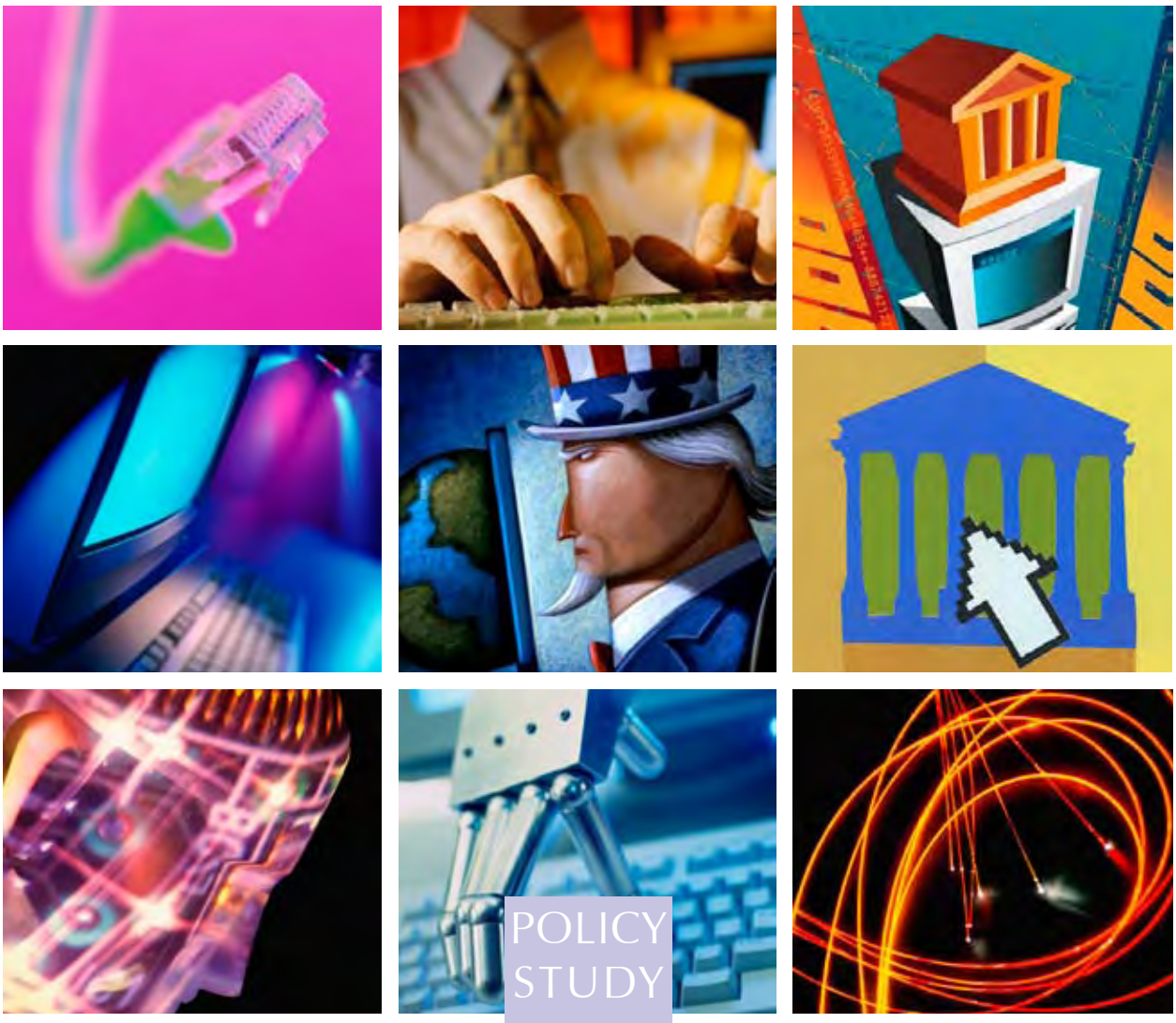
May 2009

The Internet Is Not Neutral (and No Law Can Make It So)

By Steven Titch
Project Director: Adrian T. Moore



POLICY STUDY 375

Reason Foundation

Reason Foundation's mission is to advance a free society by developing, applying and promoting libertarian principles, including individual liberty, free markets and the rule of law. We use journalism and public policy research to influence the frameworks and actions of policymakers, journalists and opinion leaders.

Reason Foundation's nonpartisan public policy research promotes choice, competition and a dynamic market economy as the foundation for human dignity and progress. Reason produces rigorous, peer-reviewed research and directly engages the policy process, seeking strategies that emphasize cooperation, flexibility, local knowledge and results. Through practical and innovative approaches to complex problems, Reason seeks to change the way people think about issues and promote policies that allow and encourage individuals and voluntary institutions to flourish.

Reason Foundation is a tax-exempt research and education organization as defined under IRS code 501(c)(3). Reason Foundation is supported by voluntary contributions from individuals, foundations and corporations. The views expressed in these essays are those of the individual author, not necessarily those of Reason Foundation or its trustees.

Reason Foundation

The Internet Is Not Neutral (and No Law Can Make It So)

By Steven Titch

Project Director: Adrian T. Moore

Executive Summary and Introduction

Under the guise of encouraging competition, protecting consumers and preserving First Amendment freedoms on the Internet, a coalition of corporations and organizations, representing all parts of the political spectrum, have been urging the Federal Communications Commission, Congress and even state legislatures to adopt laws that codify "network neutrality" on the Internet. The latest legislative strategy may be an attempt to impose network neutrality conditions on any service provider that accepts funds from the $7.2 billion broadband stimulus.

Network neutrality would regulate the transmission of Internet data. It would impose obligations and prohibitions on major service providers that own the networks that connect homes and businesses to the Internet. It would dictate the technology and software that phone companies, cable companies and other Internet service providers (ISPs) could develop, purchase and use in their network. It would limit the quality choices they could offer their consumer and business customers. It would lead to a host of unintended consequences, the most immediate and likely being a slow, congested Internet with little or none of the utility for the multimedia applications for which it has become associated.

The principles of network neutrality that would be instituted as law are:

- Carriers should be prohibited from blocking access to any legal Web site or application;
- Carriers should be prohibited from preventing any application using the Internet Protocol (IP), the basic programming language used on the Internet, to run on its network;
- Carriers must allow any IP-addressable device to attach to the network;
- Carriers must provide users with information about their network service plan;

- Carriers should treat all data the same and be prohibited from altering, prioritizing or partitioning data with the intent of improving quality for their own services or for select groups of customers or partners.

The first four principles are all but pointless. First, an ISP exists to connect individuals and businesses to the Internet at large. A service provider who "violates" them would be running counter to its own business model. That's why, in the near 15-year history of U.S. ISP service, there has only been once violation of these guidelines—tiny Madison River Communications, which attempted blocked Vonage's Voice over Internet Protocol (VoIP service). The FCC forced Madison River to halt the blocking and make a $15,000 payment to the U.S. Treasury as part of an agreement to drop the investigation.[1] Beyond that, it was short-sighted. VoIP services are popular and ISPs, to keep their business, find they must support them.

The second and third principles are beyond ISP control. By definition, any IP-compatible device can communicate over an IP network. This is simply the way the equipment works. An ISP can't do anything about it. Now an ISP may require a password if a customer wants to use the portion of the network it owns to connect to other devices, but a password requirement does not interfere with the IP connection itself. Just getting a password prompt is proof an IP device is operating on the network. And ISPs are not the only businesses who use passwords protect their networked assets. Most businesses and consumers, if they are wise, password-protect any laptops, PCs and larger computers that connect to the Internet. That's precisely because any IP device can talk to another.

The fourth principle is redundant. Information about service is covered in the basic buyer-seller agreement. And if an ISP were to violate it to the point where a consumer or business owner thinks he's been defrauded, there are existing legal mechanisms to address those cases.

So while any Internet regulation is undesirable, the initial four neutrality provisions don't really "safeguard" anything. They have the same effect as would a decree that required every motor vehicle built in the U.S. to drive forward and reverse. Law or no law, cars are going to be built that way.

The fifth principle, however, would hold serious consequences if given the force of law. The fifth principle of network neutrality would impose limits on how service providers can use their networks to improve the quality, reliability, prioritization and management of data and applications as they move across their facilities. Specifically, phone and cable companies, along with ISPs such as EarthLink and Covad Communications that predominately serve businesses, would be prohibited from offering Web site owners (sometimes called Web hosts), ranging from companies the size of Google to small entrepreneurial Web storefronts, any improvement in applications speed or performance for an added price.

