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Observing Network Neutrality

The Legal Challenges of a "Digital Ecology"

Network neutrality is a controversial telecommunication policy issue throughout the democratic world. The article doubts the contention of Reidenberg that a "Lex Informatica" is derived from technical constraints. Moreover it shows that there is no observer-independent technical rule that can claim validity comparable to a natural law.

Furthermore the article analyses the metaphor of a "digital ecology" which is often used in connection with the network neutrality debate. It shows that this metaphor does not describe the issue of network neutrality in a vast majority of contexts. With its implied comparison to the environment it may be misleading in certain contexts.

1 Introduction

Network neutrality has become a most controversial telecommunication policy issue within a rather short period of time. While it is too early to tell whether network neutrality "may well be the telecommunication policy issue of the 21st Century"[1] or even become the "new paradigm of Internet regulation"[2], the topic has generated a large body of literature and a heated discussion among researchers, policymakers and stakeholders. The fact that network neutrality has remained a diffuse, yet powerful idea rather than a well-defined concept reflects the difficulty to reduce it to a technical, economical, legal or political issue alone. As a result, arguments for and against network discrimination appear in many shapes and forms. Sometimes the debate is framed in terms of public and private interests[3], in balancing openness and control[4], market efficiency[5], competition and innovation[6]. Sometimes it is framed in terms of freedom of speech or censorship[7]. Some authors focus more narrowly on domestic broadband access policies; others stress the importance of globally applicable

[1] Blevins, Jeffrey Layne; Shade, Leslie Regan (2010): International Perspectives on Network Neutrality. Exploring the Politics of Internet
Traffic Management and Policy Implications for Canada and the U.S. In Global Media Journal - Canadian Edition 3 (1), pp. 1–8.
[2] Powell, Alison (2009): Lessons from the Net Neutrality lobby: Balancing openness and control in a networked society.
Paper held at WebSci'09: Society On-Line, 18-20 March 2009. Athens, Greece, 2009. Available online at http://journal.webscience.org/130/.
[3] Barratt, Neil; Shade, Leslie Regan (2007): Net Neutrality: Telecom Policy and the Public Interest. In Canadian Journal of Communication (32), pp. 295–305.
[4] Powell 2009, see fn. 2.
[5] Economides, Nicolas (2010): Why Imposing New Tolls on Third-Party Content and Applications Threatens Innovation and will not Improve Broadband Providers' Investment. NYU Center for Law, Economics and Organization (Law & Economics Research Paper Series,
Working Paper No. 10-32). Available online at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1627347.
[6] van Schewick, Barbara (2010): Internet architecture and innovation. Cambridge, MA: The MIT Press.
[7] Balkin, Jack M. (2008): Media Access: A Question of Design. In George Washington Law Review 76 (4), pp. 101–118.
[8] Mueller, Milton (2007): Net Neutrality as Global Principle for Internet Governance (Internet Governance Project, Paper IGP07-003).
Available online at http://internetgovernance.org/pdf/NetNeutralityGlobalPrinciple.pdf.

principles[8]. To many, the debate is closely linked to current developments in Internet technology. But others remind that similar controversies over common carriage have existed for centuries[9].

2 At first glance, network neutrality seems to be a purely technical issue to be dealt with by network engineers. But the recent years have shown that instead of reaching some form of approximation, agreement or consensus, the fronts between proponents and opponents of traffic discrimination have hardened. At one end of the spectrum, telecommunications companies (Telcos) insist that without a significant change in the Internet's architecture, the economic incentives to deploy costly fiber-optic infrastructure will not be met. This is a serious threat towards governments who already struggle to fulfil their national broadband plans. At the other end of the spectrum, network neutrality proponents argue that the Internet is a global commons and that network neutrality should become a normative principle or a fundamental right. And regulators are caught in the middle and have for the most part failed to establish collectively binding decisions.

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3 Rather than trying to pinpoint the essence of network neutrality and arguing for or against data or network discrimination, in this paper I suggest to employ second-order cybernetics and to observe the observer. Second-order cybernetics or the 'cybernetics of cybernetics' investigates cybernetics (and cybernetic models) with awareness that the investigator is also part of the system. The ontological subject/object distinction that is still implicit in most conventional cybernetic models on Internet regulation is replaced by the system/environment distinction. Therefore, I regard network neutrality as a debate about the social conditions and settings under which network discrimination is deemed adequate. This leads to questions about how conflicting ideas about adequate practices of data (non-) discrimination develop, diffuse and consolidate and in how far the legal system is capable of managing or 'taming' the various rationalities that come into play. The underlying assumption is that modern society is differentiated into autonomous social systems[10], that the specialization and blindness of these systems spurs ecological risks[11], and that the global law is in itself differentiated or fragmented into transnational legal regimes[12].

