Net Neutrality

Introduction

Net neutrality is a term first used in print by Tim Wu in his 2003 article "Net Neutrality, Broadband Discrimination."[1] Wu espoused the principle that all Internet traffic should be treated equally, which is to say that internet service providers (ISPs) are morally obligated to furnish access to all sites without any preference regarding content or speed. Strict net neutrality would prohibit Internet service providers (ISPs) "from speeding up, slowing down or blocking Internet traffic based on its source, ownership or destination."[2] For various reasons that will become clear in the course of this chapter, strict net neutrality does not, and should not exist. Indeed, there currently exists no generally accepted definition of network neutrality.[3] Nevertheless, the somewhat open concept of net neutrality is an important one, inasmuch as it is the focus of ethical questions concerning the management of Internet traffic. Thus, for example, Belli and De Philippi take network neutrality as requiring that "Internet traffic be treated in a non-discriminatory fashion so that Internet users can freely choose online content, applications, services and devices without being influenced by discriminatory delivery of Internet traffic."[4] The concept of net neutrality serves therefore to point us to important values that we feel the need to protect and nourish in how the Internet is allowed to develop.

What is the Internet?

The Origins of the Internet

The Internet was started in the 1960s as a closed research network designed to transmit text messages between participating universities.[5] It was set up such that messages were delivered autonomously, as fast as possible, through 'dumb pipes', i.e. channels of transmission

that were neutral as regards the information they carried or the use for which that information was to be used. These two priorities, namely that the carrier of the information in no way influences the information it carries (the end-to-end principle) and that the delivery of the information be as fast as possible (the best effort principle) continue to inform the concept of what it is for the Internet to be 'open.'

In the very earliest days of the Internet when all that was being transmitted was text messages which did not need to be prioritized it was possible to have what I earlier described as strict net neutrality, i.e. all transmitted information being transmitted on a first in-first out principle. Very quickly, however, the development of the Internet required that other important considerations be brought to bear. For example, once voice or video transmission takes place over the Internet the issue of Quality of Service (QoS) becomes especially critical. There must be reliable transmission of information that is time critical (low latency) and received at a steady rate (low jitter). Quality of Service concerns led in 1983 to the Internet adopting Transmission Control Protocol/Internet Protocol (TCPIP) in 1993.[6] Any discussion of net neutrality must, therefore, take into consideration how different QoS requirements affect the delivery of information. It must also take into consideration that there has been a steady commercialization of the Internet since the 1990s.[7]

Four Layers of the Internet

It is fair to describe the Internet as the network of networks. The overarching network we call the Internet can be understood as a multi-layered infrastructure consisting of four main layers relevant to the concept of net neutrality.[8]

The first layer is the physical infrastructure that makes the Internet possible. This is the connectivity layer in which the stakeholders are telecom corporations, cable, and broadband companies, whether these be privately or publicly owned. The second layer is an applications layer that enables the physical infrastructure to provide useable services such as email and web browsers. The stakeholders in this layer are software companies, developers and web architects. The third layer, known as the 'logical' or 'content' layer contains various Internet protocols such as TCP/IP and HTTP and provides content; the stakeholders being multimedia industries and new agencies. The fourth layer concerns the delivery of the content, with the stakeholders being the end users of that content.

Ethical Challenges Involving Traffic Management

Commitment to net neutrality invariably raises major challenges regarding traffic management. The following four are especially noteworthy.[9]

1. Mitigation of congestion (e.g. downgrading peer-to-peer traffic to secure quality of service for other types of connections).

2. Prohibition of access to specific content (e.g. due to legal obligations).

3. Differentiation of services to end-users including consumers and application providers (e.g. different services have a different quality).

4. Protection of an Internet Service Provider's' (ISP) business interests (e.g. prioritization of an IAP's own internal call service.

Ethical Challenges and the Mitigation of Congestion

With the commercialization of the Internet that began in the 1990s, ethical questions surrounding the issue of mitigating congestion have arisen. Sandvine's 2019 Global Internet

Report records that over 60% of downstream internet traffic is video streaming,[10] and its 2020

Mobile Internet Phenomena Report notes that 65% of mobile downstream traffic is video.[11]

Techniques of traffic shaping exist, controlling, for example, the volume of information sent

into a network in a specific time period (bandwidth throttling) or the maximum rate at which

information can be sent, but such techniques inevitably raise ethical questions regarding

prioritization.

