

Net Neutrality and People with Disabilities

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Executive Summary

This paper explores the issue of net neutrality (also known as network neutrality) as it relates to Americans with disabilities. The framework of net neutrality has been advanced by some in recent months as being a pro-consumer approach to regulation of the Internet. In fact, as this paper seeks to demonstrate, access to the public Internet requires not only that the network be open, but also that it be useable by all of us.

Government regulation is required for accessibility, for everything broadband gives us today and for the unpredictable exciting new services and benefits to come. Would a net-neutrality mandate limit or even roll back accessibility? We do not yet know. We do know, however, that a dumb or dark network is not the way to go: it did not work in the era of Plain Old Telephone Service (POTS) and certainly will not work for Pretty Amazing New Services (PANS).

An open and intelligent network may also lower end-user costs for consumers with disabilities. The paper concludes that net neutrality should not be mandated at this time. Rather, Congress should look to the NIST or the FCC to explore the many complex issues involved, particularly impact on accessibility and sophisticated services such as protocol conversion, telepresence, and video signing.

Net Neutrality and People with Disabilities

Introduction

As the U.S. House of Representatives took up a long-needed update to the 1996 [Telecommunications Act](#) (P.L. 104-104, amending the landmark Communications Act of 1934, 47 U.S.C. 151 et seq.), the issue of net neutrality took center stage in the 109th Congress. First at the Subcommittee on Telecommunications and the Internet, and later at the full Committee on Energy and Commerce, well-known Internet companies including Google, Amazon and Microsoft pushed for a “network neutrality” mandate that would create an Internet architecture in which intelligence resides at the edges (the computers of end users and their organizations, and the computers of private service providers) and not at the core (the routers and switches). To help make their case, these proponents of net neutrality raised the specter of a world in which private content providers might be charged for preferential treatment (e.g., higher-speed connections).

At the Subcommittee level, these arguments received the attention of lawmakers, but amendments that would mandate net neutrality failed. At the full Committee level, the vote on mandating net neutrality was closer (34 against, 22 for). In that session, several Democrats voted against [net-neutrality amendments](#), while several Republicans voted for. While it is good that the issue is being considered on the merits and not as a partisan football, the fact remains that the committee with jurisdiction remains split on net neutrality. As the bill moves to the House floor, there is no real consensus on the issue. Meanwhile, in the Senate, Olympia Snowe (R, ME) and Bryon Dorgan (D, ND), are reported to be preparing a net neutrality bill.

For these reasons, it is time for us to examine, and try to understand, what net neutrality does and does not mean.

Generally, for the purpose of this paper, I interpret the term “**net neutrality**” to mean a position that holds that the broadband Internet should be used for transport only. Intelligence should be at the edges. In defining the term this way, I include the caveat that I do not know, and do not believe others do either, precisely what activities of network owners and administrators would be prohibited by a mandate for net neutrality. That uncertainty is largely responsible for the caution expressed in this paper.

Suppose, for example, the broadband network were to create an “express lane” for video relay services (VRS) and peer-to-peer video. In this way, someone who becomes deaf or hard of hearing later in life can be assured of the high-speed connections and rapid screen refresh rates required for good video communication. This could prove to be extremely useful with the number of Americans with hearing loss possibly expanding by 40% in the coming decades as the 76-million-strong “Baby Boom” generation swells the ranks of Americans in their 60s and early 70s. See, for example, “[Disability Meets the Boom](#)” at *Ragged Edge Online*. Would a network neutrality mandate prevent such capabilities from being installed in the network? Stated differently: Is it possible that the broad goals of those who advocate for a network-neutrality mandate may be achieved while still preserving video “phone calls” which are, for all intents and purposes, functional equivalents of ordinary phone service for people who hear well?

