NET NEUTRALITY:

INVESTMENT AND ECONOMICS

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EXECUTIVE SUMMARY

Though the debate around network neutrality is heated and contentious, all sides agree that the abstract quality of "openness" is the defining characteristic of the Internet, and is why the Internet has risen from its original status as an obscure technology to become an essential infrastructure in a matter of years, not decades. Where the sides diverge is how to preserve this abstract quality of openness. Here, we believe the path is clear, and traces its way through decades of regulatory history -- history that teaches us a very important lesson: two-way communications networks are so critical to the basic functioning of our society that they must be operated in a non-discriminatory fashion, one that preserves open and efficient interconnection. Indeed, this lesson is at the heart of the Communications Act, and to deviate from it is to invite a peril that is so great and so costly, that it is nearly unfathomable.

Network Neutrality embodies the basic principle of open nondiscriminatory interconnection that the Communications Act seeks to promote. Thus, Network Neutrality unquestionably should be the cornerstone of America's broadband policy. Network Neutrality makes it possible to have an open market for speech and commerce on the Internet, and it is the FCC's fundamental duty to protect this openness for consumers, citizens and businesses alike. Ultimately, the FCC has the responsibility to ensure that the content market that sits adjacent to the access market retains maximum competitiveness, as it always has, by precluding market power in network ownership from distorting the market for Internet content. This is the successful legacy of the Computer Inquiries that the FCC must uphold.

This economic space at the "edge" of the network architecture has been a remarkable engine of economic growth in the last decade. In addition, this is the space where network technologies meet democratic discourse and open cultural expression. Because of the open marketplace at the edge of the network, an open sphere for public speech has developed that rivals the printing press as the most important development in modern political communication. Policies aimed at the application layer should recognize its centrality to the economic and democratic health of the nation.

Simply stated, there is a reason millions of citizens have told Congress to preserve Net Neutrality.

The importance of the Internet ecosystem exceeds the sum of its parts; its basic DNA of openness must not be destroyed in the shortsighted pursuit of monopoly profits on the part of the private companies who have made billions by selling access to this common good resource.

In this paper we offer evidence that these rules will promote efficient investment, promote innovation, create jobs, and promote competition. We also offer evidence rebutting the major claims of hypothetical harms that openness policy might cause. We then provide extensive discussion on exactly how the FCC should structure these rules in order to effectively preserve and promote the open Internet.

We demonstrate how Network Neutrality will not deter ISP investment, and will promote edge economy Investment. This in turn will feed the virtuous cycle where ISPs will continue to Invest in network infrastructure as the Internet economy grows.

ISPs major stated opposition to Network Neutrality is that without the right to earn new discriminatory-based revenues they will not invest in their networks. However, we explore the likely shape of these hypothetical business models, and find that the true motive beneath ISPs desire to

discriminate is not the possibility of earning new third-party revenues, but the protection of legacy voice and video services from the disruptive competition enabled by the open Internet.

There are three types of discriminatory-based business models:

"Pay-for-Play" -- This model would have ISPs refusing to carry certain traffic unless the content originator pays additional fees above normal transit costs. We find that ISPs are unlikely to pursue this model due to the high likelihood that premium content providers would then emulate the Cable TV model, and refuse to let the ISP carry the content unless the ISP pays the content provider for the privilege of offering this content to its customers.

"Pay-for-Priority" -- Under this scheme, third-party content and applications providers would compensate ISPs for prioritizing their traffic over all other traffic flowing across the ISP's network. But this model is faced with an immovable barrier: the routing of Internet packets is a zero-sum-game; during times of congestion, prioritizing one packet deprioritizes all others. This practical reality firmly bounds the possibilities of the pay-for-priority business model. In practice, this means that in order for this model to work, congestion will have to be widespread. It also means that ISPs will only be able to form a small number of paid-priority business relationships. This in turn means that ISPs will likely form exclusive paid-priority relationships, resulting in the Balkanization of the Internet. This, along with competition from CDN services also means that the total potential revenues that can be earned from the "Pay-for-Priority" model will be relatively low. Therefore, because this model only works when congestion is commonplace, and because its revenue potential is limited, the notion that it will prove superior to the status quo at stimulating ISP investment is highly dubious.