In Canada, the Canadian Radio-television and Telecommunications Commission (CRTC)

addresses the issue of prioritization in its Telecom Regulatory Policy CRTC 2009-657.[12] It

"acknowledges that some traffic management is required to address congestion in order to

ensure that all end-users receive acceptable Internet service."[13] Internet Service Providers

(ISPs) are allowed to develop Internet Traffic Management Practices (ITMPs) in order to address

traffic congestion and protect themselves against security threats such as malicious software.

The CRTC held, however, that "given the varied and evolving nature of networks,

services being offered, and user needs . . . it would not be appropriate to create bright-line

rules as to which types of ITMPs are acceptable."[14] It went on to say that application-specific

ITMPs which degrade or prefer one application, class of application, or protocol over another,

may warrant investigation, but that economic ITMPs would generally not be considered

unjustly discriminatory, as they link rates for Internet service to end-user consumption.[15]

The CRTC requires that ISPs make their ITMPs available to customers. In responding to a

complaint regarding its practices, the ISP must use its ITMP framework. In doing so, the ISP is

required to:

1. Describe the ITMP being employed, in terms of its need, purpose, effect, and whether it results in discrimination or preference.

2. If its ITMP results in any degree of discrimination or preference then the ISP must:

    (a) demonstrate that the ITMP is designed to address the need and achieve the purpose and effect in question, and nothing else;

    (b) establish that the ITMP results in discrimination or preference as little as reasonably possible;

    (c) demonstrate that any harm to a secondary ISP, end-user, or any other person is as little as reasonably possible; and

    (d) explain why, in the case of a technical ITMP, network investment or economic approaches alone would not reasonably address the need and effectively achieve the same purpose as the ITMP.

Ethical Challenges and Prohibiting Access to Content

Prohibiting or restricting access to content has obvious ethical implications as regards the neutrality or openness of the Internet. Internet Service Providers have a *prima facie* ethical duty, to obey the laws of the country in which they operate. I say *prima facie*[16] because laws may or may not be in accordance with what is genuinely ethical. A law which makes it illegal for an ISP to provide child pornography and mandates the reporting of Internet child pornography is ethically justified and cannot be viewed as any kind of serious threat to net neutrality.[17] On the other hand, laws imposed by an authoritarian regime blocking access to a wide range of websites considered 'dangerous' by the regime cannot be considered ethically justified and thus not in accordance with a neutral, open, Internet.

Further than their *prima facie* duty to obey the law, ISPs have a moral duty to go beyond their legal obligations. A genuinely open Internet will foster freedom of expression. As in the case of child pornography, freedom of expression does not entail the right, regardless of the consequences, to say or view whatever one wants. It does, however, require that one not be unduly censured for expressing opinions that may not be popular. ISP have, therefore, an ethical duty to remain impartial in dealing with information that does not directly cause harm to others.

Ethical Challenges and the Differentiation of Services

Debates concerning net neutrality invariably focus on the potential consequences of Internet Service Providers exercising control of network traffic. As we have seen, techniques of differentiating types of traffic are already used by ISPs. What is mainly at issue is the degree to which ISPs should use these techniques to generate extra revenue.

In economic terms, ISPs are the operators of a two-sided market platform connecting content and service providers (CSPs) with consumers, namely Internet users (IUs). Most of an ISP's revenue must come from the fees they charge to Internet users (IUs).[18] ISPs often operate in a flat rate environment, in which their investments in network infrastructure tend to outweigh any increase in revenues. Consequently, ISPs argue they should be allowed to use traffic management mechanisms to create tiered traffic streams for which Internet users are charged different fees.