Words matter in these discussions. Intelligence can be *at the edges* of the network (in end-user’s PCs, in organization’s servers, etc.), *on* the network (sitting somewhere), or *in* the network. No one is arguing against intelligence at the edges or on

the network. It is there now. Rather, the debate centers around whether it should reside, also, *in* the network. Some advocates of freedom of expression worry that intelligence in the network might limit free speech by screening certain content. Some consumer advocates express alarm at the prospect that some network administrators might charge service and content providers extra for high-speed, secure transport. Those additional charges might be passed on to end users. Two-tier networks frighten other observers, who worry about network administrators favoring their own content over that of others. On the other side of the debate are people looking ahead, worrying that prohibitions tying the hands of network owners and administrators might close the door on important potential broadband services and applications. Others opposing network neutrality note that network owners expended billions of dollars constructing the broadband network. Shouldn't they be permitted, no less than airlines and surface mail delivery companies, to charge premium prices for premium services?

These are important questions. What I have seen is that few on either side of the debate seem to have considered disability implications for the policies they promote. The potential impact on Americans with disabilities of different approaches to the issue is vital, and deserves careful study. In this paper, I recommend that the National Institute on Science and Technology (NIST), the FCC, or some other recognized body convene a blue-ribbon task force to explore disability as well as other issues surrounding network neutrality. Experts on disability technology and consumer representatives would be among the panel members. Until the group clarifies the potential meaning of net neutrality for people with disabilities, this paper asserts that the disability community adopt a position of “neutrality on net neutrality” – that is, no change from the status quo

unless further study reveals the need for changes so as to ensure accessibility. The issue is too important to our future to sidestep at this time. We as a community need to be engaged in this dialog.

Accessibility and Not Just Access

There is no debate about whether end users should enjoy the freedom to use the Internet as they wish. That is one of the strongest tenets of our Nation's policies. The Internet has been lightly regulated from the beginning. This fact is largely responsible for the incredible growth of the medium, allowing upstarts to create content, letting users surf far and wide, and supplying an ever more rewarding experience for communication, information, and commerce.

There is no debate, either, about whether end-user costs should be lowered. As I recently demonstrated, the greater [competition](#) in broadband video that is one of the goals of the Committee bill could cut consumer video costs by as much as 25%. That is vitally important for Americans with disabilities. It will make broadband affordable for millions who are not now connected.

However, freedom to use the Internet has another aspect: users must be *able to use* it. For me and for a large and [about-to-explode](#) cohort of tens of millions of Americans with hearing, vision and mobility limitations associated with the graying of the baby boom generation, freedom has to mean accessibility as well as access. That is one reason why light regulation cannot mean no regulation. It is not enough that the network be open. Accessibility is also necessary.

As that statement implies, the author brings to the debate over net neutrality several firm beliefs. One, the federal government should in this instance, as in many others, play its historical role as protector of the most vulnerable of our citizens: federal regulation over the Internet is justified, in my view, and indeed essential, in assuring that people with disabilities will have full access to and enjoyment of the Internet. The 1996 Act, for example, included Section 255, which requires that telecommunications products and services be accessible to and useable by people with disabilities, if doing so is readily achievable. Because that Act was written before broadband became widely used, section 255 applies only to traditional products and services. Now that we are in a new era, extending section 255 to the Internet is vital. Similarly, eight years ago, Section 713 of the 1996 Act called for captioning of virtually all broadcast and cable-cast television programming. It also authorized the FCC to call for programming to be video described for people who are blind or have low vision. Now that video streaming over the Internet is a reality, Section 713, too, needs to be extended to include the new ways in which people receive, download, and watch video.

Both the Subcommittee and the full Committee adopted amendments that serve to advance the interests of Americans with disabilities with respect to the Internet. Those amendments focus, not on net neutrality, but rather on accessibility of services and information, including captioning of video. One extends the accessibility provisions of section 255 of the 1934 Communications Act to Voice over Internet Protocol (VoIP) equipment and services. The fact that disability access language and network neutrality language co-exist in the same bills raises the question of whether these intersect. That is the core of this paper. The example of extending section 255 illustrates how the owners

and administrators of networks could contribute to accessibility and ease of use for Americans with disabilities. None of the disability amendments was controversial: each passed by voice vote. That is as it should be in 2006. Awareness of the diversity of needs among the American people is now high enough among policy makers that the importance of accessibility protections is widely recognized.