4 I will begin by presenting five theses about the network neutrality controversy and then turn to the implications for the legal system.

5 **1. The network neutrality controversy reveals future uncertainties about a 'sustainable' Internet infrastructure**

Technologies and communication media in particular have the tendency to become invisible when they perform as expected. The Internet has been some kind of exception in this regard – it somehow fascinates for its own sake. Still, growing concerns about its sustainability come handy to the social scientist as taken-for-granted 'technical design principles' come under pressure: they become observable as decisions and therefore as being contingent, especially in situations where things do not go well.

[9] Sandvig, Christian (2007): Network neutrality is the new common carriage. In Info: The Journal of Policy, Regulation, and Strategy 9 (2/3), pp. 136–147.
[10] Luhmann, Niklas (1971): Die Weltgesellschaft. Archiv für Rechts und Sozialphilosophie 21. Reprinted in Luhmann, Niklas (1986): Soziologische Aufklärung Vol. 2.: Aufsätze zur Theorie der Gesellschaft (3rd ed.), pp. 51-63.
[11] Luhmann, Niklas (1989): Ecological communication. Chicago: University of Chicago Press.
[12] Fischer-Lescano, Andreas/Teubner, Gunther (2004): Regime-Collisions: The Vain Search for Legal Unity in the Fragmentation of Global Law. Michigan Journal of International Law, Vol. 25, No. 4, 2004, pp. 999-1046.

6 *"The definitive character of descriptions of technology, normally unremarked upon, becomes most apparent when things go wrong, or when technology operates against expectation, or when its effects contrast markedly with what has been claimed for."*[13]

7 The network neutrality debate is strongly related to questions regarding how and why the Internet actually works, how well it performs and which steps are necessary to ensure its sustainability for the future. While there is a widespread consensus that the Internet has proven to scale and adapt quite nicely to emerging demands in the past, the big question is whether it will continue to do so in the future. There is a concern that problems and risks attributed to the Internet are getting worse while society's dependence on it is deepening. In other words, the Internet might not 'scale nicely' along societal needs, and the network's simple core architecture might lead to a dead end at some point, as design changes happen only incremental and usually take place at the edge of the network only[14]. Supporters of an incrementalist approach argue that the Internet's current core protocols should remain largely untouched as they have guaranteed the networks' openness to innovation in the past[15]. Advocates of a clean-slate approach maintain that developing future-proof next-generation-networks (NGNs) demands overcoming the Internet's traditional limitations and its 'ossified' core design. Examinations of the past show that the core Internet protocols have not changed significantly since 1993[16]. But the question whether this should be regarded as an argument for or against a radical change remains open. The perception that the future of the Internet depends on decisions made in the present (or, if already made, on past decisions that have not been revised) is key to understanding the heat of the controversy. One of the key questions in this context is whether and for which purposes the network design should facilitate the discrimination of traffic or content. Discrimination could take place at different places and layers of the network and could be subject to different distinctions (e.g. lawful/unlawful, important/unimportant, benign/malicious, valuable/valueless).

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8 A (simplistic) analogy may help to understand the impacts of such discrimination. The way in which the postal service delivers cargo (e.g. a letter, a parcel) shows some similarities regarding the way data packets (the basic units of data in a transport stream) are delivered by the Internet. Let us imagine three simple models of a postal network: in the first model, the service operator is expected to deliver a letter to its final destination as long as the postage is paid for, no matter what its content is. In other words: the service operator must not discriminate between the content he handles. A love letter is delivered with the same speed and care as an advertising mail. The service operator has no possibility to discriminate between both since he may not open the envelope; and he does not need to, as the postage depends on weight only. This model indicates a "neutral" or "dumb" infrastructure. In the second model, there are certain situations in which neutrality might be violated. The service operator may introduce further measures of price discrimination (priority mail, insurance). He is still not allowed to open any envelopes, as he can discriminate service levels by the priority mail stamp. But the cargo might be intercepted - usually by a third party - if it is regarded as harmful or unlawful by a heuristic analysis of the envelope. The postal network is not neutral anymore, but it does not discriminate upon content. In the third model, the service operator may use any information that is available either from the envelope or from the content itself in order to optimise the network performance towards a specific goal (capacity utilisation, security, profit). For the customers, the outcome is a mixed blessing: some love letters get priority and some advertising mails