The creation of such streams does not in itself threaten the openness of the Internet, inasmuch as it does not appear unfair that those who consume the most data and require the highest quality of service should pay more than others who consume less data and do not

require as high a quality of service. Thus, for example, it does not seem unreasonable that access to certain websites or services would not be included in a selected Internet access package, whereas they would be included in a more expensive package.[19] Currently, such tiering is achieved by offering Internet access with different bandwidth. This type of capacity-based discrimination is in line with net neutrality, inasmuch as no specific traffic is prioritized or degraded.[20]

Ethical Challenges and the Protection of Business Interests

In the previous section, I have argued that the creation of tiered streams need not threaten the concept of net neutrality. What would constitute threats to net neutrality is if ISPs use traffic management techniques in such a way as to 1) prioritize affiliated content, or degrade or block content harmful to the ISP's other revenue streams, or 2) avoid or limit traffic that they view as generating nothing but costs.

The first threat arises when ISPs are vertically integrated with a large content service provider. In the United States, for example, there are ISPs integrated with companies such as Comcast and NBC Universal, though there are no known actual cases where these companies have prioritized their own content.[21] There are, however, cases where ISPs have blocked voice over IP (VOIP) traffic which was in competition with their regular telephone services.[22]

The second threat arises when ISPs carry traffic that generates nothing but costs. Thus, for example, peer-to-peer traffic amounts to a large proportion of Internet traffic, but because it is generated and consumed by end users, ISPs cannot profit from it. It is not uncommon for ISPs to 'manage' P2P and related traffic, even during times when Internet traffic was not at its peak and congestion not therefore a problem.

These two types of manipulation are ethically problematic. It is for this reason that proponents of net neutrality want clear regulation on how traffic management techniques are used by ISPs.

How Should Net Neutrality Be Conceived?

Neutrality and Justice

We have seen that strict net neutrality, i.e. that all data, no matter its relative importance or type, be processed on the first-in-first-out principle with no intermediate control ever exercised, is neither possible nor desirable. How then should net neutrality be understood? In line with Johan Rochel, I suggest that 'net neutrality' should be understood in the context of attempting to ensure that the Internet is just, in the sense that the conflicting interests of users and providers be addressed in fair ways. The fundamental value to be pursued is not neutrality but rather justice.[23]

In this context it is important to note that, although in some cases neutrality is the best way to ensure justice is done, this is not always the case since there are situations where actions can be neutral but unjust. In our discussion we have already seen this is the case. We have noted that quality of service (QoS) requirements for applications such as video transmission are not consistent with the neutrality principle of first-in-first-out. We have also noted that accepting a neutrality principle of insisting that ISPs never differentiate between the type of data they carry would be inconsistent with their moral and legal obligation to avoid carrying child pornography. The issue, therefore, is "to identify and map the different values which are served by 'neutrality' in the context of a broader search for justice."[24]

Human Dignity, Equal Treatment, and a Just Internet

Human beings have moral worth. Recognizing human dignity requires at the very least taking steps to protect the ability of individuals to exercise freedom, i.e. self-determination. Part of this recognition involves ensuring that individuals are treated equally in the sense that individuals in similar situations are treated in a similar way. Thus, for example, if I have two students each hand in a paper of comparable quality it would be unjust of me to award one student a C and the other an A. Assuming there were not good reasons to differentiate my grading, e.g. one paper was handed in late and the other was not, then justice requires that I give both papers the same grade. Neutrality furthers justice to the degree that it protects human dignity by requiring that individuals in similar circumstances be treated in non-arbitrary ways.

Calls for 'net neutrality' are, therefore, best understood as the expressing ethical concerns that the Internet be just in its operation. At a practical level this involves examining how traffic is managed by ISPs. This does not mean that Internet traffic should not be managed, but rather that it be managed in such a way as to respect and promote the interests of all who participate in it. Recognizing that the interests of participants conflict, e.g. ISPs wish to maximize profit, whereas consumers wish to minimize costs, we must nevertheless strive to balance those interests in such a way that all are treated fairly.