Network neutrality proponents say regulations are needed because the phone and cable companies control most consumer connections to the Internet. As an example, they point to Comcast, the nation's largest cable company, which in October 2008 confirmed reports that it was intentionally

slowing down the rate that voluminous video files were being transferred to BitTorrent.com, one of many so-called peer-to-peer (P2P) sites that allow users to search for and exchange movies and TV shows between and among their own PCs. Although an Associated Press (AP) headline reported that Comcast was blocking P2P applications, the text of the very article reported otherwise.[2] BitTorrent software is designed to set up as many simultaneous connections as possible between the user's PC and BitTorrent's file sharing site (the more connections, the faster the transmission). To keep BitTorrent users from flooding the network, especially at peak times, Comcast introduced software that limited the number of simultaneous connections the BitTorrent software could set up. BitTorrent users could still reach the site, but the rate of transfer was slowed. Comcast argues this network management decision was made to ensure service quality for the vast majority of Comcast Internet customers whose high-speed connections would be slowed by the amount of bandwidth P2P applications were gobbling up. Even cable industry critics such as George Ou, writing on ZDNet, conceded Comcast was within its rights to do so:

> *We can think of it as a freeway onramp that has lights on it to rate limit the number of cars that may enter a freeway… If you didn't have the lights and everyone tries to pile on to the freeway at the same time, everyone ends up with worse traffic.*[3]

The Comcast action, triggered with the reality that P2P protocols such as the BitTorrent protocol are designed to consume as much bandwidth as is available, has sharpened the debate about what the unintended consequences of network neutrality might be. If network neutrality were enacted as bills are currently written, service providers would not be able to take technical countermeasures that would balance bandwidth consumption. Conversely, they would not be allowed to offer rabid P2P users priority connections a higher price. And whether they charged for it or not, service providers would not be able prioritize transmission of certain types of data, for example, streaming video or online gaming, even if it would make the application perform better. They would not be allowed to enter agreements with third party providers to give their services special handling. They would not be permitted to improve the quality of their own services, such as Voice over Internet Protocol (VoIP) phone calling, without providing the same level of quality to competitors who use their network.

As such, network neutrality enforcement would add an unprecedented level of government interference in the way Internet applications work, and to what extent the sophisticated transmission mechanisms within the Internet could be used to facilitate future Web applications such as telemedicine and distance learning, as well as entertainment and e-commerce. And even then, it is doubtful whether network neutrality can ensure the "equal access" proponents say they want. It is also questionable whether a policy of network neutrality is either workable or desirable on today's Internet.

Network neutrality proponents state that without neutrality, service providers will be able to create high-speed "toll" lanes on the Internet, and relegate those without deep pockets to some sort of "slow" lane. These suppositions are presented with no evidence. Today, the Internet reaches the customer at speeds as high as 15 megabits per second (Mb/s), hardly pokey by any measure, and there's every reason to believe speeds will get faster. The norm was 4 Mb/s in 2005, and 8 Mb/s in

2008, while prices have remained stable. All this has come about without mandated network neutrality

As justification for a ban on service providers creating differentiated pricing for faster data speeds or guarantees of higher quality, supporters cite the historical classification of network owners as "common carriers," a status which they say obligates them to treat all data the same.

The "common carrier" rationale no longer holds. True, only a few years ago, telecom networks were neutral common carriers by default. Two things changed. First, the Internet and broadband together enabled an unlimited number of parties to use the network to deliver diverse content, applications and services. Second, network technology evolved to the point where service providers could manage, manipulate and prioritize data in their networks in ways that can add greater value.

Although neutrality proponents routinely compare telecom networks to utilities like electricity and water, the concept of the "value-add" is a critical distinction in telecom. The common carrier argument sees only a raw data stream crossing the network. It's a clever twist, because it's easy to comprehend data—all those one and zeros—flowing to homes much like electricity and water. But the analogy ends there. Consumers don't use their Internet connections to receive a stream of digits; they use them to find, purchase and exchange data in the form of *processed information*, be it a simple e-mail or a high-definition movie.

Network neutrality mistakenly assumes that service providers deliver commoditized data when, in fact, they deliver packaged information products that have been created and crafted by numerous parties.

Processed information, as opposed to raw data, can take many forms, and can be valued using any number of measures. To the user, therefore, the Internet, as a delivery mechanism, is inherently commercial and non-neutral. As a party to an information-based transaction, the consumer implicitly accepts that the enterprises that have invested in the creation, processing, transmission, presentation and sale of that information are entitled to compensation.

Network neutrality would lock service providers out of the process. It would prohibit the companies that build, own and operate the nation's broadband networks from taking any strategic role in the management and optimization of information products that use their facilities, to the detriment of everyone who depends on a high-performance Internet. Network neutrality would pre-empt the development of an entire class of optional, but valuable, products, features and services that would make for a better network. For example, any application that has life or death implications and calls for real-time communication—say a remote home-based health monitoring system linked to emergency alarms at a hospital, would benefit from, and perhaps require, transmission prioritization.

In fact, the capability to do so already exists. Hospital networks, which use the very same IP protocol as the Internet, can and do prioritize traffic. So do many other businesses and organizations that do business over the Internet.

In fact, as we shall explore further in this report, the Internet is not, and never has been, neutral. Nor will a network neutrality policy make it so. All it will do is place legal limits on the quality and performance of Web-based services. Neither federal and state legislators, nor FCC commissioners, will serve the users or Internet economy if they go out of their way to remove an entire group of companies from the information value chain.

This paper examines the goals of network neutrality and demonstrates how they are based on misperceptions about how the Internet works, how consumers make use of it, and how other enterprises purchase and use tools that improve Internet and Web performance. It also examines the unintended consequences that could result if Congress and regulators are successful in their pursuit of this policy.

Table of Contents

Part 1

Current Network Neutrality Legislation and Regulation

A. Congress

The most sweeping example of network neutrality legislation can be found in the Internet Freedom and Preservation Act, co-sponsored by Olympia Snowe (R - Maine) and Byron Dorgan (D - N.D.). It was introduced in the 109th Congress in June 2006, and reintroduced in the 110th Congress in January 2007. It has yet to be reintroduced in the current session, although there is reportedly considerable support for network neutrality among the Democratic majority.

In light of the $7.2 billion the federal government plans to allocate to stimulate broadband growth, the push for network neutrality may not come from a new bill, but may be attached as a condition for any company that chooses to accept stimulus funds. The question has been up for debate as the Departments of Commerce and Agriculture, which will allocate the funds, have been holding hearings on their dispensation.

Whether Congress reintroduces legislation, or attempts to fold network neutrality conditions into funding initiatives, the Snowe-Dorgan bill will likely be the regulatory model. Therefore it is worth examining and critiquing.

Under the heading "Internet Neutrality," it states:

> (a) DUTY OF BROADBAND SERVICE PROVIDERS—With respect to any broadband service offered to the public, each broadband service provider shall—
>
> (1) not block, interfere with, discriminate against, impair, or degrade the ability of any person to use a broadband service to access, use, send, post, receive, or offer any lawful content, application, or service made available via the Internet;
>
> (2) not prevent or obstruct a user from attaching or using any device to the network of such broadband service provider, only if such device does not physically damage or substantially degrade the use of such network by other subscribers;

> (3) provide and make available to each user information about such user's access to the Internet, and the speed, nature, and limitations of such user's broadband service;

These first three provisions embody the current FCC guidelines regarding neutrality. Service providers may not block access to Web sites; they must permit an IP-compatible device—such as a PC, cell phone, BlackBerry or WiFi card—to connect to the network and must provide information on the state of the connection, a capability that is easily accessible from a PC's own operating system software.

As noted earlier, these provisions are equivalent of legislation that requires auto makers to produce cars that go forward and backward. While they nominally protect consumer interests, it would be against the service provider's interest to violate them. A service provider who actively blocks access to the entire wealth of available Web sites without consent of the user will fast lose customers. Who wants to do business with a company that goes out of its way to diminish the Internet experience?

At the same time, some users may want to choose network-based services that filter e-mail spam or harmful viruses, block access to so-called fraudulent "phishing" sites designed to mislead the user into disclosing credit card or social security numbers. Parents may want a service that blocks access to adult sites. PC software is available for these purposes, but they often require purchase of a subscription to keep the list of blocked sites current or force the user to regularly update the list him- or herself. Although an ISP could provide a competitive, desirable alternative service that a user might find easier to manage, because it would involve blocking Web sites and applications, network neutrality would prohibit it from doing so. The user loses.

The next group of Snowe-Dorgan provisions goes beyond the FCC rules and introduces government intervention into the economics of the Internet.

> (4) enable any content, application, or service made available by the Internet to be offered, provided, or posted on the basis that—
>
> (A) is reasonable and non-discriminatory, including with respect to quality of service, access speed and bandwidth;

This can be construed as the "No deals with Google" rule. This would prohibit any service provider from offering a higher degree of quality of service or other differentiation in terms of speed, bandwidth or service to a third-party applications provider.

> (B) is at least equivalent to the access, speed, quality of service, and bandwidth that such broadband service provider offers to affiliated content, applications, or services made available via the public Internet into the network of such service provider;

This is the converse of 4 (A). This clause essentially states quality levels offered to one must be offered to all. Together, 4 (A) and (B) relegate the carrier networks to being "dumb pipes," prohibiting them from using any of their own network technology from adding value to customer traffic.

> (C) does not impose a charge on the basis of the type of content, applications, or service made available via the Internet into the network of such broadband service provider;

This drives home points (A) and (B) by explicitly prohibiting service providers from monetizing their ability to manage and prioritize complex applications as they move across the network.

> (5) only prioritize content, applications, or services accessed by the user that is made available by the Internet within the network of such broadband service provider based on the type of content, applications, or services and the level of service purchased by the user, without charge for such prioritization;

This is the "end-user pays" clause. In almost direct contradiction to the preceding clauses, it coyly recognizes that prioritization of certain applications is desirable. But it requires carriers to place the cost of the management needed for the delivery of theses services squarely on the shoulders of users.