Intelligence IN the Network

Intelligence in the network is good. As discussed at length later (“Interests of People with Disabilities”), some broadband applications must be protected in order to be fully effective. This may well mean flexibility on the part of network owners and administrators. They have much flexibility now: they may offer dial-up, broadband, and virtual private network services. Do some uses require protection from surges of network traffic and other interruptions? Remote medical services (Litan, 2005), for example, are most effective if secure and reliable connections exist between community residents and the support personnel assisting them. We need to understand whether net neutrality might unintentionally tie the hands of network administrators in providing such protections.

The issue of net neutrality is, in fact, a continuation of a long-standing debate over the role and function of the network. In fact, as I write this, I have a strong sense of *déjà vu*. When I first began working, in 1989, on what became the 1996 Telecommunications Act, I battled misguided consumer advocates who insisted that POTS was perfectly good enough. They viewed communications as a commodity. The goal, for them, was low consumer costs. They ignored the simple fact that millions of Americans did not even have POTS. There were no relay services in those days. There were no e-mails, no

Instant Messages, no visual communication at all other than faxes. I can vividly recall receiving several hundreds of pages of faxes daily in the early 1990s – it was the only effective way people had of communicating with me. The other real-time communications option for me was to hire a full-time interpreter to listen on voice calls or for hearing people to use slow, balky teletypewriters (TTYs). What we had in those days was intelligence at the peripheries – literally, in the form of human sign-language interpreters – or figuratively, in the form of fax machines and TTYs. In either instance, intelligence at the edge cost me a lot of money. It was hardly functional equivalence to voice telephony for hearing people.

I thought dumb networks were a dumb idea then, and I think they are a dumb idea now. Let us be clear: Network neutrality is not about dumb pipes. There is intelligence at the edges now and there is intelligence in the network now. It is not as simple as “smart v. dumb networks”. Take Internet Protocol (IP) Relay services, for example. An IP Relay server sits at the edge of the network. It receives messages from users, sends messages to Communication Assistants (CA’s), sends messages to database servers about billing minutes, et cetera. These capabilities support access for people who are deaf or hard of hearing.

Intelligence in the network, as well as at its edges, is necessary to combat the unfortunate disruptive aspects of today’s public Internet. The organizational and personal routers, servers, and desktop computers at the edges contain some, but not all, of the spam, worms, viruses and other threats we confront every hour of every day. I know from personal experience with network administration that ongoing monitoring is needed at the peripheries of the Internet. It is an enormous and very resource-intensive job to

protect end users from the never-ending stream of spam, viruses, worms and other threats. Network managers at organizations, universities, and corporations – indeed, end users at desktops and laptops -- need the help of network owners in this constant battle. We need firewalls, spam killers and other configurations to protect the security of our personal information and communications. Do we need, or would we benefit from, screening inside the network as well? Can we do that without jeopardizing freedom of communication? That is another example of a question that, to my mind, today lacks a convincing answer.

We need to explore the potential of intelligence in the network for accessibility. Take, for example, captioning of video on the Internet. Video can be (and increasingly is!) produced anywhere. Creators can send the video (via packet switching) to a captioning service (for a list of providers of captioning, see “[Video and People with Disabilities](#)”). Once the video is captioned, it may be sent to the end user, again via packet switching. In this illustration, the intelligence resides at the edges of the network. All that is lacking, as I write, is a requirement to caption Internet-streamed commercial videos, just as broadcast and cable-cast video now must be captioned. But what if legislation does not extend the mandate for captioning? Could intelligence somewhere in the network supply it? Disregarding for the moment what are rather complex technical questions as to who would produce the captioning, how the network would identify non-captioned video, etc., let me ask the question most central to this paper: Would network neutrality shut the door on research and development to find network-based captioning solutions? That question leads us into our next topic.

Exciting but Unpredictable Internet

Finally, the [future](#) of the Internet is unpredictable – but very exciting. There are tremendous applications waiting in store for us. Just as ICQ (I Seek You) in 1996 and AOL Instant Messaging in 1998 took the world by storm, and as video relay service (VRS) revolutionized communications for people who are deaf or hard of hearing in 2002, I am confident that protocol conversion and other “pretty amazing new stuff” (PANS) are coming soon. These, too, will build upon, and require, intelligence in the network and the ability to make the services accessible to and useable by people with disabilities. Or look at Google Earth. This requires intelligence in the network (Google’s map servers) but it also calls for intelligence at the edges (you need to download apps to your computer). It’s a remarkable service. Surely, there are many more coming.

