legislation, in July of 2009, the Canadian Association of Internet Providers, (an industry association composed of Canadian companies Rogers Communications Inc., Cybersurf, Yak, and Execulink, among others), which is affiliated with the Canadian Advanced Technology Association (a Canadian lobbyist group) attempted to get the Canadian Radio-Television and Telecommunications Commission (CRTC) to take a stand for network neutrality (Corcoran, 2009).

This proposal was prompted in part by the behavior of Bell Canada, an ISP that began deep-packet inspections of its traffic and limiting the bandwidth it allocates to certain applications at peak times (a practice known as throttling) (Geist, 2008). Bell's action prompted a formal complaint to the CRTC by the Canadian Association of Internet Providers, as well as a protest rally on Parliament Hill in May of 2008. The incident put network neutrality on the public agenda.

By fall 2010, the CRTC issued a network neutrality decision that required Canada's ISPs disclose their network management practices, including, why any practices were introduced, who will be affected, when they will occur, and how they impact a user's Internet experience (Geist, 2010). The CRTC agreed to an open door policy to address complaints about network management practices (Geist, 2010). When a consumer files a complaint to the CRTC, the ISP in question is required to describe its practices, demonstrate their necessity and establish that it discriminates as little as possible. ISPs that target specific applications or protocols may warrant further investigation (Geist, 2009).

Since the guidelines have been put in place by the CRTC, it is reported that Telus and Videotron, two of Canada's ISPs, do not have explicit network management practice disclosures available, but neither company is known to utilize traffic shaping technologies (Geist, 2010). Of the four remaining Canadian providers, none make it easy to find disclosures (including Bell and Rogers), and two others (Shaw and Cogeco) may not be compliant with CRTC requirements (Geist, 2010). This suggests that there are some flaws in the transparency model without strong government oversight.

Similar to Canada, in there has been public discourse in the United Kingdom (UK) about the potential for Internet regulation (Raff, 2009). Although, the UK is aware of network neutrality principles, it has focused concern on "search neutrality" as Internet search engines have no editorial policies other than the idea that search results be comprehensive, impartial, and based solely on search relevance (Raff, 2009). Proponents of search neutrality are particularly concerned about Google's control of 90% of the UK search market, and argue that without search neutrality legislation, companies such as Google could enact preferential search treatment by promoting its own services at or near the top of a results page, bypassing algorithms it would

use to rank the services of others (Raff, 2009). In the UK, Google has effectively stomped out its competitors such as MapQuest, Tom Tom, and Rightmove; Great Britain's leading real-estate portal which lost ten percent market value at the rumor that Google planned to launch a real estate service in the UK (Raff, 2009).

However, in March of 2010, UK's regulator Ofcom proposed a plan to study how broadband providers manage Internet traffic over their networks to crack down on potentially anti-competitive behavior and bring greater transparency to the market. Realizing that as more and more people in the UK subscribe to broadband Internet, strains on the network may lead ISPs to favor content providers over others (Clark, 2010). The fear of anti-competitive behavior in the UK comes after two of its ISPs demonstrated questionable practices. O2 attempted to charge Google for use of its network, and stopped offering unlimited data plans to its customers. Another British ISP, BT, attempted to charge the BBC for use of its network, arguing that it could no longer subsidize the cost of streaming BBC videos online.

In the end however, the UK is not in support of the U.S. model of governmental legal regulation over ISPs, but rather focuses on the idea of transparency. Ofcom has opened up the issue for public comment, making customers aware of policy, and plans to open discussion about traffic management practices. Ofcom plans on using European Union (EU) policy as a guide, and its decision is expected to become law by 2011 (Clark, 2010).

In the EU, the issue of network neutrality was at first dismissed as an "American problem", but conversations about Internet regulation have begun (Mardsen, 2007). European lawmakers become inundated with lobbyists from U.S. companies, such as AT&T and Verizon who are against network neutrality, and Google and Yahoo! who have supported neutrality principles (O'Brien, 2009). As a result, policy proposals have tended toward a transparency model, rather than a legal regulatory one. Primarily, the debate in Europe has centered mostly on role unbundling or *mandated network sharing* in order to keep networks neutral (Wallsten & Hausladen, 2009). Proponents of unbundling argue that if the infrastructure provider does not offer retail services, or is only one of many retailers offering service over its infrastructure, it will have less incentive to discriminate in favor of, or against, particular content (Wallsten & Hausladen, 2009).

Although the topic of network neutrality was discussed in the European Parliament on April 22nd, 2009, the European Parliament was not as fierce as in the U.S., mainly because (unlike the US, which has only a handful of ISPs) Europe has over 200 network operators, and there is little perceived danger that one operator could filter Internet traffic for commercial (O'Brien, 2009). On September 23, 2009, the EU did pass a Telecommunications Reform Package, which promotes a competitive broadband market without network neutrality regulation as legislators argued that the EU's competitive environment would protect Internet users better than network neutrality regulations (Marshall, 2009). The European approach offers neither an absolute ban on price discrimination, nor an absolute prohibition of regulatory oversight. The EU model avoids any comprehensive regulation that could stifle the innovation, opting instead for enhanced transparency and a competitive market.

Regardless of the EU's official stance on the issue, a number of European countries have different perspectives on network neutrality. For instance, Denmark has adopted a clear network neutrality stance with the Dutch Parliament's 2006 decision to require cable companies to open their networks to competitors under the belief that vertical integration of content and distribution would harm customers (Wallsten & Hausladen, 2007). However, Denmark is less favorable to network neutrality in terms of preventing discrimination based on the type of application. For

example, in January of 2008, the Danish court ruled in favor of the International Federation of the Phonographic Industry when it ordered Tele-2 (a Danish ISP) to prevent its subscribers from accessing a file sharing site that was accused of facilitating illegal downloads (Wallsten & Hausladen, 2007).