"Vertical Prioritization" -- This model is one where an ISP simply prioritizes its own vertical content and services over all other content. This prioritization can be achieved either by flagging their traffic for priority, or by more subtle ways, such as de-prioritizing applications that are used to deliver classes of content that compete with the ISPs vertical content; or by the outright blocking of an IP application that competes with the ISPs own adjacent market services. Unlike the pay-for-play or pay-for-priority models, this business model involves no new income streams, only the insulation of old streams from network-facilitated competition. But allowing ISPs to insulate their legacy vertical voice and video industries from the natural forces of competition is no recipe for investment -- with reduced competition comes reduced investment incentives.

Therefore, abandoning network neutrality would enable ISPs to reduce investment in the core market, and leverage power into the edge markets, further reducing investment there as well. Abandoning Network Neutrality is certain to stifle growth in the U.S. information economy at a time when this sector serves as our best hope for a productive future.

Historical financial data strongly suggest that network neutrality rules will not deter ISP investment. At the end of 2006, AT&T, as a condition of its acquisition of BellSouth, was required by the FCC to operate a neutral network for two years. During this period, while operating under network neutrality rules, AT&T's overall gross investment increased by $1.8 billion -- more than any other ISP's in America.

Without Network Neutrality, ISPs will have a strong incentive to reduce investment and make congestion commonplace in order to extract revenues from content providers willing to pay to avoid traffic delays.

Without open Internet rules, ISPs will be granted license to abuse their positions as terminating access monopolies, which is in direct conflict with the Act's goals for nondiscriminatory

interconnection. This abuse will lead to even more complicated regulatory issues than are currently faced by the FCC in the Intercarrier Compensation (ICC) debate.

Economic theory and market experience indicate that nondiscriminatory rules are necessary even in access markets with robust competition. It is in recognition of this basic fact that Congress structured the Communications Act such that the FCC was granted the authority to forbear from applying much of the regulations in Title-II to wired and wireless telecommunications providers, but was expressly forbidden from removing nondiscriminatory interconnection obligations.

Network Neutrality will have no impact on certain ISPs already pending desires to gouge their customers using Internet overcharging billing schemes. These schemes are not rooted in efficient recovery of costs, but in the desire to earn supracompetitive profits by abusing market power. Certain ISPs may choose to pursue such practices, but they will not do so because the presence or absence of Network Neutrality rules.

We also demonstrate how Network Neutrality will not harm ISP employment. ISPs have for years been earning higher revenues and simultaneously slashing jobs. Since 1996, AT&T, Qwest and Verizon have collectively seen a 32 percent increase in revenues while jobs have dropped 25 percent. In short, the ISPs pro-consolidation era pattern of destroying good jobs while reaping higher profits will likely continue with or without the existence of Network Neutrality rules.

And we show how Network Neutrality will not widen the racial/ethnic digital divide, and why allowing ISPs to operate discriminatory networks will not result in a narrowing of this digital divide. These arguments are based in the false arguments that Network Neutrality will deter ISP investment, and the factually inaccurate belief that somehow any additional revenues will be used to lower prices thereby attracting consumers from low-income and marginalized communities. The digital divide is a real problem, but the imposition of Network Neutrality will not do anything to exacerbate it; and in fact, without Net Neutrality the supply of diverse content that will be needed to attract new users will be reduced.

We devote the second half of the paper discussing actual regulatory language to preserve the open Internet. In crafting the open Internet policy framework, the FCC must establish a clear, unambiguous rule against all discrimination. This will be essential to protect consumers and competition from harmful behavior. While paid-prioritization is a particularly harmful form of discrimination, any application bias poses a great threat to the long-term health of the innovation economy. A clear reasonable network management standard must buttress the FCC's nondiscrimination rule. Such a standard will permit good behavior without creating arbitrary loopholes.

Rather than creating a prescriptive list of reasonable network management practices, we recommend a standards-based test of simple factors or criteria to judge reasonableness. Reasonable network management must have a very high standard. Discriminatory practices must meet a high bar of legitimacy and must achieve their remedy in a manner among the least restrictive of consumer choice.

We suggest that any discriminatory network management practice should be held to a two-pronged test. First, does it serve a public interest purpose, and are the means for achieving that purpose valid in geography, time, and proportion.

We also discuss the concept of "managed services," and express deep skepticism that such a category of paid-prioritization on the "non-public" Internet would be positive for consumers,

entrepreneurs, or the public interest. If allowed, such private carriage services should be constrained such that they do not cannibalize or reduce bandwidth expansion in the Internet access service. We recommend that Title-II voice and Title-VI video services provisioned over managed IP networks receive the proper regulatory treatment dictated under those portions of existing law.