I am concerned that mandating network neutrality at this time could prevent those exciting new services from being accessible to all Americans. It may even be that this might lead to less open and less intelligent networks. That is because network neutrality might lead to less bandwidth than we need to maintain free and effective access to the Googles, Yahoos, and Amazons of tomorrow. If I have learned anything about broadband over the years, it is that whatever capacity becomes available rapidly and hungrily is used (see MySpace.com and its many consumer videos, for example). While it is true that, today, bandwidth capacity appears to be bounteous, we need to be cautious that we not inadvertently choke the broadband Internet in future years, as user demands continue to grow.

Interests of People with Disabilities

The U.S. Department of Commerce's most recent [report](#) on broadband, released in late 2004, shows that the proportion of Americans with disabilities reported to live in broadband homes was about the same as that of other Americans (about 20%). Appendix Table 1 of the Commerce report adds that among persons who are deaf or hard of hearing, about 26% lived in a broadband home. The proportions among persons who are blind or have low vision, who have difficulty walking, and who have other disabilities were only slightly lower. Clearly, Americans with disabilities are embracing broadband. It is not difficult to see why – and why the potential for even greater benefits is there.

Greater capacity within the network itself is, I believe, important for these benefits to be realized. The “killer apps” that I discussed in an [earlier paper](#), some of which are briefly outlined below, require some intelligence in the network.

Independent Living

Millions of Americans with disabilities can live independently, or semi-independently, in the community if essential support services are available. The adequacy of community support services became an urgent national concern following the U.S. Supreme Court’s June 22, 1999 decision in Olmstead v. L.C., 527 U.S. 581. The Court interpreted the 1990 Americans with Disabilities Act as requiring that individuals with disabilities be served in the "most integrated setting" appropriate for meeting their needs. In response to an [executive order](#) by President George W. Bush, the U. S. Department of Health and Human Services (2001) issued a report (<http://www.hhs.gov/newfreedom/prelim/>). That

report noted that technology has an important role to play in carrying out the President's executive order to implement the Olmstead decision.

Technology can assist people with disabilities to live independently in the community, using support services that are made both possible and economical by broadband connections. Few-to-many services – using broadband to connect individuals with medical or other trained professionals who can provide assistance on an as-needed basis – may suffice. In these instances, a small team of support workers monitors a large number of community residents and dispatches in-person assistance only when needed. Broadband greatly facilitates many-to-few support because it enables telepresence.

A report by the National Academy of Sciences, [Broadband: Bringing Home the Bits](#), described "**telepresence**" as "having a continuous window open into another space" (Chapter 3, p. 19), adding:

In a personal setting, telepresence may enable a parent to have a continuous window on a child at a day care facility, thus enabling a closer ongoing relationship, even with working parents. Telepresence could possibly enable new forms of extended-family relationships over distances. An interesting attribute of telepresence is that it potentially poses higher bandwidth demands than one might expect from videoconferencing applications. This is because the premise of telepresence is that the window is always open, to enable spontaneous observations and interactions.

Thus, telepresence provides an always-open “window” to the community resident’s home. It requires a two-way connection between the person’s residence and the support team’s office. The team can see, and hear, the individual at any time. This allows the resident to receive personal assistance instantly and to signal emergency needs at any time. Real-time, two-way, voice/video/data communications can take place in

which support workers answer questions, offer step-by-step instructions for solving problems, and remind residents of important appointments or other scheduled events.

Importantly, telepresence permits the central support team to monitor dozens of apartments or other residences simultaneously. This allows a small team efficiently to provide support to a large number of community residents. That is so because most individuals living independently or semi-independently in the community do not need round-the-clock help. Rather, they periodically require information or assistance. Thus, a centrally located team equipped with a dozen or more monitors each of which is continuously connected to people's homes can economically offer the needed periodic support simply by enlarging any one of the screens and giving the individual depicted there undivided attention for the duration of the need.