Net Neutrality and Royalty Fees

Society of Composers, Authors and Music Publishers of Canada versus Canadian Association of Internet Providers, 2004 SCC (CanLii), [2004] 2 SCR 427

Citation*: Society of Composers, Authors and Music Publishers of Canada v. Canadian Assn. of Internet Providers, 2004 SCC 45 (CanLII), [2004] 2 SCR 427,* <http://canlii.ca/t/1hddf>

This Supreme Court of Canada case addressed the question of whether Internet Service Providers (ISPs) have an obligation to compensate musical composers and artists for their

Canadian copyright in music downloaded in Canada from a foreign country via the Internet. The Society of Composers, Authors and Music Publishers of Canada wanted to collect royalties from Canadian ISPs, arguing that they infringe the copyright owner's exclusive legal right to communicate the work to the public by telecommunication and to authorize such communication. In response, the Canadian Association of Internet Providers argued that they neither communicate nor authorize anyone to communicate musical works because they are simply a conduit, i.e. a 'dumb pipe' and do not regulate the content of the Internet communications which they transmit.

In 1995, the Copyright Board held that copyright liability applies to content providers but that the normal activities of ISPs other than content providers fall under the protection of the **Copyright Act** **s. 2.4(1)**(b), which states that persons who only supply "the means of telecommunication necessary for another person to so communicate" are not themselves to be considered parties to an infringing communication. In enacting this provision, Canadian Parliament distinguished between those who use the Internet to supply or obtain content such as 'cheap music' and those who are part of the infrastructure of the Internet. So long as an ISP does not itself engage in actions that involve the content of the communication and confines itself simply to providing a pipe for the transferal of information then it is protected.

An ISP cannot claim immunity from copyright liability on the grounds that its host server is outside the country. On the other hand, a host server cannot be held liable simply on the grounds that it is in Canada. Rather, the liability of a host server is determined by whether it limits itself to being only a conduit, i.e. is content neutral. An ISP's knowledge that someone might be using content-neutral technology to violate copyright is not enough to make it liable.

An issue came to the fore when ISPs increasingly used 'caching' to facilitate ease and

speed of transmission. When packets of data pass through the conduit of an ISP, a temporary

copy, i.e. 'cache', can be made and stored on its server. Such 'caches' speed up transmission

and lowers costs. They are not retained for long periods of time since, if the original files

changes, users would get out-of-date information.

SOCAN, an organization representing Canadian composers, authors, and music

publishers, as well as foreign composers, authors, and music publishers challenged the

Copyright Board's decision that the practice of 'caching' by ISPs did not violate copyright. A

Federal Court upheld this decision, but the Supreme Court sided with the Copyright Board.

[1] Wu, Tim. "Net Neutrality, Broadband Discrimination." *Journal on Telecommunications and High Technology Law.* Vol. 2, 2003, 141-175.

[2] Krämer, Jan, Wiewiorra, Lukas, Weinhardt, Christof "Net neutrality: A Progress Report" *Telecommunications Policy*, Vol. 37, 2013, 794-813, 796.

[3] Ibid.

[4] Belli, L., De Filippi, P. *Net Neutrality Compendium*. (Cham: Springer, 2016), 2.

[5] Krämer, Jan, Wiewiorra, Lukas, Weinhardt, Christof, 794.

[6] Ibid. 795

[7] Ibid.

[8] Rochel, Johan. "Towards a Just Internet: A Republican Net Neutrality." 297-320 in Stückelberger, Christof/Duggal, Pavan. *Cyber Ethics 4.0*. (Geneva Switzerland: Globethics, 2008), 298.

[9] Ibid., 299.

[10] https://www.sandvine.com/press-releases/sandvine-releases-2019-global-internet-phenomena-report

[11] https://www.sandvine.com/phenomena

[12] https://crtc.gc.ca/eng/archive/2009/2009-657.htm

[13] Ibid.

[14] Ibid.

[15] Ibid.

[16] The term '*prima facie*' describes a claim which should be accepted until shown otherwise.

[17] See, for example, https://laws-lois.justice.gc.ca/eng/acts/I-20.7/page-1.html

[18] For an explanation of why this must be the case see Krämer, Jan, Wiewiorra, Lukas, Weinhardt, Christof, 797.

[19] It should be noted, however, that, given a fixed a amount of bandwidth, speeding up some Internet traffic will necessarily lead to slowing down other Internet traffic. Ibid. 798.

[20] Ibid. 799.

[21] Ibid. 798.

[22] Ibid.

[23] Rochel, Johan. "Towards a Just Internet: A Republican Net Neutrality," 301.

[24] Ibid. 304