> (6) not install or utilize network features, functions, or capabilities that impede or hinder compliance with this section.

This can be read as a prohibition on service providers against making their networks work better, investing and monetizing their investment. This clause essentially dictates what carriers can and cannot do with their private property.

In February 2008, Reps. Ed Markey (D - Mass) and Chip Pickering (R - Miss.) introduced The Internet Freedom Preservation Act of 2008 (H.R. 5353). The bill called for an FCC investigation into service provider network management practices and would make it U.S. policy "to guard against unreasonable discriminatory favoritism for, or degradation of, content by network operators based upon its source, ownership, or destination on the Internet."[4]

Another bill, introduced in the House in May 2008 and co-sponsored by Reps. John Conyers (D - Mich.) and. Zoe Lofgren (D - Calif.), would subject broadband providers to antitrust violations if they block or slow Internet traffic.

B. The FCC

Julius Genachowski, President Barack Obama's nominee as chairman of the FCC, served as technology advisor to Obama's campaign, which took a pro-network neutrality position. However,

there is little on the record as to where Genachowki himself stands on the issue and how high a priority he regards it. As of May 2009, he was awaiting Senate confirmation.

Genachowski's predecessor, Kevin Martin, had signaled on numerous occasions that he favored allowing the market to follow consumer preferences to determine the degree of network management and applications prioritization that might be necessary or desirable. And, as noted, the FCC adopted network neutrality guidelines in 2005 that cover all principles except the ban on prioritizing content and applications or improving quality in return for compensation.

However, in return for approving the merger between AT&T and BellSouth, the FCC extracted just such a concession, to which AT&T agreed in order to break a 2-2 deadlock among Republican and Democratic commissioners that had been delaying action for several months.[5]

Yet the deal contained some curious provisions of its own, which seem to betray some second thoughts on the part of the commissioners about the wisdom of network neutrality. First, the FCC agreed to exempt AT&T's wireless and video operations, which seems to signal that it believes there are certain areas where transmission prioritization is required for applications to work properly and where content partnerships are good for consumers. There is also a 30-month expiration date, which will be reached in June, for wireline Internet neutrality, which essentially lets AT&T return to the terms of the current FCC neutrality rule. For all the importance network neutrality advocates attach to the issue, free market observers such as Timothy Lee of the Show-Me Institute, were left scratching their heads over what, if anything, had changed.

> *[T]he distinction drawn in the rule doesn't make a whole lot of sense. [AT&T is] not allowed to discriminate except "for AT&T's new TV service." But AT&T's new TV service involves streaming various companies' video content using [IP], right? So how is that different from the type of discrimination the regulation is designed to prevent? I thought video was always considered the biggest area of concern when it comes to ISP discrimination. I don't see what's to stop them from effectively selling companies the right to be part of "AT&T's new video service" and having the same effect as selling higher-bandwidth pipes.*
>
> *It also seems that the 3-year timeframe renders the regulations as little more than a symbolic exercise. If AT&T were planning to abandon network neutrality on its networks, it would probably take them a year or two to install the necessary infrastructure. So it's probably not a big deal for them to put the equipment in place in late 2008, ready to flip the switch as soon as this deal expires.*[6]

As the FCC was negotiating its concessions with AT&T, William E. Kennard, FCC Chairman under President Bill Clinton, wrote,

> *The nation should have a full-scale policy debate about the direction of the broadband Internet, especially about how to make sure that all Americans get access to broadband connections.*
>
> *Unfortunately, the current debate in Washington is over "network neutrality"—that is, should network providers be able to charge some companies special fees for faster bandwidth. This is*

> *essentially a battle between the extremely wealthy (Google, Amazon.com, and other high-tech giants, which oppose such a move) and the merely rich (the telephone and cable industries). In the past year, collectively they have spent $50 million on lobbying and advertising, effectively preventing Congress and the public from dealing with more pressing issues.*[7]

Alfred E. Kahn, who was a key advisor to the Carter Administration on deregulation of the airline industry, was also skeptical.

> *By far the most promising intensification of that competition is the tens of billions of dollars that the phone companies themselves are spending converting copper to fiber, which will enable them to offer video programming pervasively, in direct competition with the cable companies. Can anyone seriously believe that competition would be forthcoming if those incumbents were still subject to public utility-type regulation? Or prevented from surcharging the heaviest content suppliers—the ones demanding the speediest possible access to subscribers that those telco investments will make possible?...*
>
> *Why all the hysteria? There is nothing "liberal" about the government rushing in to regulate these wonderfully promising turbulent developments. Liberals of both 18th and 20th—and I hope 21st—century varieties should and will put their trust in competition, reinforced by the antitrust laws—and direct regulation only when those institutions prove inadequate to protect the public.*[8]

What lies behind these separate thoughts? Perhaps a true understanding of the way today's Internet really works and the way people use it.

Part 2

The Myth of the Neutral Internet

The strongest argument against mandated network neutrality is that the Internet itself is not neutral. A chief reason network neutrality proponents concentrate on the First Amendment issues involving the Internet is because it shifts discussion away from the commercial aspects of the Web, where management and optimization are critical to the quality of service.

There is no doubt the Internet has proved an unprecedented tool for the dissemination of thoughts and ideas. It has also proved an unprecedented extension of the marketplace. As such, the laws of supply and demand have applied since its initial development. If there was ever a time where everything about the Internet was neutral, it was the early university years when all communication and commands were text-based. That changed when the first browsers were introduced—graphical user interfaces brought an end to nominal Internet neutrality because they allowed information to be presented in a whole new way. That was good! They were groundbreaking tools that improved the Internet experience. Since then entrepreneurialship, what neutrality proponents pejoratively call "deep pockets," has been giving users and Web hosts more and more tools that help them gain an advantage over others in delivering and presenting Internet- and Web-based information.

A. Network Neutrality and End-to-End Principle

The central tenets of network neutrality derive from two related legacy factors that existed at the time of the Internet's creation. The first factor was that the narrowband networks that carried IP traffic at the time were, by nature, neutral. While they could switch and route data packets, they could not discern the type of information they were carrying. Nor could they modify it, prioritize it or manipulate it in anyway to ensure it reached their intended destination. IP devices relied on the terminal equipment at either end of the connection to do the work. That's why IP is often referred to as "best effort," which means the transmitting device keeps sending packets until the receiving device signals back that it has received them.

That influenced the second legacy factor—the "end-to-end principle"—which called for most of the transmission intelligence to be designed into the equipment at either end of the connection—the so-called "edge" of the network. This was the rule when Tim Berners-Lee and his colleagues at CERN in Switzerland developed the World Wide Web in the early 1990s. Naturally, they wrote the

language of the Web, including the hypertext mark-up language (HTML), the hypertext transfer protocol (HTTP) and the various other signaling formats to work within the equipment at the edge. After all, the phone connections at the time were nothing more than end-to-end circuits.

For consumers using the broadband connections to the Web, the end-to-end principle remains largely the rule today. On the user end, browsers like Internet Explorer and Firefox manage most of the Internet communications and processing, assisted by video and audio players, like Real Player and iTunes, and "plug-ins" like Flash. At the server end, operating systems such as Unix and Windows NT handle the large scale processing needed to run corporate Web sites. Encryption, firewalls, data compression and other processes related to transmission are handled by software at the point of connection. For consumers, the end-to-end principle embraced by network neutrality indeed appears to be the way the Internet is supposed to work.

But in the network processes behind what consumers see and experience, the end-to-end principle has been breaking down for some time. As far back as 15 years ago, as businesses began to use the Internet for their internal enterprise networking, they wanted greater quality control, reliability, prioritization and encryption in their national and global communications networks. Hence, intelligence began to extend from the network edge into the "core"—the portion of the network owned by the phone companies. A new alphabet soup of protocols and formats, such as the Multiprotocol Label Switching (MPLS), the Session Initiation Protocol (SIP), the Simple Object Access Protocol (SOAP), emerged in the mid- to late-1990s and the early part of this decade specifically designed to give service providers tools to improve quality, reliability and management of IP data as it crossed the Internet. These quality services were in turn sold to enterprise customers in the form of "Good, Better, Best" quality tiers. As it is wont to do, the industry adopted its own term to describe the process—quality of service, or QoS.

The introduction of QoS pushed IP transmission beyond "best effort." Moreover, QoS was a hook service providers could use to compete against companies such as IBM, EDS, Hewlett-Packard, Sun Microsystems and Cisco Systems, which built their business plans around the end-to-end principle that kept the carriers—and their "dumb pipes"—at arms length from their enterprise customers. Armed with QoS, the phone companies were able to approach these customers directly with competitive networking solutions and become more successful in selling services directly to large enterprises because they were cheaper and, to the user, far less labor-intensive.

A similar shift, in the consumer market, lies at the heart of the network neutrality battle. Only this time it's applications companies like Google, Yahoo, eBay, and media giants like Disney and Sony that have a vested interest in maintaining the end-to-end principle. The only difference is that, unlike their forebears in the enterprise networking sector, rather than adapt to a changing market, they have been brash enough to seek legislation that protects and codifies the technology conditions on which they base their original business models.