[13] Woolgar, Steve (Ed.) (2002): Virtual society? Technology, cyberbole, reality. Oxford, New York: Oxford University Press, here p. 7.
[14] Talbot, David (2006): The Internet Is Broken. Technology Review Dec. 2005 / Jan. 2006. Available online at http://www.technologyreview.com/article/16356/.
[15] van Schewick, Barbara (2010): Internet architecture and innovation. Cambridge, MA: The MIT Press.
[16] Handley, Mark (2006): Why the Internet Only Just Works. In BT Technology Journal 24 (3), pp. 119–129.

get sorted out, but ultimately the question of how fast mail gets delivered (or if it gets delivered at all) depends upon the service operator's agreements with both the sender and the recipient: the network is now, much to the delight of the service operator, dealing with a two-sided market; it has become a "smart" infrastructure.

9 **2. Reasonable network management is not a new topic, but it gains momentum due to media convergence towards IP technology**

If the Internet has been around us for decades, why took it so long for the network neutrality debate to become obvious? The End-to-End argument was formulated as early as 1984[17], and the Internet popularity boom took place around 1995. One answer that is usually accepted by both network neutrality proponents and opponents is media convergence. Media convergence refers to the tendency of previously separated services to converge into a single technology. In the case of digital information technology, the most encompassing technology today is the Internet Protocol (IP). Telephony, television and data services are migrating into a single 'big pipe', the Internet. While this convergence is synergistically creating new efficiencies, it also brings new challenges with it: video streaming requires large amounts of bandwidth, while telephony requires low latency (delay) and low jitter (unpredictable changes in delay). Channelling services with varying requirements into a single pipe, and, most importantly, making them 'play nice' together, requires a sophisticated network management. As more and more services are migrating to Internet technology, it becomes obvious that the Internet protocols, which have been designed decades ago, struggle to deliver the connection quality necessary for some bandwidth- and time-critical applications.

10 *"[The Internet] basically provides 80% of the capability for 20% of the cost. If we wanted 100% of the functionality, so that telesurgery routinely could be performed over the Internet with very low risk, then it is highly likely that the network would be too expensive for the vast majority of users who wish to exchange e-mail, chat, or surf the Web."*[18]

11 Media convergence also implies that formerly clear-cut value chains are being put into question. For Telcos, the telephony business model – traditionally the most profitable one – is falling apart due to VoIP technology, degrading network operators to 'bit-pushers' in a commodity market. From their point of view, service and content providers find new business niches and invade their value chain like parasites. Whereas under the old regime there was a clear-cut role separation within the market, Telcos are now forced to realign their strategies, and access-tiering is their preferred way of "fixing the Internet value chain"[19].

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12 **3. No matter how good our (cybernetic) models are, there is no observer-independent 'technical core' to be found**

With reference to code, protocol and architecture, social scientists have developed a vocabulary which happens to align with an engineering perspective on technology. A major impetus for legal academics to not only consider the social, but also the socio-legal effects of information and communication technology has been Reidenberg's argument that the creation and implementation of information policy are embedded in network designs and standards, and that rules for information flows imposed by

[17] Saltzer, J. H.; Reed, D.P; Clark, D.D (1984): End-To-End Arguments in System Design. In AC M Transactions on Computer Systems 2 (4), pp. 277–288.
[18] Handley, Mark (2006): Why the Internet Only Just Works. In BT Technology Journal 24 (3), pp. 119–129, here p. 128.
[19] ATKearney (2010): A Viable Future Model for the Internet. Available online at http://www.atkearney.com/images/global/pdf/Viable_Future_Model_for_Internet.pdf.

technology and communication networks form a 'Lex Informatica'[20] that policymakers must understand. Lawrence Lessig's famous formula that 'code is law'[21] is another example.