This makes telepresence economical. From a user's perspective, it is equally important that the support is remote. They can, and do, live independently as much and as long as they desire, secure in the knowledge that assistance is instantly available when required.

A variation on telepresence is **telemedicine**. Here, remote monitoring of vital health signs is performed. Again, the two cardinal advantages surface: the service can be economically provided because of its many-to-one nature and the user maintains his or her independence and privacy at all times other than when he or she needs help. With respect to cost-benefit and cost-effectiveness, Litan (2005) is unequivocal: remote monitoring is far more economical than are more traditional approaches.

Telepresence and telemedicine both require integrity of the two-way connections. Regardless of the spikes and valleys of network use by others, a high-speed always-on

connection is necessary. This calls for network administrators to have the authority, and the flexibility, to preserve these vital connections, protecting them from adverse events. This is, in fact, one aspect of intelligence in the network. They do this today. What we need to be alert to is whether net neutrality would tie the hands of network administrators, limiting their ability to maintain the integrity of these life-saving connections.

Video Signing

Millions of Americans who are deaf or hard of hearing are using broadband to “make and receive phone calls.” For people like me, signing to a digital video camera is functionally equivalent to speaking into a telephone mouthpiece. And watching video of someone signing is functionally equivalent to listening to a telephone earpiece. The use and repetition of the term “functionally equivalent” is intentional. The 1996 Telecommunications Act, in title IV, requires all telecommunications providers to make available to persons like me relay services that offer functional equivalence to voice phone conversations.

Video signing requires high-speed connections. It works best with at least 1 mbps (megabits per second) connections and with at least 15 frames per second (fps) refresh rates. With both numbers, more is better: 2 or 3 mbps and 30 fps offer much greater clarity. Lower speeds and fewer refreshes, both of which occur when traffic congestion slows the ‘Net, disrupt video communications. Motion becomes jerky. Frames freeze. These consequences are serious: communication becomes difficult or impossible. Thus, for video signing to be functionally equivalent to voice-level communications, the connections need to have integrity. They need to be preserved from the ravages of

network congestion. Network intelligence can offer a safe haven for VRS users, helping to ensure functional equivalence.

Video signing has taken off like a rocket. Video Relay Service (VRS) providers log some [two million minutes](#) of service each *month*. Video Interpreting (VI) providers, too, are experiencing strong demand. To illustrate, [Sign Language Associates](#) (SLA), of Silver Spring, MD, bills \$2.50 per minute for its service, [Video Interpreting Program](#) (VIP), with a \$50 reservation fee. SLA told the writer of this paper that in 2005 and 2006 the service has really taken off. Meanwhile, while statistics are not available, anecdotal evidence indicates that peer-to-peer video signing (two people who are deaf conversing with each other via sign language over broadband connections) is also experiencing rapid growth. The National Association of the Deaf (NAD), for example, is making far greater use of peer-to-peer signing this year than ever before. In fact, even staff members whose offices are a few doors from each other are engaging in peer-to-peer signing! They are using it as hearing persons use the phone.

All of these uses of video signing are illustrations of the functional equivalence of video signing to traditional voice telephony.

Protocol Conversion

Information is transmitted over the Internet in digital format – 1's and 0's. Neither the networks nor the data care which protocols are used. This means that an intelligent network can re-configure information from one format to another. An e-mail that I type using text and send to my friend Paul Schroeder (who is blind) can be converted from text to voice so that he can listen to it.

We have text to speech now. For it to work for him, Paul has to install text to speech software on whatever machine he uses (his desktop at home, his laptop, his desktop at work and, if he's traveling, whatever machine he uses at the remote location). Cables have to be connected. Each time Paul upgrades to a new version of his computer operating system, he has to wait for a new version of text to speech to appear. Whenever there is a problem, Paul has to trouble-shoot. We all do. For Paul, though, the possibilities through which he has to sort are greater in number. He needs not only check for viruses, for worn or disconnected cables, for bugs in software, for incompatibilities between products, as do the rest of us, but also problems in the software and hardware he uses for text to speech.