The current crop of content and applications companies have the most to lose if, in the realm of bandwidth-rich Web and new media applications, technology and market evolution push

intelligence away from the edge and into the network core. Under network neutrality, these big companies can draw as much bandwidth and processing power from the network as they need to deliver their high-value services without having to bear any of the costs.

There is no question network neutrality will serve the interests of one segment of the online information and applications supply chain. Whether it will serve consumers, the market and the public interest is questionable indeed.

B. The End of the "Common Carrier"

For most of their history, telephone and cable companies were regulated as common carriers. The legal definition of a common carrier is:

> *...[a] company, including telephone and railroads, which serves the general public and is required by law to provide service to any paying customer as long as government rules and regulations are met.*
>
> *Any organization which operates communications circuits used by other people. Common carriers include the telephone companies as well as communications satellite owners, AT&T and others.*[9]

Network neutrality regulation is predicated on holding phone and cable companies to the common carrier definition. Here's the net neutrality argument as set forth by two strong supporters, Art Brodsky, a telecom journalist and analyst:

> *Net Neutrality is the simple idea that the companies which operate telecom networks, like telephone and cable companies, shouldn't be able to have control over content by playing favorites, whether with affiliates or through companies which cut special deals. The telephone network operated for 71 years under a non-discrimination policy, which the FCC lifted last year for high-speed Internet services.*[10]

and Free Press, a non-profit media activist group:

> *The process of network prioritization is a zero-sum game. The fact is that every time one Web site or service is sped up, another must be slowed down. Who will be in the slow lane? Anyone without the cash or the connections to negotiate fast lane deals with every network operator in the country (each of which has their own regional fiefdoms). Basically, anyone that lacks deep pockets or high volume will be relegated to the slow lane, while the big corporate Web sites will gain premium treatment, capturing a larger percentage of users by virtue of their higher quality of service.*[11]

The problem is the case for network neutrality is built entirely on supposition that a non-neutral Internet is a bad thing. Network neutrality legislation does not aim to correct any neutrality abuse that exists. Even as proponents concede that neutrality elements are breaking down, they can't point to a specific instance of consumer or business harm through applications prioritization or

QoS. Thus the fallback position argues that network service providers are common carriers and, therefore, are obligated to be neutral.

But legislators should be careful about attempts to impose aspects from common carrier history on the delivery of services and applications via the Internet. Participants on all sides of the debate are fond of extending common carrier analogies to the Internet. The Internet is like the highways, they say. Or the Internet is like the railroads. Or the Internet is like electricity and water. There are similarities. But perhaps it is just as important to spotlight the differences, especially before embarking on a regulatory course that relies too much on common carrier analogies.

Railroads and highways (or, more accurately, trucking companies) do not add value to the goods that are transported over them. They are third parties contracted to move material goods point-to-point through physical space. Beyond speed and efficiency of delivery, they have no means of adding to or changing the value of the product. The rates they charge are based on the inherent costs of carriage—usually weight and volume—not the value of the good being transported. To be sure, the method of transportation can have an impact on the condition of a product when it arrives at its intended destination—perishable items can spoil and fragile items can be damaged—but the basic nature of the product cannot be improved by transportation by common carrier. A standard DVD shipped from a warehouse cannot become a Blu-ray DVD by the time it arrives on the doorstep.

With electricity and water, the infrastructure is merely a conveyance, although the "network" and the product are tightly coupled. There needs to be a specialized degree of infrastructure to generate and transport electricity and another to transport clean water. The cost of the product and the infrastructure used to deliver it are often rolled into one rate. Until recently, the company that generated the electricity or managed the water resources also owned and managed the delivery network.

But even where electricity competition and water privatization have been introduced, differentiation is usually based on price. No competitor has made electricity "better" in that it lengthens the life of light bulbs, or can produce the same cooling or heating output for less kW consumption. Quite the opposite, the user depends on the energy efficiency of the equipment—better air conditioners, or fluorescent lighting instead of incandescent—to derive more value from the energy dollar.

Data bitstreams—and the networks they travel—are different from railroads and electric grids. Unlike cargo, packets of information do not exist in physical space. They can move around the world at the speed of light via any number of routes at very little cost.

Data consists of binary electronic or optical pulses—ones and zeros. However, they have independent value that derives from the content or application that all those ones and zeros represent when processed by the right equipment or software. Routers, PCs and other information

appliances in the home or workplace are designed to take specific data and convert it into something of value that transcends its base digital format.

Network neutrality is flawed because it fails to account for the simple fact that the Internet is a transport media for content and applications, not raw data. By insisting that all data be treated the same way as it crosses the network, it fails to recognize the value of the content and application contained in the bitstream. This is the grand irony of network neutrality. Since the Internet was conceived, computer scientists, inventors and entrepreneurs have been working to make it as robust as possible to handle diverse content and applications. Service providers have a role here, because their networks contain intelligence that can be used to shape and improve applications. Network neutrality would preempt this.

Given the capabilities broadband networks offer, regulators must ask whether it is truly in the public interest to hold them to a strict doctrine of non-discrimination. There has been no instance of carriers using network intelligence to block or interfere with competitors. True, they are using their proprietary resources to offer a level of service for those with the means to pay, but this is not inherently unfair. In any other industry—including information technology—this is a legitimate business practice that can help the consumer. First it allows low-volume users to be offered prices that better reflect the amount of bandwidth they use. It allows carriers to customize service and applications for high-volume users. Finally, it allows carriers to use their network technologies in tandem with application providers to create new types of consumer and business services that require tight-knit close interaction between the equipment at the edge of the network and in the core.

C. The End of the Local Exchange Bottleneck

Another fallback position among net neutrality proponents is that service providers "control" the local bottleneck and are therefore in a position to act as arbitrary gatekeepers of Web content. Because most markets have but two broadband service providers—a phone and cable company—proponents say an exploitive duopoly exists with unchecked power to use quality and optimization services determine "winners" and "losers" among Web applications providers.

But this is not happening. Telephone and cable companies do not monopolize Internet services, especially at the server side, where the market for optimization truly exists. A hosting company or business has an enormous choice of carriers from which it can purchase capacity. These include the local phone company but also firms such as Level 3, Covad Communications, McLeodUSA, 360Networks and Cogent.

In this environment, broadband service providers such as AT&T and Comcast have no duopoly to leverage. If they were able to offer quality optimization in the free market, as a baseline, they would still have to be competitive with network optimization services from companies like Akamai

and Savvis (see section below). If applications providers thought they were being exploited, they could switch carriers or adopt a server-based management solution.

On the customer access side, competition has been the rule for ISP services since the market's inception. While many ISPs once leased lines from local phone companies, that is not the case now. Facilities-based competition—cable modems vs. DSL—has reached most markets. Finally, although not as robust as wireline platforms, wireless access is making legitimate market inroads as an economical Internet access mechanism. Wireless services can be purchased for as little as $20 a month. Verizon, AT&T, T-Mobile, Alltel, and others offer cellular broadband. Plus there are numerous regional and local wireless ISPs, which, with the growing sophistication of intelligent wireless devices such as the iPhone and BlackBerry, are asserting themselves as full-fledged broadband alternatives.

D. Other Non-Neutral Internet Technology

The argument for network neutrality further breaks down when one considers that much of the other technology routinely used by Internet users results in different levels of experience with service and applications.

1. Bandwidth

Let's start with something as simple as bandwidth. Internet bandwidth, measured in terms of kilobits and megabits per second, affects the quality of the Internet experience. Internet access is not neutral. Those who can afford more bandwidth get a better experience. Wireless access at 1 Mb/s can cost as little as $15 a month. Most telephone companies sell DSL service in bandwidth tiers, from 1 Mb/s to 6 Mb/s, ranging from $25 to $50 a month. Cable modems, which can deliver up to 15 Mb/s, top out at about $60 a month. The consumer's choice of bandwidth balances budget and needs. But there is a clear difference in the wait times and/or quality in video received at 1 Mb/s or 15 Mb/s.

Web site owners have the same cost choices and trade-offs. Someone with a small business, or a simple blog, may elect to purchase shared bandwidth capacity from a local ISP. A person or company doing regular business may elect to own a server with a leased T-1 (1.5 Mb/s) connection. Sites that must handle a great deal of traffic may have multiple T-1s or even T-3s (45 Mb/s). Again, the amount of bandwidth the customer is willing to purchase affects the performance of the Web site. Customers for whom greater bandwidth is a higher priority and who can purchase greater bandwidth will—and should be able to—purchase it, just as some car customers will choose to spend more money to purchase a high-performance sports car rather than a simple sedan. In this way, customers should be able to tailor their bandwidth to their desires and budgets, rather than regulations determining what they can and cannot purchase. There is no law, nor should there be, restricting every Web site to a fixed amount of bandwidth.