13 Research on its regulation is often framed in terms of (legal, political, social) constraints both to and from technology. Technical design principles seem to provide some incontestable truth in times of uncertainty and conflict. Many theories concerned with Internet regulation therefore aspire to develop adequate models of the regulatory environment in order to design "effective" regulatory interventions. One – often implicit – assumption is that social interaction is based on consensus and shared knowledge, while deviation from 'true knowledge' comes in the shape of interest-driven ideology. But the view that we simply need more and better information has some major problems. Information alone cannot resolve value conflicts. Controversies about industrial technologies and environmental hazards have – especially after the accidents at Bhopal and Chernobyl in 1984 and 1986 – led to a widespread concern about complex industrial technology. In a similar way, the 'blessings' of biomedical products have been challenged after the Thalidomide tragedy. In all of these cases, efforts to explain the technical details behind these technologies have not led to consensus, but further stirred up the debate. As the network neutrality controversy shows, we are dealing with often conflicting narratives about why a specific technological option has been chosen in the past and how it will perform in the future.

14 Elaborated cybernetic models are essential to technological decision-making, but their ability to fade out the contingency of decisions is limited. In the case of controversial technology, for every model that explains why a certain decision (e.g. regulatory intervention or absence thereof) will most likely have devastating effects on the overall system, another model demonstrates that the system will remain at equilibrium, while a third model suggests that the system does not rely on equilibrium in the first place. And this is exactly what is going on in the debate about network neutrality. Social systems theory is capable of explaining these diverging interpretations because it defines technology as an observer-dependent form in terms of functioning simplification, causal closure and an (artificial) boundary between controlled and noncontrolled causality.[22]

15 **4. The network neutrality controversy reflects concerns about a „digital ecology"**

There is a frequent utilisation of environmental and ecological metaphors in the network neutrality controversy. Network neutrality opponents state that "Market players have the obligation to find a new equilibrium to the benefit of the Internet ecosystem and society at large."[23] Network neutrality proponents refer to an "environment for innovation" that must not be weakened by network owners[24] or hold that we should focus on the "environment generated by technological innovation and regulation" and the "design of the media ecology" in order to guarantee media access.[25] And regulators maintain that "Promoting competition throughout the Internet ecosystem is a central purpose" of their policy.[26] The vast majority of publications concerned with network neutrality are using environmental or ecological metaphors

[20] Reidenberg, Joel R. (1998): Lex Informatica: The Formulation of Information Policy Rules Through Technology. In Texas Law Review 76 (3), pp. 553–584.
[21] Lessig, Lawrence (1999): Code and Other Laws of Cyberspace. New York: Basic Books.
[22] Luhmann, Niklas (1993): Risk. A sociological theory. Chicago: University of Chicago Press.
[23] ATKearney (2010): p. 43, see fn. 19.
[24] Lessig, Lawrence (2006): Testimony at the Hearing on Network Neutrality. Senate Committee on Science and Transportation,
February 7, 2006. Available online at http://www.lessig.org/blog/archives/Lessig_Testimony_2.pdf. Here: p. 2.
[25] Balkin 2008: 940, see fn. 7.
[26] FCC (2010): FCC Report FCC 10-201. In the Matter of Preserving the Open Internet. Broadband Industry Practices.
Available online at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FC-10-201A1.pdf. Here: p. 10.

when referring to the Internet. So, what is it with the 'digital environment' and the 'Internet ecosystem'?

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16 The similarities between the discourse about the 'natural environment' and the 'digital environment' are not merely a terminological coincidence, but that they can be compared (and are indeed comparable) on the level of communication, or more precisely, ecological communication. In this regard, debates about the sustainability of the Internet in general and appropriate actions regarding network neutrality in specific show similar patterns as debates about how to deal with environmental risks and hazards. While social theories (and social constructivist theories in particular) concerned with 'natural' risks and hazards have been very successful in explaining the incongruence of risk perception and the durability of conflicts, this knowledge has hardly been applied to information technology. Either 'technological' decision-making is still regarded to be merely a matter of discovering causalities or divergent perceptions of risks and hazards are restricted to the domain of industrial technology.