We conclude that the issues surrounding Managed Services are not pressing, and clearly there is not enough of an evidentiary basis for the FCC to establish a new regulatory regime for such hypothetical services outside of what already exists (i.e. the Computer Inquiry framework). We recommend the FCC study this issue further.

The paper also addresses the issue of Net Neutrality rules for wireless networks, concluding that the rules should apply in a symmetric manner to all methods of broadband Internet access. To the extent that many mobile broadband networks face demonstrably greater challenges than many fixed networks, the range of options considered proportional in response to these challenges will be greater. Any alternative approach, particularly a categorical permission to block high-bandwidth applications or to block low-bandwidth VoIP or other uses, would permit substantial anti-competitive (and anti-consumer) behavior -- and is simply unnecessary. The FCC should require mobile broadband Internet access service providers to permit attachment of any compatible device to their networks, and should ensure that its rule is not rendered meaningless through inefficient, obstructive processes.

We conclude with a reminder of a basic truth: that nondiscriminatory protections are essential to promoting innovation and investment, as well as facilitating more informed citizenry and greater democratic participation. Adopting these principles into formal Net Neutrality rules will bring certainty to the marketplace and continue the historic growth of the Internet economy.

INTRODUCTION

At the turn of the century, high-speed Internet access service was present in about 2 percent of American homes. Today, that figure stands at nearly 60 percent. No other technology even comes close to competing with this pace of adoption -- not the telephone, television, the automobile, cable TV, cellphone, or even the computer itself.

This technology's meteoric rise illustrates the immense value that it brings to users. This value is made possible, in large part, because the Internet is an open platform for innovation, speech and commerce. The Internet's openness brings with it the potential to eradicate the barriers to entry present in traditional communications markets. Content producers no longer need to negotiate with powerful cable providers, newspaper publishers or broadcasters to get their work out to the masses; the Internet has an unlimited number of "channels." A citizen wishing to express an opinion about a pressing issue no longer needs to write a letter to the editor; they can reach far more readers online. And politicians no longer need to rely on the short-attention-span mainstream media to get out their message; they can use the Internet to speak directly to voters. We are only beginning to see the vast potential of the Internet as a medium for civic engagement.

The Internet's openness is also responsible for fostering unprecedented economic growth. It is conduit for near "perfect competition" -- the Holy Grail model for free-market economics. Barriers to entry are reduced. Buyers are empowered by almost unlimited information and unlimited choice. Sellers are empowered by the ability to cut out middlemen and interact directly with the customer. And innovators and entrepreneurs have a platform for launching new ideas globally. What makes all this so remarkable is that the explosion in communications and economic activity took root and grew out of an infrastructure controlled in important ways by monopolists which had every incentive to use their market power to control and monetize these innovations.

The Internet is a common good that will continue to play a critical role in America's economic and social prosperity. But no one single person, government or corporation owns the Internet. Much of the Internet's early development was carried out using public funds, and much of its private development was and continues to be funded by consumers who participate in markets with little meaningful competition. Private companies like AT&T and Comcast build and deploy infrastructure that provide end-users with access to this common good, and they make substantial profits doing so. But consumers don't hand over money to companies like Comcast because they value the connection itself; they are willing to pay $50 per month for the things that connection enables them to do. It's the applications, services and content that give the connection value. ISPs provide access to the Internet, and when they engage in behavior such as blocking, they alter the fundamental nature of how the Internet is expected to work. This threat is why all four of the FCC's original *Internet Policy Statement* principles contain the phrase "promote the open and interconnected nature of the public Internet."

But the current protections are tenuous. The four principles do not affirmatively preclude discrimination. This omission leaves the door wide open to carriers looking to implement discriminatory practices in the name of reasonable network management. This omission allows carriers to use the myth of looming broadband brownouts and capacity crunches to stifle the use of the very applications that are driving innovation and progress on the Internet. The lack of firm nondiscrimination rules creates market uncertainty and sends a signal to carriers that it might one day be permissible to profit from artificial scarcity.

The Internet was born in an environment where innovation and ingenuity were set free. This environment was made possible because the FCC was proactive in ensuring that owners of critical communications facilities behaved properly and stayed out of the way. Discrimination was not an

option, and that was never a point of controversy. It is frustrating that there is even a debate over Network Neutrality, because neutrality is the very lifeblood of the network; it is what made the Internet into a service that companies like AT&T and Comcast could get rich selling. The only reason the fight over Network Neutrality exists is because the FCC left consumers without the basic protections guaranteed in the Communications Act that have been part of the Internet since its inception.