2. Personal Computers

PCs have as much a role in the quality of the Internet experience as servers and software. The user may have a 100 Mb/s connection, but it would hardly matter if her PC was five years old, ran Windows 98, used a 300-MHz processor and relied on a 200-megabyte hard drive. This wouldn't be enough processing power, speed or storage to make use of the applications that the high-speed connection would offer. The user would need a better operating system, not to mention video, graphics and sound cards. Browse through any PC catalogue and you'll see that a faster processor, a more sophisticated operating system and higher capacity storage all carry higher costs. These same factors affect the server side. The individual seeking a Web presence is faced with number of choices, each carrying a corresponding difference in price. Shared space, or a dedicated server? Unix or Windows NT?

Again, individuals and enterprises with greater resources can use them to create a superior Internet experience. As with bandwidth, no one is demanding Congress set limits on the power and capabilities of PCs and servers that connect to the Internet. Nor should they.

E. Discriminatory Networks within the Internet

The use of networked servers in applications delivery is a sophisticated technological concept, but is important to understand because it demonstrates that a legitimate and thriving market for content and applications prioritization exists.

Network neutrality proponents were appalled when the service providers said they were planning to charge for optimizing applications. This statement by Ed Whitacre, CEO of AT&T, touched off the current net neutrality debate, when he said of Internet content providers: "They use my lines for free—and that's bull. For a Google or a Yahoo or a Vonage or anybody to expect to use these pipes for free is nuts!"[12]

Later, John Thorne, a senior vice president at Verizon, expressed a similar thought.

> *The network builders are spending a fortune constructing and maintaining the networks that Google intends to ride on with nothing but cheap servers. It is enjoying a free lunch that should, by any rational account, be the lunch of the facilities providers.*[13]

These assertions were viewed as a telephone company effort to somehow force Internet content providers to pay for something they shouldn't have to. In truth, companies can, and do pay vendors to improve delivery and performance of their Web-based content.

Google's Impact on the Internet

The nation's premier supporter of network neutrality, Google, maintains more than 450,000 Web servers in 25 locations across the country. Microsoft maintains more than 200,000. And even that estimate, made in 2006, was a "best guess" in *The New York Times*.[14]

The article examined a huge data center Google set up in The Dalles, Oregon, and provided an illuminating look at how Google, along with Microsoft and Yahoo, are rapidly expanding their own Internet operations.

> *And odd as it may seem, the barren desert land surrounding the Columbia along the Oregon-Washington border—at the intersection of cheap electricity and readily accessible data networking—is the backdrop for a multibillion-dollar face-off among Google, Microsoft and Yahoo that will determine dominance in the online world in the years ahead.*[15]

A justification for supporting network neutrality is the assumption that network owners—AT&T, Comcast, et al.—have an infrastructure monopoly on the Internet. How can this be true when, together, Google and Microsoft own more than 650,000 Internet servers? Within five years they will own more than a million between them.

"The remarkable social impact and economic success of the Internet is in many ways directly attributable to the architectural characteristics that were part of its design. The Internet was designed with no gatekeepers over new content or services," declared Vint Cerf, one of the Internet's pioneers and now chief Internet evangelist for Google.[16]

That indeed is true. But with all due respect to Cerf, it is foolish to believe that when one company places 450,000 servers on the Internet, which Google has done, it will not profoundly affect those "architectural characteristics." The Internet that network neutrality laws want to "preserve" no longer exists. Google and its competitors are just the latest companies to have fundamentally changed it.

Akamai Technologies is the global leader in providing technology for accelerating the delivery content and business processes online as demand warrants. It operates a network of some 15,000 servers worldwide. Its Web site[17] touts some of the most, dare we say, deep-pocketed, corporations in the world—IBM, Apple, Audi, the European Broadcasting Union and, according to a recent press release, Sony Consumer Entertainment (SCE).

> *In addition to providing cutting-edge delivery services to Japanese companies that offer online game content, such as SCE, Akamai's global platform is being leveraged in Japan to drive the commercial use of the Internet—in an era of rich content—by providing delivery services optimized to meet the particular needs of companies in a variety of fields including image-*

> *delivery services, financial services, food and beverage services, cosmetics, and multimedia…Akamai's dynamic content delivery capabilities also ensure high performance and reliability of dynamically-rendered, personalized Web content.*[18]

While Akamai is a leader, it is not alone in this market. Competitors include Kontiki, Inc. (now owned by VeriSign), Mirror Image Internet and Savvis. Large content and applications providers purchase their technology and services to make their Web sites function better. In essence, these companies create tight-knit server networks within the larger Internet that partition off these bandwidth-rich, error-sensitive applications—exactly the type of service that AT&T's Whitacre was excoriated for proposing.

The market for partitioning, prioritization and optimization of Internet data exists. Customers who buy services from Akamai and its 21 competitors pay for a higher level of quality and optimization in Internet delivery than those who don't.[19]

This is not trivial to the debate. Remember, the basic premise for network neutrality is that the Internet, by nature, is neutral and that allowing service providers to monetize their ability to optimize applications somehow corrupts its essential nature. That Akamai and companies like it have made a successful business out of content and applications optimization is just another fact that belies this assertion. The market—businesses and consumers—has consistently responded positively to any improvement in the management and the delivery of Internet applications. It validates the argument that broadband providers should be compensated for the extra cost of managing the transmission of profitable applications that move through their networks.

F. Non-Neutral Business Models

The examples up to now have shown ways that the technology and services within the Internet are non-neutral. But since network neutrality seeks to regulate business relationships—Paragraph (4)(B) of Snowe-Dorgan prohibits service providers from giving favorable terms and conditions to subsidiaries, partners and other third parties with whom they might form a contractual relationship—it is worth showing how many of today's Internet business models are non-neutral.

The use of a partnership or agreement to gain a competitive advantage is established business practice, no less so on the Web. And it's a tactic embraced by some of network neutrality's strongest supporters.

For example, in May 2006, *The Wall Street Journal* reported that Yahoo agreed to be the exclusive third-party provider of all graphical advertisements on the eBay site. For Yahoo, it's a big win against Google, its major competitor.[20]

Under the Yahoo-eBay arrangement, if you want an ad on eBay, you've got to broker it through Yahoo. But network neutrality would prohibit service providers, which own the pipes that carry

Yahoo's and eBay's paid advertising, from using similar business models to expand their own broadband opportunities.

The *Journal* article also reported that the two companies will work together to develop "click-to-call" advertising technologies, which will allow a user to click on an ad banner and trigger a VoIP call to the advertiser. This is the exact type of application that can benefit from a level of management above and beyond "best effort" Internet, but that network neutrality would thwart. While a network neutrality law would allow Yahoo to be the exclusive provider of eBay ads, it would prevent a phone company from joining the agreement to guarantee the connection and quality of the VoIP traffic for those click-to-calls. Hence, an opportunity to improve the online experience for consumers through innovative combination of technology and respective core company strengths is regulated away.

G. What about the First Amendment?

Different applications call for different transport mechanisms—and this is where the First Amendment argument breaks down. Let's examine the basic criticism by using an example posed by a columnist in the *Madison Capital Times*. A neutral Internet, he writes, would not block either Wal-Mart.com or Wal-Mart Watch.com. The question becomes more difficult, he says, when "the average Internet user could get to Wal-Mart's site in an instant but would have a hard time getting to Wal-Mart Watch's site."

Let's leave aside a moment what is meant by a "hard time" and take the example in the spirit in which it's intended: At the core is the assertion that it would be fundamentally unfair, to the point where it violates Wal-Mart Watch's rights of free speech, for Wal-Mart to be allowed to use its resources to create a web site that loads faster than Wal-Mart Watch's.

So the proposed solution is to prohibit phone and cable companies from offering "toll lanes"—traffic prioritization and management, that Wal-Mart could afford and presumably, Wal-Mart Watch couldn't.[21]

But traffic prioritization is not the only factor in Web site quality. As we've seen, Web technology is not neutral. Wal-Mart already can afford better navigation tools, better payment options and more servers closer to users. From the beginning, its web site was never functionally equivalent to Wal-Mart Watch's.

Net neutrality advocates are reading more into the First Amendment than is there. They are not merely calling for no blocking, they are demanding equality in terms of the end-user experience. Those characteristics have always been beyond the scope of First Amendment and free speech. The government cannot censor what you want to say, but it is not obligated to provide you with a printing press.

In the print world, a wealthy pamphleteer can go to Kinko's and get a higher quality print job. He can hire a designer and get some colorful illustrations. This may make his content more compelling, and even more persuasive, but it in no way abrogates the rights of a rival pamphleteer whose limited means force him to stick to black-and-white text.

The same principle applies in the Web. What's more, the "virtual printing press" the Web offers is far less expensive than a mechanical one. Still, if a blogger has the resources to support video, audio or better QoS, he has a right to purchase those tools. That he can is neither unfair nor unconstitutional to the blogger who can't or won't.

Part 3

Unintended Consequences

A. Network Congestion and Censorship

Network neutrality would turn the Internet into a massive "commons." A prohibition on applications quality, prioritization and optimization eventually means bigger applications will consume greater amounts of available bandwidth without having to bear the consequence of their cost. The larger applications will crowd out the small, and, as is usually the case when government regulation interferes with the natural supply and demand, it results in additional government control in the form of rationing or fixed allocation.

This is more than supposition. Municipal wireless networks with neutrality provisions are already running into congestion problems that have forced them to block some Web sites and applications. Ironic indeed that problems brought on by attempts to enforce network neutrality have led to solutions that run counter to it.

