

A Win for Net Neutrality and Democracy

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Effective this year, the Federal Communications Commission (FCC) ruled that all companies providing Internet access publicly disclose their management practices, not block customer access to any lawful websites, and not block access to any application that may compete with their own services. This is an important victory for net neutrality and democracy. Just as the public highway system enables free travel, a strong and neutral communications infrastructure enables our public discourse. “Neutral communications...is the basis of a fair competitive market economy. It is the basis of democracy, by which a community should decide what to do. It is the basis of science, by which humankind should decide what is true” (Berners-Lee, 2006). Such a communications infrastructure must be unhampered by corporate and political interests.

The term net neutrality, coined in 2003 by Columbia Law Professor Tim Wu, means that all Internet traffic is treated equally regardless of who is sending the message, what is in the message, or who owns the medium over which the message is sent. Net neutrality doesn't deny carriers the right to charge more for faster Internet access. Rather, it says that once Internet access has been purchased, users should be able to access all legal content on the web.

While the FCC passed a much needed ruling, the victory is only partial. Firstly, the ruling distinguishes between wired and wireless access to the Internet. While this distinction is relevant when I access the Internet in an Internet Café, few of us think of it when accessing Internet content. The ruling does an adequate job preserving the openness of the Internet when it is accessed via a wired connection such as DSL¹ or a cable modem. However, it provides little protection when the Internet is accessed via a wireless device such as a wireless enabled laptop, a cell phone, or a PDA². As mobile broadband matures, net neutrality regulation will need to be expanded to wireless connections to the Internet. Secondly, while the ruling lays groundwork to preserve the openness of our communications infrastructure, Congress and the courts must uphold the FCC's ruling. Verizon has already sued the FCC, claiming that, with the ruling, the FCC exceeded its authority and violated Verizon's constitutional rights (Wyatt, 2011).

The internet has become our communication life-line. It has changed how we communicate with each other, how we educate our children, how and where we work, and how we entertain ourselves. In a country that enjoys democratic rule, can we vote wisely without access to information from a wide variety of sources? Historically, a limited pool of television and radio networks failed to provide unbiased and well-rounded coverage, and major newspapers limited our access to information. Imagine how control by a few major players could rob us of the innovation, diversity and democratic nature of the current Internet. Net neutrality regulations are vital to our democracy.

The FCC is the appropriate arm of government to regulate the Internet. The FCC guarded our communications infrastructure with non-discriminatory common carrier principles during the birth of the Internet. It has an established and effective process for gathering consumer and industry input. Congress and the judiciary need to support the FCC in its work to preserve an open Internet.

Gatekeepers

Tim Berners-Lee, creator of the World Wide Web, captures one aspect of net neutrality when he explains, "If I pay to connect to the Net with a given quality of service, and you pay to connect to the net with the same or higher quality of service, then you and I can communicate across the net, with that quality of service...[We] each pay to connect to the Net, but no one can pay for exclusive access to me." (Berners-Lee, 2006) In other words, even though a service provider owns and operates the pipes that my data passes through, they may not discriminate against my data. I am assured that even if I'm using a product from a vendor that my Internet service provider competes with, my provider must still facilitate my use of that competitor's product.

A neutral network has no gatekeepers in the sense that if I create a web application, I can make my application available on the web using my purchased connection to the Internet, and my application becomes available to all. I did not have to pay a gatekeeper to allow my application to pass.

Consider a similar situation with news stories, radio broadcasting or television shows. If I have a great idea for a situation comedy and my friends and I have begun filming, without the Internet I need to sell my idea to a television network. If they like the idea, they will include our show on their network as a broadcast to the public. Similarly, say I write political commentary. Without the Internet I am free to mass produce my commentary and distribute it to the public. However, paying a major news agency or network to carry my commentary would reach a larger audience. In a very clear sense, the television networks and major news agencies are gatekeepers. I not only must pay them to distribute my content, but they may choose whether or not to carry it.

When newspapers, radio, and to a limited extent TV began, each started as fairly open media that were later monopolized or controlled by major networks. Although those major players gave consumers an illusion of choice, the networks held tightly to their gatekeeper role. To some extent, the cost of getting into the market caused the existence of certain kinds of gatekeepers. Someone with an excellent new car design cannot typically begin manufacturing cars. It is just too expensive to get into the market, and those who have already made that investment are highly motivated to protect them.