Below we offer evidence that strong, enforceable Net Neutrality rules will promote efficient investment, promote innovation, create jobs, and promote competition. We also offer evidence rebutting the major claims of hypothetical harms that openness policy might cause. We then provide extensive discussion on exactly how the Commission should structure these rules in order to effectively preserve and promote the open Internet.

PART I: THE TRUE RELATIONSHIP BETWEEN NETWORK NEUTRALITY AND INVESTMENT

Factors That Influence Investment

The high-speed Internet Service Provider (ISP) sector is one of the most capital-intensive sectors in our economy. Building networks requires substantial upfront investments, and decisions regarding these investments are driven primarily by factors that influence the value of the return on investment (ROI). These factors are themselves in turn driven by other considerations -- some interrelated -- making overall investment decision-making a complex process that depends on the specifics of a given market. Unfortunately, in the network neutrality debate, investment decisions have been painted as binary -- some ISPs claim that non-discrimination rules will automatically deter, even decimate investment. But this simplistic view ignores other business realities and flies in the face of historical evidence and common sense.

When weighing the potential impact of open Internet rules on investment (both in the ISP sector and within the "edge" sectors that use the Internet as a production input) the Commission must consider all factors that influence investment decisions. In general, these factors are: expectations about demand, supply costs, competition, interest rates, corporate taxes, and general economic confidence.

If a market is expected to grow, businesses have a strong incentive to invest in capacity to meet increased demand, in order to increase revenues. The overall high-speed Internet market is growing, with the wireless data sector poised for substantial future growth. However, even within the wireline sector, there is considerable potential for growth in "next-generation" high-speed Internet services -- those that can deliver speeds well above 10 megabits per second (Mbps). Companies deploying higher-end service tiers are seeing substantial growth in these faster (and more expensive) offerings.[1]

If the cost to serve a customer declines, the potential return on investment increases, giving a firm the incentive to increase investment. In the ISP sector, overall capital equipment costs and operating costs continue to decline. In particular, for cable operators, the relatively inexpensive cost of DOCSIS 3.0 upgrades, coupled with the strong potential growth for faster services, creates an incentive to invest. For Incumbent Local Exchange Carriers (ILECs), deploying faster fiber-to-the-home (ftth) or short-loop DSL services does require a relatively higher level of upfront investment (compared to

[1] *See e.g.*, Comments of Free Press, *In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, A National Broadband Plan for Our Future*, WC Docket Nos. 09-137, 09-51, pp. 48-51; *See also* John Horrigan, "Home Broadband Adoption 2009," Pew Internet & American Life Project, June 2009, p. 23.

cable's upgrade path), but the potential cost savings from copper retirement, coupled with new revenue streams from Internet-delivered TV, also creates a strong incentive to invest.

In markets where technological change is relatively swift and competition is healthy, firms have a strong incentive to invest in order to keep up with or get ahead of their competitors. The current high-speed ISP market is characterized by swift technological change, but the overall level of competition is sub-optimal. The latter factor means that regulators must be vigilant to ensure that the lack of competition and presence of market power do not spill over from the ISP market into the adjacent content and applications markets. If ISPs are allowed to discriminate against content and applications, it will create incentives for them to profit from artificial scarcity by delaying or avoiding network investments -- and it will reduce investment in the content and applications sector.

Interest rates directly impact the cost of borrowing money, and they also impact the opportunity cost of using profits to finance investment. As interest rates decline, firms view capital investment more favorably.

Firms pay taxes based on their profits. If the corporate tax rate is reduced, or if investment tax-allowances are increased, then firms have a greater incentive to invest. In recent years, the federal government has made changes to tax law, such as accelerated depreciation, which reduce ISPs' overall tax burden.

Business confidence in the overall economy directly impacts investment. Strong GDP growth and constrained inflation usually result in strong overall capital investment. Conversely, an economic downturn, even if it disproportionately impacts certain sectors, can lead to uncertainty about growth and demand and thus deter investment. In the overall communications sector, where services are increasingly viewed as necessities, firms may indeed be "recession-proof," but still limit investment during periods of overall economic turmoil. Investment in the communications sector declined sharply following the 2001 recession, and has marginally declined during the current recession (see below). Some scholars actually believe that one of the consequences of the bursting of the housing bubble will be increased institutional investment in the telecom sector, as investors look for proven smart long-term investments, like fiber optic residential products.[2]

The Business Model For Discrimination is Elusive. ISPs Motivation to Discriminate Are Driven Primarily By Their Desire to Insulate Legacy Voice and Video Business Segments from Disruptive Competition.