In 2006, Culver City, Calif., blocked access to all peer-to-peer sites on its municipal wireless network—the same action that Comcast was inaccurately accused of doing and decried for. The city also blocked access to legal adult sites.

P2P is an Internet-based application that allows users to exchange files directly from their PCs. It is one of the most democratic aspects of the Internet. It has not come without controversy. For example, P2P can be used to copy and exchange copyrighted materials, such as music and movies. But although P2P can result in copyright violation, the application itself is not illegal, nor are P2P sites such as LimeWire, BitTorrent, Napster, Gnutella and KaZaA. P2P also is an inherent part of multiplayer gaming, a major revenue-driver for broadband adoption.

There's a lot at work behind Culver City's decision to block P2P sites, including worries the movie studios, three of which are based in Culver City, have about P2P as a potential competitor. Indeed, the studio influence provides Culver City with a degree of cover as it lets muni proponents and network neutrality advocates off the censorship hook with a "that's politics" shrug.

The question remains as to whether the P2P censorship will extend to other municipal networks that have codified neutrality. There's every reason to believe it will. In 2007, the municipal wireless network in Adel, Georgia, plagued by congestion and using the same technology as Culver City, has since begun P2P blocking.

The magnitude of the problem P2P has already unleashed on commercial networks can be found in a number of industry white papers. Many new companies are poised to provide services that would manage these P2P problems, but network neutrality would preclude them from implementation.

Here's an excerpt from the introduction to a paper by P-Cube, a Cisco Systems subsidiary that sells a bandwidth management platform that lets ISPs classify applications, guarantee service performance and charge for multiple IP services without costly infrastructure upgrades, a practice that would likely be illegal under network neutrality.

> *Due to the unique and aggressive usage of network resources by Peer-to-Peer technologies, network usage patterns are changing and provisioned capacity is no longer sufficient. Extensive use of Peer-to-Peer file exchange causes network congestion and performance deterioration, and ultimately leads to customer dissatisfaction and churn.*[22]

Culver City and Adel are trying to mask a quality problem brought on in part by a network neutrality policy that forces them to censor the Internet, then justify that censorship by demonizing P2P. Bandwidth congestion caused by a neutrality policy has rendered their networks all but unusable. To allow its decision to sit well with the public, it is choosing an easy target. But, at the end of the day, to preserve network neutrality, government officials in Culver City and Adel are making a subjective decision over what is or isn't "legitimate content," something that should concern anyone who values an open Internet.

The question is what happens when P2P begins to swallow up capacity on broadband networks. Internet service providers, whether they are commercial or municipal, have two choices: manage it with traffic partitioning and prioritization, or filter it. Those who value Internet freedom would prefer the first option. Trouble is, a network neutrality law would prohibit both.

B. Higher Prices

There is no question that Internet applications continue to evolve to use greater amounts of bandwidth. The preceding section discussed the effect of peer-to-peer networking alone.

Video services also stand to call on greater amounts of bandwidth and, since they are extremely time and error-sensitive, greater management requirements. Internet movie downloads are no longer the province of the hobbyist. Netflix is the latest company to offer movies over the Internet as part of a subscription package. The Starz cable network operates Vongo.com. Numerous media sites offer recent TV episodes for download. Microsoft's Vista software and Xbox Live further blur the distinction by allowing Web content to be displayed on a large-screen TV.

All these services are welcome, but who should pay the network management costs that are incurred to ensure quality delivery? Service providers say they should be able to charge content and applications providers a fee commensurate with the QoS and optimization their services need. After all, argue the service providers, these third parties are earning considerable revenues on these products. Network neutrality, however, would prohibit service providers from charging applications providers for services that require extra care. That means the cost of managing high bandwidth services needs to be spread over the end-users—meaning higher prices for everybody.

C. Slower Investment

An environment where QoS is regulated or prohibited will have a detrimental effect on investment. Network neutrality is akin to a "regulatory taking" in that it prohibits the owners of "last-mile" networks from realizing the full value of their property. Unlike narrowband networks, carriers can employ QoS techniques in their broadband networks. Network neutrality prohibits service providers from using these techniques to create a separate revenue stream. From the start, return on investment (ROI) is diminished.

Without prospect of ROI, service providers will have no incentive to build in anything above the minimum in terms of network management and optimization. Last-mile networks will become a new kind of bottleneck—choking the evolution of content and applications that would require sophisticated and specialized management within the network. With network neutrality, those applications may never come to be, or else they stand to be delayed by years while vendors engineer workarounds that involve only edge devices.

Moreover, the infrastructure for IP network management and optimization does not generate spontaneously within carrier networks. For all the concern network neutrality proponents have for small and growing businesses, there is a tremendous amount investment and activity by U.S.-based companies—from Fortune 100 giants to entrepreneurial start-ups—looking to provide the equipment that carriers will need to optimize transmission of high-bandwidth applications. These companies include:

Company	Location	Employees	Annual Sales
ADC Communications	Minneapolis, MN	8,600	$1.3 billion
Agilent Technologies	Santa Clara, CA	19,000	$4.8 billion
Anda Networks	Sunnyvale, CA	148	$9.8 million
Ciena	Linthecum, MD	1,485	$780 million
Corning	Corning, NY	25,000	$5.2 billion
Hatteras Networks	Durham, NC	55	$3.6 million
Motorola	Schaumburg, IL	66,000	$42.9 billion
Redback Networks*	San Jose, CA	1,100	$270 million (est. 2006)
Symmetricom	San Jose, CA	951	$208 million

* Acquired by Ericsson in 2007

These vendors were part of a group of 100 manufacturers of network infrastructure who wrote Senate leaders in 2006 urging them not to adopt mandated network neutrality.

D. Less User-Friendly Packaging

Proponents of regulation fear that without network neutrality, service providers would be able to pick and choose "winners" and "losers" through contracts and partnerships that provide preferential treatment. For example, Verizon might be able to sign a deal that gives priority to content provided by *The New York Times.* The *Times* may get a button on a Verizon's default Internet home page, and delivery of *Times* content might be accelerated. In such a set-up, The *Washington Post*, as well as other local newspapers, would indeed be at a competitive disadvantage.

But despite the disadvantage, such arrangements fall short of the "customer harm" test. Indeed, the customer may welcome ready and easy access to certain content providers. Such access may serve as a competitive differentiator. In addition, the Internet "slow lane" is still quite fast. Cable modems move data at up to 15 Mb/s. Even if "best effort" remains the default choice for most Web site owners, there's still every reason to expect their sites will continue to perform on user PCs as well as they do today.

Network neutrality proponents take an extremely relativistic view, assuming that because higher level of Web performance is being guaranteed to a subset of companies, somehow that means performance for everyone else is diminished. This argument is specious. It is akin to asserting that when Toyota unveiled its Lexus luxury car division, it rendered its line of Camrys universally unappealing. To be sure, Lexus cars come with a lot of fancy and comfortable add-ons that enhance the driving experience, but it is not as if Toyota took the tires and headlights off its economy models.

When it comes to the Internet, as with automobiles, there remains a baseline expectation of a robust product. At the same time, consumers acknowledge that product performance nonetheless can be improved for those who choose to pay a premium. Considering that today's standard Internet connection can handle phone calls, videoconferencing, sizable video files and interactive gaming, it's difficult to assert that the introduction of premium quality tiers, or preferential treatment for selected content partners, will take something away from average Web sites. On the contrary, it is just as likely that if bandwidth-chomping applications are partitioned away, data flow from routine sites using low bandwidth, best-effort mechanisms will be less impeded.

It is also critical to remember there are also two aspects to the Web—information and commerce. Net neutrality proponents muddle them when they assert that without network neutrality, those Internet voices with limited means will be drowned out.

The argument again is specious. A Web site operator of limited means will not be able to afford the level of applications—video streaming, hundreds of networked servers and huge data files—that would require the premium optimization services that service providers want to sell.

The Internet indeed offers access to all sorts of ideas and points of view, and no one in the debate is saying these should be stifled. But the Internet connection is also a distribution channel. Companies are using the network facilities, owned by others, to deliver a product and make a profit. And since bandwidth is still a limited commodity, it is within the rights of the owner to set higher prices for commercial users.

In addition, wireless carriers have made such exclusive packaging a regular business practice. AT&T users enjoy ready access to ESPN. Verizon Wireless users get exclusive NFL video clips from its VCast service. Once again, we have an example where the Internet today is not neutral. All of these content providers are getting preferential treatment. Yet no one is claiming customer harm.

Others accuse carriers of "double dipping" when looking to collect additional revenues from applications providers. But dual revenue streams are not that unusual. Newspapers and magazines collect revenues from readers and advertisers. Supermarkets charge shoppers at the checkout, and wholesalers for premium eye-level shelf space. Airport authorities collect user fees from taxes on airline tickets and from airlines for gates closer to the terminal.

E. Legal and Regulatory Challenges

The concept of "regulatory takings" has of late become a part of the larger legal issue of eminent domain law. The 2005 Supreme Court decision in *Kelo v. New London* renewed the debate on the government's right to take private property for public use. That debate has extended into laws and ordinances that restrict a property owner's ability to realize full value of a real estate investment. Such laws may restrict additional construction on parts of the property, or prohibit certain recreational uses. Some constitutional scholars say property owners have a right to challenge these laws under eminent domain because, while they do not take the property outright, they have the effect of substantially reducing the economic potential of their property that existed prior to passage.