17 Although no one seems shy to stress that the Internet an ecosystem, there have hardly been any efforts to examine why this should be the case, not to mention that hardly anyone seems to be concerned about the function of this analogy. One notable exception is David Boyle who, in addressing intellectual property rights (IPR), suggests drawing an analogy between the politics of intellectual property and the environmental movement:

18 *"Assume for a moment the need for a politics of intellectual property. Go further for a moment, and accept the idea that there might be a special need for a politics to protect the public domain. What might such a politics look like? Right now, it seems to me that, in a number of respects, we are at the stage that the American environmental movement was at in the 1950's."*[27]

19 Boyle argues that there is a deficiency in our current understanding of intellectual property and that we should address IPR in the same holistic approach that the environmental movement addressed issues related to environmental pollution. I do not want to go into the specifics, but the advantage of his approach is that he does not linger on a metaphorical level but instead addresses the functionality of the concept of environment: it is not the environment itself but its communicative function that is equivalent in both cases – in ecological issues related to nature and in ecological issues related to the Internet. For example, the term 'environment' leaves open what is actually referred to, but at the same time suggests that basically anything might be relevant in some regard (artefacts and users, technology and law, economics and protocols). Further examples are: ecology (a concept with the ability to disrupt stable meanings and to disseminate them across and beyond the boundaries marking a specialized discourse[28]), welfare economics (other perspectives fail to internalize the environmental costs they are producing) and sustainability (a powerful figure of thought that constitutes a vague, yet undeniable ecological ethic: to argue against sustainability is to argue against sanity).

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20 **5. Network neutrality is a polycontextural issue that cannot be understood in economical, legal, or political terms alone**

Network neutrality is often described as something network engineers should care about. Yet treating network neutrality merely as a technical issue misses the whole

[27] Boyle, James (1997): A Politics of Intellectual Property: Environmentalism For the Net? Available online at http://www.law.duke.edu/boylesite/Intprop.htm. Here: Chapter V.
[28] Bono, J. J. (1990): Science, discourse, and literature: The role/rule of metaphor in science. In S. Peterfreund (Ed.): Literature and Science: Theory and Practice. Boston: Northeastern University Press., pp. 59–89.

point of the controversy. First of all, other than two or three decades ago, there is a certain public awareness that decisions related to network design will have severe effects on our daily lives, on the ways in which we may or may not interact; or, to stick to systems theory: on the conditions under which interactions and organizations may or may not reproduce themselves. Secondly, under functional differentiation, the subsystems of society interpret differences (including differences in the way data or information is processed and transmitted) only according to their own internal logic. Law observes network (non-) discrimination with the code lawful/unlawful – independently from the distinction that may be used to discriminate data in the first place. As far as data discrimination 'makes a difference' (is information) to the legal system, it may build up resonance (for example, grant compensation where unlawful discrimination has occurred). The same applies to the political system, to the economy, to science and so on. What Lessig's 'optimal mix' of the four 'modalities of regulation' (the law, the market, social norms and technology itself, also referred to 'architecture' or 'code') ignores is the problem that there is no single regulatory entity that is capable of deciding which measure is appropriate in a given context[29].

21 Polycontexturality must not be confused with complexity. Cybernetic models of Internet regulation focus on the latter and tend to ignore the former. The law of requisite variety[30] is an extremely popular concept among theories concerned with Internet regulation. But it is usually applied in from within a cybernetic ontology under which the distinction between system and environment is kept unconsidered. As a consequence, most theories simply state that the regulator's variety must adapt to the environment's variety. One example of this argument is the aforementioned 'optimal mix' of the four modalities of regulation that Lessig proposes. Another example is Andrew Murray's idea of "modelling symbiotic regulation" in order to avoid regulatory tensions.[31] But insisting that requisite variety is the answer to regulatory tensions underestimates the whole issue on a theoretical as well on a practical level.

28 **6. How will the global law cope with network neutrality regulation?**

From the perspective of second-order observation, regulation cannot mean producing the preferred state of the system in the long run. Instead, it means reducing the differences between the current and a preferred state of specific variables, but reducing these differences requires producing differences. "You never get a system which no longer deviates from expected values."[32] As far as the preferred state of network discrimination is concerned, legislators are in disagreement as to whether there is anything broken that needs fixing in the first place. In December 2010, the FCC issued rules for 'reasonable network management' in a 3-2 split decision.[33] Republicans in the U.S. House of Representatives passed Resolution HJ 37 EH in April 2011 to disapprove the rules submitted by the FCC even before they came into effect (although the resolution is unlikely to pass through the Senate). The FCC report and the political turmoil that followed reflect the dilemma between regulatory intervention and regulatory abstinence that is characteristic for network neutrality regulation. The general reception of the FC report has been quite disastrous. Network neutrality proponents blamed it for not being consequent enough; many consider it to be counterproductive. Opponents of governmental intervention regard it as the beginning of an era of Internet regulatory arbitrage.