Some incumbent ISPs claim network neutrality rules will deter investment.[3] But in order for this to be true, the rules will have to substantially impact an ISP's potential return on investment. Yet no ISP has provided a concrete example of how network neutrality will lower ROI. No ISP has proposed a discriminatory business model, nor explained how much additional net revenues such model would likely generate. We do however explore these potential models below, and find them to be quite elusive. This, along with other ISP behavior indicates their hysterical opposition to preservation of the *de facto* status quo net neutrality regime is caused by concerns about insulating their legacy voice, SMS and video revenues from the forces of competition enabled by the Internet. Such

[2] See Andrew Odlyzko, "Network Neutrality, Search Neutrality, and the Never-Ending Conflict Between Efficiency and Fairness in Markets," January 19, 2009. "One possible outcome of the financial crash might paradoxically be that it will encourage greater investment in telecommunications infrastructure. Even aside from government funding for economic stimulus, the crash might, after main turbulence subsides, lead to more realistic expectations of investment returns, which will make long-term investments in projects such as fiber to the home more attractive."

[3] *See e.g.* any filing from AT&T in this proceeding.

concerns were at the root of the Commission's *Computer Inquiry* regulatory framework, and thus it should come as no surprise that the same anticompetitive behavior underpins the current debate. As the Commission knows well, carriers protecting supra-competitive profits in legacy business segments from the forces of competition is the exact type of classic abuse of market power that on the whole reduces total investment and consumer surplus.

The Commission's analysis must start with a basic question: what is it exactly the ISPs are proposing to do in a non-net neutral world to raise additional revenues? Then the Commission must ask: are these proposals viable, and what is the potential size of new revenues? Finally, after these questions are explored, the Commission must ask what the costs of these proposed discriminatory business models to the broader information economy.

We postulate that there are three basic types of potential discriminatory business models that ISPs could theoretically explore. The first is a "pay-for-play" model, where the ISP refuses to terminate a content provider's traffic unless it pays an additional fee beyond what is already paid during the normal course of peering/transport settlement. The second is a "pay-for-priority" model, where the ISP will offer traffic prioritization for a fee to any content provider who wishes to contract for such treatment -- or to an exclusive subset of content providers who are given the opportunity to pay for such preferential treatment. The third model is the "vertical" model, where the ISP prioritizes all of its own affiliated content over content. We discuss each below.

The "pay-for-play" business models first widely discussed in 2005[4] have been shown to be unrealistic, and even some major network neutrality opponents have dropped this unlikely scenario from their anti-network neutrality talking points.

We deem this model to be unlikely largely because such a strategy risks the financial tables being turned on the ISPs, resulting not in their being compensated for transmitting popular content, but their being forced by the market to pay for the privilege of carrying such content. This is due to the basic economic fact that it is the content itself that actually makes Internet access valuable. Consumers are willing to pay hundreds of dollars each year for Internet service solely so they can access content

[4] In 2005, former SBC CEO Ed Whitacre outlined his company's rationale for wanting to violate network neutrality: "We and the cable companies have made an investment and for a Google or Yahoo! or Vonage or anybody to expect to use these pipes [for] free is nuts!" Similarly, in 2006 John Thorne, a Verizon VP, made a speech in stating that "[t]he network builders are spending a fortune constructing and maintaining the networks that Google intends to ride on with nothing but cheap servers." This belief that content and applications companies get a "free ride" on the Internet is completely wrong, and reflects a serious misunderstanding about what actually gives Internet access services their value. The simple fact is that content companies pay billions of dollars to transmit their content via the Internet; and consumers spend even more for the ability to access that content. In the Internet world, unlike the long-distance telephone market, end users have no direct financial relationship with the party in the middle transporting the "call" -- as there are potentially dozens of network owners in the middle routing the data to its final destination. Content companies like Yahoo pay large sums of money to telecommunications companies to serve their content "up to the Internet." Those telecom companies in turn have financial relationships with other carriers to transport data across the country. So when Verizon receives traffic originating from Yahoo handed off by a long-haul network provider, it receives this data while also giving the long-haul provider data from Verizon customers to carry back out across the Internet. Sometimes this interconnection of traffic is unbalanced and fees are paid, while at other times, the traffic going back and forth is roughly equivalent, and there is no money exchanged. But the point here is that there is a financial structure in place at every point in the network. If Verizon feels it is losing money by receiving traffic on its network, then it should revisit its peering and transport agreements. But it is absurd to think that the content and applications companies merely set up "cheap servers" and call it a day. In other words, ISPs already receive remuneration for traffic traversing its network; what they want to be able to do is use their position as terminating access monopolies to price discriminate (see Section II. A. iv. *infra* for further discussion on this point). *See* "At SBC, It's All About 'Scale and Scope,' " Business Week, Nov. 7, 2005; *See also* Arshad Mohammed, "Verizon Executive Calls for End to Google's Free Lunch," Washington Post, February 7, 2006.