In this regard, network neutrality is a form of regulatory taking. As we have seen, broadband networks have the capability to handle QoS and data optimization. We also have noted in the Akamai example that a market exists for these transmission optimization services. That carriers can offer these services—and willing buyers exist—means there is inherent economic value for their infrastructure investment beyond connectivity service to consumers.

Network neutrality prohibitions would reduce the value of their network assets. Although network neutrality pertains to fiber, routers and switches, it is not much different from an ordinance that

allows a local government to prohibit installation of a deck or swimming pool by the declaring one's backyard a "protected wetland." In cases such as *Lucas v. South Carolina Coastal Council* (1992), *Nollan v. California Coastal Commission* (1987) and *Dolan v. City of Tigard* (1994), the Supreme Court has demonstrated a willingness to hear arguments on regulatory takings and set limits to them.[23]

It is not unreasonable to expect that any network neutrality law also would soon find itself undergoing a court test as a violation of property rights. In terms of telecom regulation, jurisprudence already exists in the Supreme Court's ruling in *National Cable Television Association v. Brand X Internet Services*, as well as three appellate court rulings regarding the FCC's regulation on the so-called Unbundled Network Elements-Platform (UNE-P).

In these cases, the courts ruled that regulations that required service providers to share privately-owned facilities at regulated wholesale prices were an unconstitutional violation of property rights. Although those decisions pertained to physical line sharing, not the internal software-based mechanics of IP transmission, the basic premise undergirding the decision is the same—owners of network infrastructure have the right to monetize their private property to the extent the market permits.

The most ironic legal consequence may be the creation of a number of new regulations to deal with the legal morass network neutrality will create. The compromise that preceded the FCC's approval of the AT&T-BellSouth merger is fraught with loopholes. For one, it is valid for only two years. Second, it exempts video.

Another loophole exists as proposed in Section 12(c) of the Snowe-Dorgan bill:

> *Exception—Nothing in this section shall apply to any service regulated under Title VI, regardless of the physical transmission facilities used to provide or transmit such service.*[24]

Title VI of the Telecommunications Act pertains to cable TV services. The 12(c) clause ostensibly would exempt from the net neutrality mandate any service that Congress, the FCC or the courts classify as cable TV. At one time, cable TV service was fairly easy to define. Cable TV signals were transmitted via satellite to a cable company "head-end" within the local community. The head-end aggregates some 200 TV channels on a cable line and transmitted them to homes.

It's not so easy anymore when the Internet is being used to deliver broadcast-quality video. At the same time, new "cable" technology being deployed by companies such as AT&T, relies on the very same Internet Protocol for transmission. Under the Snowe-Dorgan bill, at least at first blush, Netflix would be unable to purchase or use network transmission optimization services to accelerate or guarantee the quality of its Internet video downloads, while AT&T, as a nominal cable service provider under Title VI, would. Another irony, because network neutrality proponents say the intent is to prevent companies like AT&T from leveraging any perceived advantage of their network ownership!

A natural recourse, then, would be for third-party video service providers like Netflix to go to court to get their movie downloads classified as cable TV service under Title VI. One can imagine the legal can of worms this could open as applications providers, prevented from buying and selling optimization services on the open market, look to lawyers, judges and regulators to make nominal distinctions between and among Internet services that pretty much appear the same to consumers.

It's not far-fetched. Because network neutrality regulation, in the end, will repress demand for a legitimate service, Ray Gifford, former chairman of the Colorado Public Utilities Commission predicts an onslaught of legal and legislative gymnastics to undo the problems network neutrality will create.

> *First, a purely taxonomical distinction between public and private networks will be made. Part of a broadband pipe will be treated as "public" and regulated as such, while another part (for instance, the part carrying video programming) will be treated as private and not subject to the panoply of "public Internet" net neutrality mandates. While there will be no principled line that can be drawn to make this distinction, it will be necessary to avoid the more draconian effects of net neutrality.*
>
> *Gradually but inexorably, everyone with specialized needs for quality of service (QoS), low latency or the like, will be purchasing a "private" network capacity that is not subject to the public Internet net neutrality rules. Microsoft and Sony, for instance, might buy or subsidize "private" broadband capacity so gamers on their network will get the low-latency service they need for interactive gaming. Net neutralists will scream at this legerdemain, but will be powerless to stop it because, at some point, even the courts and regulators will have to recognize the validity of private contracts for private service. Besides, regulators will eventually come to understand the negative investment effects of enforced network neutrality, and the needs for low latency and high QoS and this will drive them to allow such arrangements.*[25]

Gifford even cites a precedent. Late in the monopoly era, regulators created the "private line" category so businesses' communications needs could be customized and met without the onerous regulation and cross-subsidization inherent in the public switched network.

> *In truth, of course, a private line looked no different than a public line—the same copper strand could carry both. Yet without these private, relatively unregulated arrangements, large enterprises would bolt the network, and by doing so, leave all consumers worse off. So—* voila!*—all of a sudden "private line" service showed up absent the traditional regulatory burdens.*

In the end, we risk creation of a huge, costly and largely arbitrary legal and regulatory regime devoted to discerning what services should or should not be subject to neutrality laws, all because of a fallacy over the way the Internet works.

Internet transmission is not neutral. Web applications are not neutral. Today, Internet applications providers invest in many tools in an endeavor improve the quality, reliability and competitiveness of their services. Companies that provide Internet transport have much to offer. To ban their participation in this process hurts all businesses and consumers who have come to rely on the Internet for their day-to-day commerce, social connections, education and entertainment. It is sheer folly.

Part 4

Summary and Conclusions

In a mistaken belief that they are preserving a democratic Internet, network neutrality proponents are asking Congress to force the industry to return to a best-effort transmission platform that was the rule only in the Internet's earliest days. The neutrality concept derived from the architectural nature of 20th-century narrowband networks, but was never considered doctrine by engineers who laid the foundation for today's Internet and World Wide Web. An act of Congress declaring the Internet neutral will not make it so.

Such a policy would be nothing short of disastrous for broadband development precisely because it flies in the face of Internet evolution to date. Network neutrality was a necessary condition at the Internet's birth. Since then, all players have been working toward creating a better, more functional and intuitive online experience—sometimes through cooperation, other times through competition. From the very beginning users and Web hosts sought to use network technology at the "edge" and in the "core" to gain an advantage in terms of speed, reliability and quality.

What existed in the past was not network neutrality for the Internet, but network neutrality for phone calls. Calls were point to point, between two-parties. The Internet changed that by allowing third parties to add value. That created a new business model. By limiting service providers to a role as providers of dumb pipes, lawmakers would fail to recognize the ability of networks to add value to content and applications and participate in the further innovation of broadband applications.

The American system of free enterprise generally respects private property and the freedom to invest, and to realize a return on investment through voluntary transactions that yield value to both parties. The fact that companies like Akamai Technologies have built profitable operations by offering network optimization through server networks that work within the Internet shows that applications companies seek these voluntary transactions and derive value from them.

Finally, network neutrality is predicated on fears that service providers are in a position to monopolize the industry, to the point where the latest neutrality legislation calls for judicial remedies. Enlightened policy will accept that service providers are not in the same position they were in years past. Although a consolidated segment, when viewed alongside the titans Google, Yahoo, Sony and Microsoft, service providers are part of a larger information supply chain in

which there exists a balance of market power between content providers and network service providers. Neither group is in a position to exploit the other, or the consumer. A policy that allows the law of supply and demand to develop for bandwidth optimization is the best way of preserving the Internet, driving down costs, and delivering the promised benefits of a robust Internet to consumers everywhere.

About the Author

Steven Titch is a policy analyst at Reason Foundation, focusing on telecommunications, information technology, and municipal broadband issues. He is also managing editor of *InfoTech & Telecom News* (*IT&T News*) published by the Heartland Institute and provides strategic market research and analysis as a private consultant. His columns have appeared in *Investor's Business Daily*, *Total Telecom*, and *America's Network*, among others.

Previously, Mr. Titch was director of editorial projects for *Data Communications* magazine, where he directed content development for supplemental publications and special projects. He also has held the positions of editorial director of *Telephony*, editor of *Global Telephony* magazine, Midwest bureau chief of *Communications Week*, associate editor-communications at *Electronic News*, and founding editor of *Cellular Business* (now *Wireless Review*).

Titch graduated cum laude from Syracuse University with a dual degree in journalism and English.

Related Reason Studies

iProvo Revisited: Another Year and Still Struggling, Policy Brief 69, April 2008.

Better Prices and Better Services for More People: Assessing the Outcomes of Video Franchise Reform, January 2007.