29 Even where there is a majority for a proactive network neutrality policy, it is far from

[29] See also Gutwirth, Serge; Hert, Paul de; Sutter, Laurent de (2008): The Trouble with Technology Regulation: Why Lessig's 'Optimal Mix' Will Not Work. In Roger Brownsword, Karen Yeung (Eds.): Regulating Technologies. Oxford: Hart, pp. 193–218.
[30] Ashby, William Ross (1956): An introduction to cybernetics. London: Chapman & Hall.
[31] Murray, Andrew D. (2007): The regulation of cyberspace. Control in the online environment. Milton Park, Abingdon; New York, NY: Routledge-Cavendish.
[32] Luhmann, Niklas (1990): Technology, environment and social risk: a systems perspective. In Industrial Crisis Quarterly 4, pp. 223–231. Here: p. 228.
[33] See above, fn. 26.

clear whether network discrimination should be approached as a political issue (e.g. national broadband plan), a constitutional issue (e.g. freedom of speech) or an economical issue (e.g. competitive distortion). Furthermore, there is a variety of conflicting norms and regime collisions that need to be addressed. Attempts to establish non-discrimination rules as a global principle level may clash with domestic filtering policies[34]. Shifting responsibility to the WTO or to ICANN is likely to produce conflicts between transnational regimes and NGOs.

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30 Furthermore, it is quite unclear whether and how network neutrality violations might be detected and evaluated. Packets may be dropped in bad faith but also as a result of misconfiguration or network congestion (the Internet still is a "best-effort network"). In a similar vein, "reasonable network management" leaves much room for interpretation, and probably necessarily so, as providers are facing quite hostile network activities and need to be able to drop malicious packets in order to guarantee network availability. In a strict sense, this would qualify as a network neutrality violation.

31 The four "Internet Freedoms" that have been developed by former FCC Chairman Powell reflect these ambiguities.[35] These four "Internet Freedoms" state (1) the freedom to access any legal content, (2) the freedom to use any application of choice, (3) the freedom to attach any devices to the network and (4) the freedom to obtain service plan information. What are the implications of these proposals? The first 'freedom' demands that the decision whether to block or filter any content must only be made by the legal system (and not by the network operator). Powell adds the somehow diffuse notion that "network operators have a legitimate need to manage their networks and ensure a quality experience", but that those efforts must be clearly spelled out and should be "as minimal as necessary". The second 'freedom' is directed against application discrimination, for example the blocking of a specific application such as peer-to-peer software by network operators. Consumers should be allowed to run any application "unless they exceed service plan limitations or harm the provider's network". But who decides what constitutes a 'harm' to the provider's network? The third 'freedom' allows the customer to use his Internet connection however he wants and with any devices he chooses to attach. Once more, this freedom is put into perspective by the addition "so long as the devices operate within service plan limitations and do not harm the provider's network or enable theft of service". The fourth 'freedom' demands transparency of the customer's service plan in regard to bandwidth tiering and the network operator's "protection" measures towards spam, spyware and "other potential invasions of privacy". This in turn puts into question the first 'freedom': if network operators may engage in filtering 'malicious' data, does this kind of traffic necessarily be considered 'unlawful' (and by whom)?

32 I am not implying here that network neutrality regulation is unnecessary or even counterproductive. The network neutrality debate has brought to surface the "battle over the institutional ecology of the digital environment"[36], and it was about time. But if I am not mistaken, it may pretty well turn out to be a Pandora's box which, once opened, requires a constant readjustment of system states, making 'network neutrality' a long-term control project. Maybe there are some lessons to be learnt from the impact of the environmental movement which massively shaped the global legal environment that we are witnessing today.

[34] Mueller, Milton (2007): Net Neutrality as Global Principle for Internet Governance (Internet Governance Project, Paper IGP07-003).
Available online at http://internetgovernance.org/pdf/NetNeutralityGlobalPrinciple.pdf.
[35] Quoted in Lessig (2006), see fn. 24.
[36] Benkler, Yochai (2006): The wealth of networks. How social production transforms markets and freedom. New Haven, Conn: Yale University Press. Here: p. 383.

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