Meanwhile, only about 5% of Web sites (URLs, or Uniform Resource Locators) are accessible to and useable by people who rely upon screen readers for navigation and access. The vast majority of private sites do not comply with the Web Accessibility Initiative (WAI) guidelines from the World Wide Web Consortium (<http://www.w3c.org/wai>). Some intelligence on the network, e.g., proxy servers, could offer more effective hook-ups for screen readers. It could also perform some text to speech functions. It may be that intelligence in the network might help, too. At any rate, I worry that a dark network limited to transport only might unnecessarily limit access for individuals with disabilities, in this case people who are blind.

Could text-to-speech applications reside in the network? If so, this could greatly simplify Paul's life. He would not need so many costly peripherals and software programs. Access to information would be available to him regardless of where he was (home, office, on travel). And as millions more Americans become blind or develop low

vision in the years to come, their adjustment would be greatly eased. The help they need would be available to them more quickly, more easily, and at lower cost than it now is. It is possible that the needed intelligence is, or will be, at the edges or on the network. What we do not yet know is whether adding it in the network could help – and whether a network-neutrality mandate might foreclose that option.

Myths and Facts

The public Internet is a network of networks. The issue of net neutrality arises with respect to the broadband Internet. Policy makers agree that this is what is meant by the “net” in “network neutrality.” There is less agreement on the meaning of the other word in that term. Nancy Victory, former administrator of the National Telecommunications and Information Administration (NTIA), at the U.S. Department of Commerce, correctly noted that “In the context of Internet policies, however, ‘Net Neutrality’ is used in ways dramatically different from its plain meaning of “‘taking no part whatsoever’.”

Myths

Proponents of net neutrality have made a number of statements that turn out to be erroneous. We need to identify, and explode, these myths before we can continue our dissection of net neutrality.

1. *Myth.* The Internet is now egalitarian. All users have equal access and identical privileges. Mandating net neutrality is key to preserving these vital freedoms.

Fact. This simply is not true. It has not been true for decades. Private networks were deployed by large corporations in the 1980s and 1990s. The T-1 and T-3 lines these companies used connected their offices around the world at what then were thought to be blazing speeds. Today, [Internet2](#) links 200-some universities, 50-odd corporations, and a number of federal agencies at speeds far outpacing those of the public Internet. With Internet2, downloads are 1,000 times faster than on the public Internet. Hofstra is an Internet2 institution, so I have first-hand experience with the unparalleled speed it provides, both upstream (from the end user) and downstream (from Internet sites).

Bottom Line. As those examples illustrate, “equal access” to high-speed connections is an affordability issue, not an engineering one. Equal footing for all comers never has been a feature of the Internet. We cannot lose something we never had. Analogies may help here. When I send something out by surface mail, I have options: overnight delivery through second-day air to standard snail mail. When I fly, I can go first class, business class, or coach. In fact, I can actually choose the level of service I desire, using broadband connections.

2. *Myth.* Control of the Internet should be in the hands of federal officials. We are at risk if owners of the pipes can make allocations of memory and control connection speeds. Specifically, network administrators might speed up user connections to network-owned sites or to sites paying premiums for speed. This claim has been advanced, among others, by Paul Misener of Amazon.com.

Fact. Tim Lee (not to be confused with Tim Berners-Lee), opposes net

neutrality because it would tie the hands of network administrators:

[S]omeone must decide what policies will be made on network equipment. If that decision is taken out of the hands of owners it will inevitably fall to government regulators. That's a recipe for disaster. Network administrators often need to respond in a matter of days, or even hours, to threats and problems on their networks. Government regulators are not known for their nimble and efficient decision making.

Howard Waltzman, counsel for the House Committee, was quoted as saying: "Government is not going to get this right" (in Veigle, 2006). NTIA's Nancy Victory agreed: "[G]overnment action is usually not a precision-guided munition." And the FCC already has in place a policy that appears to meet much of the need. Here it is, in its entirety:

The Federal Communications Commission today [8/5/05] adopted a policy statement that outlines four principles to encourage broadband deployment and preserve and promote the open and interconnected nature of public Internet: (1) consumers are entitled to access the lawful Internet content of their choice; (2) consumers are entitled to run applications and services of their choice, subject to the needs of law enforcement; (3) consumers are entitled to connect their choice of legal devices that do not harm the network; and (4) consumers are entitled to competition among network providers, application and service providers, and content providers. Although the Commission did not adopt rules in this regard, it will incorporate these principles into its ongoing policymaking activities. All of these principles are subject to reasonable network management.