Spinning Its Wheels: An Analysis of Lessons Learned from iProvo's First 18 Months of Municipal Broadband, November 2006, http://www.reason.org/ps353.pdf

The Municipal Broadband Compact, September 2005, http://www.reason.org/wifibroadband/municipalbroadbandcompact.shtml

Questions Public Officials Should Ask About Government Broadband Services September 2005, http://www.reason.org/wifibroadband/broadbandquestions.shtml

David Colton, *Spectrum Privatization: Removing the Barriers to Telecommunications Competition***,** Reason Foundation Policy Study No. 208, July 1996, http://www.reason.org/ps208.html

Milton Mueller, *On the Frontier of Deregulation: New Zealand Telecommunications & the Problem of Interconnecting Competing Networks***,** Reason Foundation Policy Study No. 177, May 1994, http://www.reason.org/ps177.html

Endnotes

[1] Federal Communications Commission, "Consent Decree in the Matter of Madison River Communications LLC and Affiliated Companies," DA-05-543, p.2.

[2] Peter Svensson, "Comcast Blocks Some Internet Traffic," *Associated Press*, Oct. 19, 2007, Available at http://www.breitbart.com/article.php?id=D8SCEBLG0&show_article=1.

[3] George Ou, "A Rational Debate on Comcast Network Management," *ZDNet*, Nov. 6, 2007, available at http://blogs.zdnet.com/Ou/?p=852.

[4] "Internet Freedom Preservation Act of 2008," Reps. Ed Markey and Chip Pickering co-sponsors, 110th Congress, Second Session, p. 3.

[5] The fifth commissioner, Robert McDowell, a Republican, recused himself because of past lobbyist work with a telecom industry trade group.

[6] Timothy Lee, "AT&T Agrees to Neutrality Regulations (Temporarily)," *The Technology Liberation Front*, Dec. 31, 2006; available at http://www.techliberation.com/archives/041588.php#more.

[7] William E. Kennard, "Spreading the Broadband Revolution," *The New York Times*, Oct. 26, 2006, p. A13.

[8] Alfred E. Kahn, "A Democratic Voice of Caution on Network Neutrality," The Progress & Freedom, Foundation, Policy Snapshot Release 2.24, October 2006, pp. 2-3; available at http://www.heartland.org/pdf/20146.pdf.

[9] http://www.satellite-tv-hq.com/telecom-glossary-c.htm.

[10] Art Brodsky, "Here's the FCC Playbook for Burying Network Neutrality," tpmcafe.com, Oct. 5, 2006. Available at http://www.tpmcafe.com/blog/specialguests/2006/oct/05/heres_the_fccs_playbook_for_burying_net_neutrality.

[11] Ben Scott, Mark Cooper, Jeannine Kenney, *Why Consumers Demand Internet Freedom: Network Neutrality: Fact vs. Fiction*, Free Press, Consumers Union, Consumer Federation of America, May 2006, p. 11.

[12] *Patricia O'Connell, ed., "At SBC, It's All About 'Scale and Scope,'"Business Week, Nov. 7, 2005, available at http://www.businessweek.com/@@n34h*IUQu7KtOwgA/magazine/content/05_45/b3958092.htm*

[13] Arshad Mohammed, "Verizon Executive Call for End to Google 'Free Lunch,'" *The Washington Post*, Feb. 7, 2006, p. D1; available at http://www.washingtonpost.com/wp-dyn/content/article/2006/02/06/AR2006020601624.html.

[14] John Markoff and Saul Hansell, "Hiding in Plain Sight, Google Seeks More Power," *The New York Times*, June 14, 2006.

[15] Ibid.

[16] Alan Davidson, "Vint Cerf Speaks Out on Network Neutrality," Google Washington Policy Office, Nov. 8, 2005; available at http://googleblog.blogspot.com/2005/11/vint-cerf-speaks-out-on-net-neutrality.html.

[17] www.akamai.com.

[18] "Akamai Technologies Press Release, "Akamai Content Distribution Infrastructure Adopted in Playstation Network," Dec. 19, 2006; available at http://www.akamai.com/html/about/press/releases/2006/press_121906a.html.

[19] http://www.hoovers.com/akamai/--ID__59556--/free-co-factsheet.xhtml.

[20] Kevin J. Delaney, Mylene Mangalindan and Robert A. Guth, "New Tech Alliances Signal More Scrambling Ahead," *The Wall Street Journal*, May 26, 2006; available at http://online.wsj.com/article/SB114855928978662961.html?mod=technology_main_whats_news.

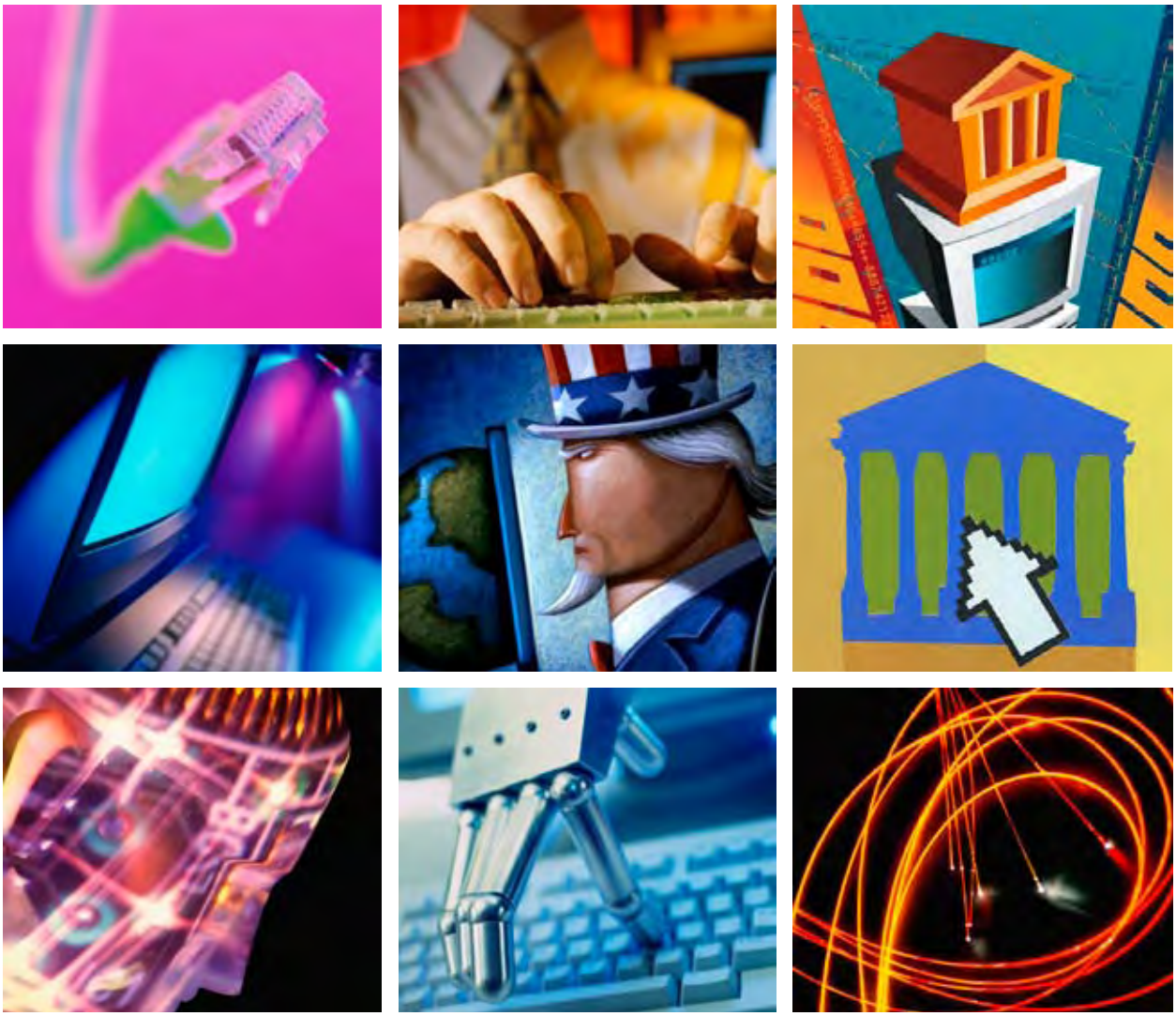
[21] This is not to say Wal-Mart Watch is hard up for resources. Its $5 million annual budget, small for a national non-profit, is enough to support a substantial Web presence. See "The Wal-Mart Posse," *The Wall Street Journal*, Oct. 18, 2006, p. A20. Available at http://online.wsj.com/article/SB116113323291895978.html?mod=opinion_main_review_and_outlooks.

[22] P-Cube Inc., "Controlling Peer-to-Peer Bandwidth Consumption," available at http://www.p-cube.com/doc_root/products/Engage/WP_Controlling_P2P_Bandwidth_Use_31403.pdf

[23] Leonard C. Gilroy, *Statewide Regulatory Takings Reform: Exporting Oregon's Measure 37 to Other States* (Los Angeles: Reason Foundation, April 2006) p. 5.

[24] "A Bill to Amend the Communications Act of 1934 to Ensure Network Neutrality," page 9.

[25] Ray Gifford, "The Natural End of Network Neutrality: The Lawyers Win," *IT&T News*, The Heartland Institute, July 2006, p. 12.



Reason Foundation
3415 S. Sepulveda Blvd., Suite 400
Los Angeles, CA 90034
310/391-2245
310/391-4395 (fax)
www.reason.org