The Internet, however, is different. It is not expensive to generate content and send it over the Internet. Even an application as significant as the World Wide Web "rolled out over the existing Internet without modifying it," according to creator Tim Berners-Lee. Berners-Lee explains that he did not need to sell his idea to an Internet gatekeeper. Furthermore, he envisioned the World Wide Web as an open "pool of human knowledge". It was meant as a universal, neutral platform that didn't "discriminate against particular hardware, software, underlying network, language, culture, disability, or against particular types of data." We have enjoyed openness in both the Internet and the World Wide Web. We have all benefited from it. However, the neutrality of the Internet is threatened, because the commercialization of information and communication offers tremendous economic incentive and political power.

Neutrality Violations

After Downing Street, now called *War Is A Crime*, is a web-based organization that advocated the end of the war in Iraq and the impeachment of President George W. Bush.

According to David Swanson (2005), co-founder of After Downing Street, Comcast, the largest home Internet service provider in the United States, filtered all email communications of its subscribers that contained the term www.AfterDowningStreet.org. The email filtering was discovered when members of After Downing Street failed to show up for meetings and other events. Comcast was confronted, and while at first it refused to discuss the possibility that it was doing this type of email filtering, it eventually admitted that Symantec's BrightMail filter, which filters email for all Comcast, America Online and Cox Cable accounts, had filtered based on the phrase www.AfterDowningStreet.org. Symantec claimed that it made this filtering decision after receiving 46,000 complaints about After Downing Street. Symantec refused to make any of these complaints public. Since After Downing Street had only existed for six weeks, and Symantec acknowledged that the political organization did not use spamming techniques, it is unlikely that After Downing Street was able to annoy 46,000 individuals so quickly. Swanson, however, doesn't believe that the filtering was necessarily malicious. Possibly someone politically opposed to the agenda of After Downing Street generated the complaints (Swanson, 2005).

This incident is significant because Comcast effectively censored discussion of political topics without making its policies known and, once exposed, without explaining itself. Comcast was not required to make Symantec reveal the complaints or publish a list of sites being blocked. There was no policy where the victims of complaints were notified to make them aware of the accusations against them. Victims were not provided an opportunity to defend themselves. If it turned out that the complaints were counterfeit, there were no penalties for the culprit that made the complaints. Comcast is the largest cable operator and the largest home Internet service provider in the United States (Comcast, 2010). It has a near monopoly on high-speed Internet service in Washington D.C. As Comcast moved into becoming the largest home Internet service provider in the United States, did it also inherit an obligation to protect free speech and consumer access to information? The FCC's ruling finally makes it live up to such an obligation.

Unfortunately such censorship can be applied to any group. Jim Kouri, staff writer for the conservative news group News With Views, complained that his group's emails were filtered. Kouri (2007) claimed that Internet service providers SBC Global and EarthLink blocked delivery of News With Views emails for subscribers who had expressly chosen to receive email and news updates from News With Views. Kouri went on to claim that SBC Global blocked emails from at least four other conservative newsletters. This suggests that SBC Global, perhaps unlike Comcast, was motivated by a political agenda.

Probably the most publicized neutrality violation is Comcast's throttling of BitTorrent traffic. BitTorrent is a company that provides free software for sharing large files over the Internet. The protocol used to share these files is called peer-to-peer (P2P). Comcast argued that in order to manage its network, it could not allow excessive use of the Internet by customers. This led, in part, to Comcast interfering with Internet traffic that used the P2P protocol. The FCC received numerous complaints that Comcast was throttling P2P traffic. After an investigation, the FCC voted 3-2 to condemn these practices (Morphy, 2008). The FCC criticized Comcast's network management practices, calling them highly invasive and likely motivated by anti-competitive issues (FCC, 2008). After all, P2P applications provide Internet users with the opportunity to view high-quality video, video that customers might have paid Comcast to watch on cable television.

The method that Comcast used to throttle BitTorrent traffic was particularly insidious. When a Comcast user sent a packet using the P2P protocol over the Internet, Comcast sometimes shut down the connection. When doing so, however, Comcast did not announce the shutdown to

both parties. Instead, it used packet-forging, generating a reset package and sending it to both parties, thereby telling both users to shut down the connection. This is similar to a situation where you are on the phone talking to a friend and a voice comes onto the line sounding like your friend saying, "I've got to go now, bye." Your friend, on the other end, heard the same message, but in your voice. In fact, the phone system disconnected your call, but in a way that each of you assumed it was the other's intention.