Bottom Line. The independent federal agency with jurisdiction is monitoring network administrators, as it has been. The House bill contains language reinforcing the FCC policy: an amendment passed by voice vote, from Rep.

Wynn, would require service providers to abide by FCC enforcement powers over consumer rights. The bill contains sanctions of up to \$500,000 a day for discriminatory practices. And the underlying bill aims to increase competition in broadband, bringing closer the day when all Americans have a choice of provider. If one network abuses a user's right to surf the 'Net freely, the user may switch carriers, quickly and easily. While one may argue about whether these provisions suffice (i.e., not all consumers have a choice of broadband providers today) and while I respect Mr. Misener's concerns, I am not convinced that mandating net neutrality is the answer, either.

3. *Myth.* The Internet is a public commons. Intelligence and control reside at the edges. Among others, [Free Press](#) has advanced this notion: "The brilliance of this end-to-end network is that the intelligence resides at the edge of the network; the wires in between simply pass information between individual users....Simply preserving the Net as an open commons may be the single best thing we can do to restore public participation in America's 21st-century democracy."

Fact. This, too, is a misstatement. The broadband Internet actually is a network of networks, each of which has owners and administrators. Intelligence resides in the network itself – it has to, for efficient administration – and not only at the peripheries. While network intelligence provides operating functions (e.g., performance), and not content, the fact remains that it is not a commons.

Bottom Line. Here, again, we need to accurately describe where we are. Public policy should be based upon fact, not fiction. The fact is that there already

is some intelligence in the center of the public Internet, especially the broadband Internet. If anyone has been disadvantaged by this, it is news to me. Let us not pine after some Utopian vision of a world that does not exist, and never did. We have intelligence in the network, and the fact is, we need it.

4. *Myth.* Net neutrality is the Democratic position and anti-net-neutrality is the Republican position.

Fact. While the issue appeared to have partisan angles in past months, increasingly it is being considered, properly, as a technical and policy matter. It is too important to be viewed simply in partisan terms.

Bottom Line. The matter of net neutrality, particularly whether Congress should mandate it, is a complex one. It deserves more study than it has yet received. Technology is not partisan, nor should we allow it to become partisan. The issue of network neutrality is complex enough as it is.

Conclusions

The framework of net neutrality has been advanced by some in recent months as being a pro-consumer approach to regulation of the Internet. In fact, at least with respect to persons with disabilities, it may well not be. We just do not yet know enough about the implications and ramifications of the concept of net neutrality. Exactly what behaviors by network owners and administrators would be prohibited? What would be the impact on as-yet-unimaginable new applications (PANS)?

The most responsible conclusion at this time is that in-depth examination is required. The National Institute on Science and Technology (NIST), the FCC, or some other recognized body could convene a blue-ribbon task force to explore these issues. Organizations interested in Web accessibility, such as the American Foundation for the Blind (AFB), the National Association of the Deaf (NAD), and others would be represented on the panel. It would be charged with examining the accessibility of information and communication on the Internet for persons with as well as those without disabilities.

What is indisputable, in my view, is that Americans with disabilities need, and would benefit greatly from, intelligence in the network and not just at its edges. An open and intelligent network may meet the needs of this population much better, at much lower end-user costs, than the dark network sought by some net neutrality promoters. Notably, such current and future “killer apps” as protocol conversion, telepresence, and video signing seem to require intelligence in the network. When complex applications such as these are built into the network, where they are installed, maintained, debugged, etc., by network professionals, the result is greater ease of use and more affordability for end users. For all of these reasons, people with disabilities would be ill-served were Congress to mandate net neutrality without understanding the ramifications of the approach for Americans with disabilities and of its implications for open and intelligent networks.

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