and applications. In other words, consumers don't place value on the connection; they place value in the content delivered by that connection.

Consider the cable and satellite television service market. Do content providers like HBO, AMC, ESPN and Fox News pay cable companies like Comcast for the privilege of delivering their content to Comcast's customers? Not at all. In fact, it is just the opposite -- conduit pays for content: the cable companies pay the content providers for the right to carry their content, because the content is what consumers value, not the conduit. Fortunately, the Internet is not like the cable system, and it gives companies and consumers the ability to establish direct relationships with one another, circumventing the traditional gatekeeper business model found in the cable sector. And this is ultimately what the cable and telecom companies fear -- the inability to monetize and extract monopoly profits off every bit that flows across their networks.

Pay-for-priority, a more subtle form of classic pay-for-play is the hypothetical business model that now occupies much of the network neutrality debate. But just like classic pay-for-play, pay-for-priority suffers from many logical and practical flaws that render the pursuit of such models questionable at best. Under this scheme, third-party content and applications providers would compensate ISPs for prioritizing their traffic over all other traffic flowing across the ISP's network. But unlike paid-prioritization in other markets like parcels,[5] the routing of IP data is a zero-sum game: If a router speeds up one set of bits, by definition, all other bits are slowed down.[6] This practical reality firmly bounds the possibilities of the pay-for-priority business model.

The first practical reality that binds this model is one rooted in concerns of product devaluation: since prioritization is a zero-sum game, the corresponding degradation in non-prioritized content could be substantial enough to devalue the utility of the broadband connection itself. In other words, as an ISP increases the amount of prioritized content, the negative impact on all other content increases. In such a case, because of the negative impact on non-paid priority content, consumers would be less willing to pay for broadband, and an ISP's revenue gains from prioritization arrangements might not be enough to offset the losses stemming from user defection and devaluation.

The second practical reality bounding the pay-for-priority has to do with the potential size of the pay-for-play market -- both in terms of the revenue potential and in terms of the number of paid-priority business relationships. First, unless network owners are blocking certain Web traffic outright (and thus extracting blackmail revenues in the above-discussed pay-for-play model), it isn't clear at all that content providers would be willing to pay for this form of accelerated delivery, when services like local caching (so called "CDNs" or content-delivery networks) are sufficient to deliver low-cost, quality streaming video. If we assume that the practical user-experience difference would be sufficiently superior to local caching, it is not then clear how much *more* a content provider would be willing to pay to achieve this prioritized difference. Today, this entire market for this "geographic prioritization"