Comcast was charged and paid \$150,000 in fines for their invasive and anti-competitive practices; however, the company admitted no wrong doing and the courts agreed. In *Comcast versus the FCC*, the federal courts stated that the FCC had overstepped its authority in demanding that Comcast treat all Internet traffic equally (U.S. Court Records, 2010). The courts reiterated the importance of preserving a free and open Internet; however, they ruled that since Comcast didn't provide *telecommunications services* (basic telephone traffic) but provided *information services* (such as VoIP³ where voice conversations are routed over the Internet), Comcast is governed under Title I of the Communications Act and does not need to adhere to common carrier principles. The courts agreed that Comcast violated FCC principles but stated that these principles were only guidelines, not enforceable by law. At that time, the FCC had not laid the groundwork to enable it to safeguard a free and open Internet. The FCC has now laid that groundwork. It is critical that the Congress and the judiciary uphold it.

Ruling

In 2009, the FCC launched a public process to determine how to preserve those characteristics of the Internet that allowed it to become an indispensable platform supporting our nation's "economy and civic life" (FCC, 2010). They stated that the Internet thrives due to its freedom and openness. They claimed openness promotes competition and enables a "self-reinforcing cycle of investment and innovation in which new uses of the network lead to increased adoption of broadband, which drives investment and improvements in the network itself, which in turn leads to further innovative uses of the network and further investment in content, applications, services, and devices" (FCC, 2010). The FCC acknowledged that broadband providers had endangered the Internet's openness. They stated that providers sometimes have clear financial interest in blocking competitor's services, so would likely endanger the openness of the Internet in the future. Thus, in order to foster and accelerate the cycle of investment and innovation, the FCC established three basic rules or principles: transparency of management practices, no blocking of Internet content, and no unreasonable discrimination of such content.

The rulings are considerably weaker for wireless mobile carriers than for wired carriers. Both must disclose their network management practices. Wired broadband providers can not block "lawful content, applications, services or non-harmful devices", nor can they discriminate in transmitting any lawful network traffic. Wireless providers, on the other hand, are only prohibited from blocking "lawful websites [and] applications that compete with the provider's voice or video telephony services" (FCC, 2010).

While the FCC distinction between wireless and wired carriers may seem arbitrary, and was certainly the result of a compromise, it has some legitimacy. Users typically don't expect a distinction between wired and wireless connections when they are browsing Internet content. I sometimes connect to the Internet via a cable modem from my home, and other times over Wi-Fi from the Starbucks in Butte. I expect to be able to access the content of my choice in either case.

However, my daughter connects to the Internet via her phone. I was surprised that she could watch *YouTube* videos and update her *Facebook* status from her phone. Supporting an expanding array of smartphones, aircard modems and other devices, all enabling bandwidth intensive applications, requires tremendous infrastructure. The FCC stated that wireless is at an earlier-stage in its platform development. Its speed, capacity and penetration are all lower than for fixed broadband. Therefore, it is understandable that wireless providers discriminate against some traffic, in order to ensure that basic phone use, that of talking and texting, is preserved.

Network technology is evolving quickly and care must be taken not to regulate before there is a clear understanding of its implications on technological innovation. Wired and wireless networks, which are interconnected and carry the same signals, have different characteristics. Increasing the carrying capacity of wired networks is a matter of laying more lines. This is not the case for wireless networks. The wireless spectrum has a limited carrying capacity. Currently, the wireless spectrum is underutilized; however, a time may come when the entire spectrum has been licensed.

Why Regulate?

Representative Marsha Blackburn plans to introduce legislation to prohibit the FCC from enforcing net neutrality rules (Blackburn, 2011). Increasing regulation on such a rapidly changing and complex technology can be risky. The broadband carriers say, “Why interfere with something that isn’t broken?” The Internet has thrived from innovation; why hamper it with regulation?

We are a country accustomed to efficiency and privacy in our communications. Before our national telecommunications system was forcefully split into seven regional companies, it was affectionately called Ma Bell. When you picked up a telephone receiver, you heard a dial tone—always. You could count on that connection to the outside world.

While the phone system was privately owned and operated, it was highly regulated. The phone company owned the copper wire that carried our conversations, but they were not allowed to listen in. Similarly, the postal service carries our letters, but postal workers are not allowed to read them. Along with privacy, Americans could count on non-discrimination. Neither the phone company nor postal service was allowed to delay or drop a message based on the message’s content, sender or destination.