Non-Neutral Internet

Another model or practice in network neutrality is to allow for an open, but non-neutral Internet. Essentially, under this philosophy, ISPs are allowed to manage network traffic, as they deem appropriate. Japan and South Korea allow their ISPs to operate freely without fears of anti-competitive behavior or discriminatory practices. In Japan broadband service is much faster and less expensive that the U.S., which allows users to watch broadcast-quality television in full screen over the Internet (Harden, 2007).

Ironically, perhaps, Japan has produced a variety of reports on the issue of network neutrality, and in May 2008, four of its associations of telecommunications providers came out with specific "guidelines for packet shaping", which emphasized packet shaping used only in exceptional circumstances, such as network expansion, or higher bandwidth demand (Wallsten & Hausladen, 2007). It is interesting that despite its current high broadband capacity, Japan is looking ahead to strategies that address the need to relieve network congestion without promoting anti-competitive behavior.

Like Japan, South Korea also has a well-developed broadband infrastructure that allows service providers to manage their networks in ways the U.S. might consider a violation of network neutrality principles (Wallsten & Hausladen, 2007). Currently, South Korea only allows authorized companies to provide voice-over-Internet-protocol (VoIP) service under the Korean Telecommunications and Business Act (Wallsten & Hausladen, 2007).

Governmental Control

The governmental control model assumes the government has complete control of all aspects of the Internet, including who is allowed access, what content is accessible, and the rate of delivery of that content. Currently, China and Australia are two countries of note that subscribe to this model. China is, perhaps, the most controlling of Internet content and service of any country across the globe and is not in support of network neutrality. China sensors traditional print press, domestic and foreign Internet sites, cell phone text messages, social networking services, chatrooms, emails, blogs, films, and online games as well as blocks any messages critical of the government as a "guide to public opinion" (Wines, LaFraniere & Ansfield, 2010).

Access to the Internet in China from the outside world is limited and all Internet traffic in China must pass through one of three large computer centers in Beijing, Shanghai, and Guangzhou. This system, known as the "Great Firewall" is a system of government computers that intercept inbound data and compare it with a constantly changing list of forbidden keywords or web addresses, and whenever a match occurs, the computers block (Wines et al, 2010). This practice has been in place since 2005 and seems unlikely to change.

Australia may also favor full governmental control as an Internet traffic mangement model. In April 2010, a proposal came forth in Australia to place restrictions on web content, which would make Australia one of the strictest Internet regulators of the worlds' democracies (McGuirk, 2010, March 29). The U.S. State Department raised concerns over Australia's

proposals, along U.S. media companies Google and Yahoo!. Australian Communications Minister Stephen Corroy argued that Internet filters would block access to child pornography, sexual violence, and instructional guides for criminal activity, arguing that the Internet is "not so special" that regulation is unwarranted (McGuirk, 2010, March 29).

Several other countries enact some form of government control over Internet content. According to a survey that examined Internet censorship filtering behaviors among 40 countries across the globe, Internet censorship often surrounds themes such as politics, human rights, sexuality, or religion (Carvajal, 2007). In addition to China, discussed earlier, filtering was found to be a regular practice in Iran, Saudi Arabia, Syria, Tunisia, Vietnam, Uzbekistan, Oman and Pakistan; although the type of objectionable content filtered in each country varied (Carvajal, 2007).

Conclusion

Overall, the debate over network neutrality appears to be the most contentions in the U.S., where a final policy resolution seems less certain. Meanwhile, network management policies in Canada, Japan, and the European Union look more resolute. However, the language each country uses, and its implementation differs dramatically across international borders, as does the online infrastructure internationally. Proponents of network neutrality argue that a complete and open Internet is necessary and that ISPs should not be able to discriminate or route traffic based upon content or content categories. ISPs argue that regulation detracts from their abilities to compete in the marketplace. This issue has raised attention across the globe, and a variety of approaches have been used to deal with the issue, however, no country seems to be as determined to keep the discussion going as in the United States. That is not to say that there are not smaller countries taking note. For instance, in 2008 Singapore held a network neutrality forum to raise interest on the issue since a decision in the United States has the potential to affect Singapore (Yan Min, 2008) and Malaysia has been committed to network neutrality and against Internet censorship since the passage of the 1998 Communication and Multimedia Act.

In time, the issue of network neutrality will need to be addressed at an international level, as the range of policies employed within nation states are disparate, ranging from industry self-regulation of its networks all the way to government regulation of the networks. An upside to the variety of policy approaches is that there is ample opportunity to observe the consequences of the each model, and perhaps, find one that best facilitates a free and open Internet, encourages competition, and does not discriminate against lawful content and services. Towards that end, perhaps, the U.S. should take note of the transparency model used in Canada. Telecommunications companies in the U.S. have chafed at potential government interference into free enterprise as the FCC continues to put forth regulatory proposals. Yet, in Canada, it was the telecommunications industry that sought government involvement to mitigate the discriminatory practices of one of its largest ISPs. However, the ultimate solution did not involve omnibus regulation, but a transparency regime with minimal government oversight. Such a mix of government supervision and industry self-regulation would likely have considerable appeal in a country that cherishes free enterprise.

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Citing this policy review:

Stover, Christine M. (2010). Network neutrality: A thematic analysis of policy perspectives across the globe [Review of four Internet traffic management policies *legal regulation*, *transparency*, *non-neutrality*, and *government control*]. *Global Media Journal* -- *Canadian Edition*, 3(1), 75-86.