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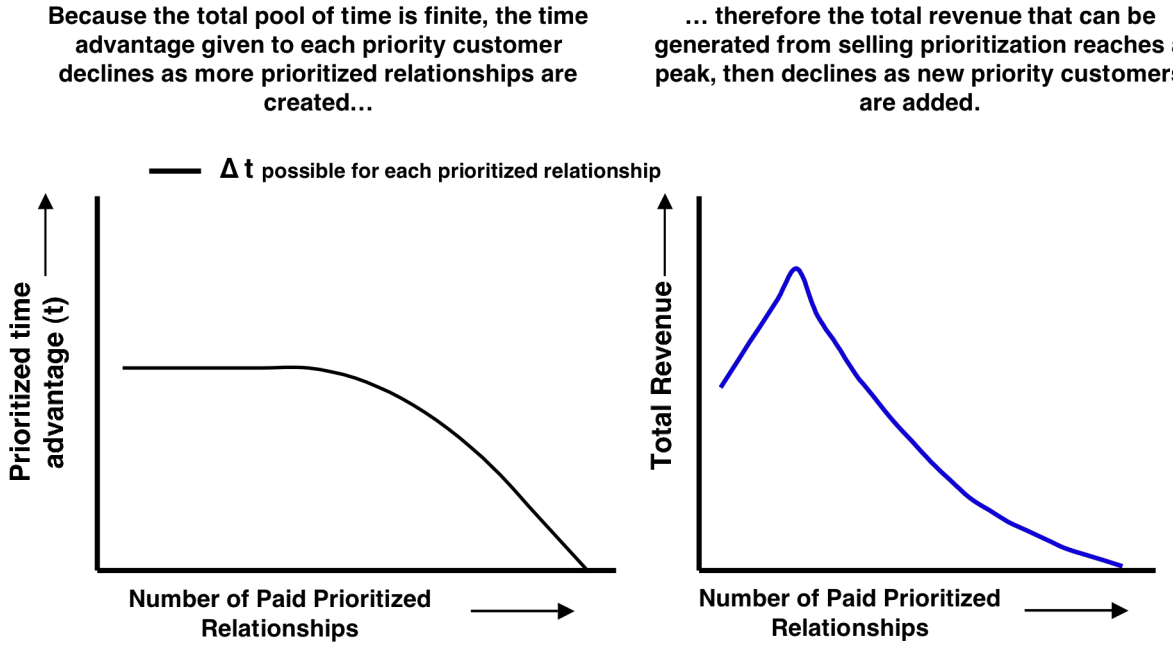
[5] The fact that parcel delivery is not a zero-sum game but packet delivery is has not stopped anti-openness proponents from pushing this incorrect analogy. *See* Comments of the United States Internet Industry Association (USIIA), *In the Matter of Broadband Industry Practices*, WC Docket No. 07-52, p. 6 (June 15, 2007). "Tiered services are a part of nearly every industry, where they serve an important role in both speeding some customers through their desired tasks and permitting the normal flow of commerce in the basic or non-tiered services. The existence of business class does not slow the flight for those who buy airline or train seats in coach. Overnight delivery of letters by UPS or FedEx does not slow the deliveries by the US Postal Service."

[6] *See* M. Chris Riley and Robb Topolski, "The Hidden Harms of Application Bias" (Nov. 2009), *available at* http://www.freepress.net/files/The_Hidden_Harms_of_Application_Bias.pdf ("*Hidden Harms of Application Bias*") at 2, "[W]ith congestion, prioritization forwards higher priority packets ahead of other traffic, and lower priority packets are negatively affected until there are no higher priority packets to send. Prioritization operates by degrading and harming lower priority traffic, because (by definition) more low priority packets are delayed or dropped."

in the U.S. is less than one billion in annual revenues.[7] Though it is quite imprecise to use the CDN as a proxy for the size of the potential paid-prioritization (and is perhaps an overestimate),[8] even if we assumed the entire CDN business shifted to ISP-paid-prioritization, this revenue would represent a tiny drop in the ISP revenue bucket -- on the order of less than one-half of one percent of current revenues.[9] Second, unlike the CDN market where there is no upper limit on the amount of content that can be locally cached, as discussed above, the zero-sum game nature of packet switching does mean that there is an upper limit to the amount of content that can be given priority routing status (see Figure 1).

Figure 1: The Practical Limitations to Paid-Prioritization



As discussed above and represented in Figure 1, because packet-switching is a zero sum game, there is a theoretical upper limit to how many prioritized relationships an ISP can establish. This is because as the number of prioritized relationships grows, the degradation to all non-prioritized content becomes unacceptably high; and because the total pool of time is finite, the time advantage given to each priority customer declines as more prioritized relationships are created. This places an upper bound of the number of paid-priority relationships a given ISP can enter. Thus, if ISPs are allowed to established fee-for-priority relationships with individual firms, they will strike deals with a handful of firms who have the highest willingness to pay for prioritized treatment. In practice, this means both exclusive deals and preferential treatment for vertically integrated content. This will thus

[7] Estimates are notoriously hard to come by. One analyst estimated the U.S. CDN video delivery market took in $400-$500 million in revenues for 2007, and expected that to grow to $800 million in 2008. *See* Dan Rayburn, "Market Size For Video CDN Was $450-$500 Million This Year: Should Grow To $800 Million For 2008," December 11, 2007. Available at http://blog.streamingmedia.com/the_business_of_online_vi/2007/12/market-size-for.html.

[8] Companies who have popular content would have potential leverage with the ISPs, as the ISPs peering with or hosting that content in a local ISP CDN would save the ISP money otherwise spent on transit -- that savings might indeed be more than the amount the content provider is willing to pay for prioritized delivery. In such a case the ISP would be better off offering discounted CDN service rather than prioritized transit from an out-of-network or in-network CDN, or from a regular Point-of-Presence.