President Franklin Roosevelt recognized the importance of a strong nationwide communications infrastructure that assured privacy and non-discrimination. The New Deal included the Communications Act of 1934 and the establishment of the FCC. The FCC was created to consolidate existing radio, television and telephone regulations under a single agency, thereby moving towards a national communications infrastructure, privately owned and operated, yet regulated for the public good.

Roosevelt’s foresight provided guarantees that many of us take for granted so much that we assume similar guarantees in relation to the Internet. For instance, it is easy to act as though our email is private, although many of us access our email at work, and the companies owning these private networks may implement inspection and filtering policies. Luckily, with oversight a level of privacy can be expected. For example, on the Montana Tech campus where I teach our union contract acknowledges that “faculty have an expectation for a reasonable degree of privacy in the use of the employer’s computers and network” (MEA-MFT, 2009). Of course, this must be in accordance with Board of Regents Policy (BOR, 2010), which allows email monitoring, e.g.

searching for sensitive keywords for the purpose of managing and administrating the network⁴, not to see if a faculty member is disgruntled over the new non-smoking policy.

Loss of Neutrality

A short history of the Internet and its relation to Roosevelt's nationwide communications infrastructure, envisioned 30 years earlier, reveals how the openness of the Internet was in jeopardy. In 1965, Lawrence Roberts, at Massachusetts Institute of Technology Lincoln Labs, submitted a proposal to Congress to explore computer resource sharing and packet switched communications (Roberts, 2007). The Defense Advanced Research Projects Agency, DARPA, was interested in such a project, because they wanted a communications network that would work even if some of the sites were destroyed by a nuclear attack. Roberts showed that such a network was feasible by connecting an MIT computer to a California computer over a dial-up telephone connection. While this demonstrated that a wide area network was possible, it also showed that telephone lines' circuit switching was inadequate for such a task. Through DARPA, Roberts created the ARPANET, and for approximately 20 years special purpose cables were used to connect computers into a network. These special purpose cables were government rather than privately owned, and were not regulated as part of a nationwide communications infrastructure.

In 1983, the military split off its own network, creating the military network, MILNET, and leaving the ARPANET as a mostly non-classified research network. Around this time, the National Science Foundation (NSF) had several initiatives to spread the benefits of networking. CSNET connected computer science departments in universities that weren't already connected via the ARPANET. NSFNET connected private companies and public universities. The people at NSF wanted to avoid the limitations of the ARPANET by making a network that would eventually become "financially self-sustaining [and] not dependent on government funding or control" and "able to grow quickly and accommodate as many users as possible" (NSF, 2009). To achieve these goals, they chose the IP⁵ protocol to connect regional computing centers. IP was simple and so flexible that it was easily adapted to a wide range of equipment and software, including telephone lines. It was also not patented. While universities were likely to lay their own cables to connect computers internally, they could use the existing telephone lines to connect their computing center to other computing centers. These existing telephone lines were part of Roosevelt's communication infrastructure and were governed for public good by the FCC.

During this early period (1983-1990), commercial traffic was not allowed on NSFNET unless it contributed directly to education or research. Commercial networks were developed in parallel with, but independent of, NSFNET. Rather than having a plethora of private networks, NSF decided to allow commercial traffic on NSFNET. NSF also looked for ways to transition NSFNET to private industry, eventually withdrawing by deciding to use privately owned *Network Access Points* to connect the network at the top level. NSF awarded four contracts for these high level access points: Pacific Bell (California), Ameritech (Illinois), Sprint (New York) and Metropolitan Fiber Systems (Washington, D.C.). These four contracts marked the birth of the Internet. While the Internet itself was not part of Roosevelt's nationwide communications infrastructure, each of these companies provided telecommunications services covered under the Communications Act of 1934. Thus, from the beginning the Internet was regulated by the FCC and required to adhere to established common carrier regulations.

The idea of a common carrier dates back to Roman times when--rather than a telephone service, postal service or Internet Service Provider--the common carrier was a human messenger. While these messengers carried messages, they didn't own them. The carrier was not allowed to edit the message and typically forbidden from viewing it. Their job was to deliver the message in a reasonable time. Roosevelt understood this historical principle and recognized that a strong nation required a national communications network with common carrier regulations.

Since the Internet was implemented on top of the telecommunications infrastructure common carrier, guarantees were an existing side benefit rather than a newly defined policy. As Internet infrastructure changed, however, this side benefit was lost. Cable companies developed new ways to deliver television to the home and recognized that huge profits could be made if they also delivered Internet traffic. Recall that the IP protocol of the Internet is extremely flexible and easily adapted for a cable company's coaxial cables. Cable companies, however, were used to carrying more than just Internet traffic. They had been delivering television to the home and envisioned new entertainment services to offer their customers. However, in order to offer these enhanced services, they would need to view and possibly manipulate the messages they carried. Thus, the cable companies argued that common carrier principles should not be applied to them. After all, they were not part of the original nationwide communications infrastructure. They were private companies providing entertainment. The FCC accepted this argument, and in 1996 updated the Communications Act with the Telecommunications Act, which released cable companies from common carrier regulations.

One example of the benefits that cable companies derived from this decision was that, while telecommunication companies needed to allow competitors to connect to their network, cable companies did not. In the court case *Brand X versus the FCC*, Brand X represented equipment manufacturers who wanted their customers to be able to connect their equipment to the coaxial cables owned by private cable companies. They argued that cable companies should provide a sort of public right of way as telecommunication companies do. The FCC argued against the equipment manufacturers. In line with their decision not to force cable companies to adhere to common carrier principles, the FCC argued that, even though cable companies needed to be allowed to connect into the existing Internet, they were not similarly required to allow other equipment manufacturers to connect to their cable. *Brand X versus the FCC* went all the way to the Supreme Court and was decided in 2005 in favor of the FCC. That is, cable companies and any company that offers information services did not need to allow competitors to connect their equipment to the information services network. Luckily, the latest FCC ruling reversed this decision for wired connections to the Internet.

The Internet is unusual in that it allows information to flow to a tremendous number of people, allows communication in both directions, and has no gatekeepers. Given the many problems in our world today – global warming, diminishing cheap energy sources, and economic disparity – we desperately need this powerful communication system to help us work out solutions. It is difficult, however, to strike a balance between consumers' need for open, rich access to the Internet and appropriate network management practices.

We need to preserve the idea of a common carrier, but we can't use the simple rules that worked earlier. While the idea of dumb pipes (pipes through which messages pass freely without the owners of the pipes viewing or in any way manipulating those messages) worked well for the postal and telephone systems, it doesn't work for the Internet. The Internet is a more sophisticated system and the very messages which are being transmitted could harm the network. For example, a malicious server can generate millions of *denial of service* requests in an attempt

to shut down a network. Filtering based on arrival time distribution from a given source is required to detect and drop these malicious messages. Similar to how email filters are necessary, some filtering of Internet traffic is too. The latest FCC ruling allows for reasonable network management, yet provides protection of the Internet by requiring the disclosure of those practices.

Conclusion

Tim Berners-Lee, the inventor of the World Wide Web, said:

“Yes, regulation to keep the Internet open is regulation. And mostly, the Internet thrives on lack of regulation. But some basic values have to be preserved. For example, the market system depends on the rule that you can't photocopy money. Democracy depends on freedom of speech. Freedom of connection, with any application, to any party, is the fundamental social basis of the Internet...The Internet is increasingly becoming the dominant medium binding us. The neutral communications medium is essential to our society” (Berners-Lee, 2006).

The Internet has provided us with a medium with which we can share innovations and ideas without a gatekeeper. The FCC has moved forward in preserving this important democratic vision. Without such regulations, the Internet would likely go down the path that newspapers, radio and television media have gone down—a path dominated by a few large commercial interests. The current ruling, while leaving further regulation of wireless communication to the future, has provided a balanced compromise between openness, transparency of management practices, and the need to provide for further technological innovation. The FCC has accomplished much in preserving the neutral Internet that Americans need. It is up to the Congress and judiciary to support the FCC.

¹ DSL stands for Digital Subscriber Line.

² PDA stands for Personal Digital Assistant.

³ VoIP stands for Voice over IP.

⁴ BOR Policy 1302: “Personal information gained through monitoring will be held in confidence by the MUS when required by law. Records obtained by monitoring may be used within the MUS by MUS officials, employees and agents for purposes appropriate to the management and administration of the MUS, including the investigation of possible misconduct by a user or a third party.”

⁵ IP, or Internet Protocol, is the network layer protocol in the ISO, International Standards Organization, OSI, Open Systems Interconnection, seven layer network model. It is often used in conjunction with the transport layer protocol, TCP. Together they are called TCP/IP. TCP/IP is so basic to the Internet that it is now known as its own model, sometimes called the Internet Model. The TCP/IP model describes a set of general design and implementation guidelines such as how data should be formatted, addressed, transmitted, routed and received.

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