[9] For example, AT&T, who serves nearly one-quarter of all high-speed Internet customers, earned $25 billion in wireline data revenues in 2008 alone.

deliver the undesirable consequence of Internet balkanization, where ISPs (who already eschew price competition in favor of product differentiation) will establish exclusive content arrangements as a method of product differentiation -- Comcast's exclusive video partner might be Hulu, while AT&T's might be YouTube. Users trying to use the non-affiliated (and non-prioritized) services will likely find them unacceptable slow, and the market will fragment.

Furthermore, the above analysis and its implications blow a huge hole in the ISP argument that network investments will only take place if they are freed to price discriminate via pay-for-priority. Content providers only have an incentive to pay for ISP-prioritization if it makes a substantial difference in the quality of their product as delivered to the end-user. This incentive only becomes *real when network congestion is the norm*. Under this economic model, a network owner actually has every incentive not to upgrade their network -- for if they did, they would undermine the entire rationale for prioritization. In other words, once an ISP establishes a system of prioritizing certain content in exchange for payment (and thereby degrading for non-payment all other content), the ISP would have every incentive *not* to invest in increased capacity, for fear of reducing congestion and eliminating the very feature that made content providers willing to pony up for prioritized delivery. Thus Net Neutrality actually encourages deployment, because without it, network operators would have substantial incentive to delay upgrades in order to profit from artificial scarcity.

The third prioritization model is one where an ISP simply prioritizes its own vertical content and services over all other content. This prioritization can be achieved either by flagging their traffic for priority, or by more subtle ways, such as de-prioritizing applications that are used to deliver classes of content that compete with the ISPs vertical content[10]; or by the outright blocking of an IP application that competes with the ISPs own adjacent market services.[11] Unlike the pay-for-play or pay-for-priority models, this business model involves no new income streams, only the insulation of old streams from network-facilitated competition. Any business should of course be concerned about competition eroding margins; but the Commission must recognize that these concerns have more to do with reducing competition than they do with investment. The Commission has a statutory duty to promote competition; it also has a statutory duty to ensure interconnection. Allowing ISPs to break the open interconnected nature of the Internet in the name of protecting current ISPs adjacent businesses from competition cannot be a path the Commission follows. If investment is a core Commission goal, then it must recognize the basic fact that with reduced competition comes reduced investment incentives. This is certainly true in the core network market and in the broader edge markets -- abandoning network neutrality would enable ISPs to reduce investment in the core market, and leverage power into the edge markets, further reducing investment there as well.

Fortunately, policymakers do not need to rely solely on theoretical arguments about how network neutrality will impact investment, as we have the results from a natural experiment implementing these rules on the largest ISP in America.

Historical Data Suggests that ISPs' Investment Decisions are Not Negatively Impacted by Network Neutrality

In the final days of 2006, the FCC approved the merger of AT&T and BellSouth only after the company agreed to operate a neutral network (by adhering to the four principles of the FCC's *Internet Policy Statement* as well as a fifth principle of nondiscrimination) for two years following

[10] For example, an ISP could designate BitTorrent as a low-priority application, and delaying it, or disrupting how the application works by blocking users ability to originate such content.

[11] For example, a mobile wireless ISP could bar the use of VoIP applications on its 3G data network in order to guard against cannibalization of mobile voice revenues.

the transaction.[12] A review of AT&T's investments over those two years shows quite clearly that a strict network neutrality rule did not result in the company reducing capital investment.

In 2006 -- prior to agreeing to the five network neutrality principles -- AT&T and all its then-current and future subsidiaries (i.e., the full post-2006 company, which includes SBC, BellSouth, Cingular -- or AT&T Mobility -- and ATTC) made $18.2 billion in gross capital expenditure investments. After two years of operating under a strict network neutrality regime, the company's gross capital expenditures rose to $20.34 billion. In terms of capital expenditures as a percentage of revenues, AT&T's investment increased from 14.9 percent in 2006 to 16.4 percent in 2008 (see Figure 2).

These data represent all of AT&T's business segments; however, the fifth principle of nondiscrimination applied specifically to AT&T's wireline network. But in this segment, the company's investment growth under the network neutrality framework was even stronger than the overall company's growth before the framework was implemented. In 2006, the combined company's wireline capital expenditure was 13.5 percent of wireline revenues. By the end of 2008, this had increased to 20.2 percent (see Figure 2).

Figure 2: AT&T Investment Before and After Network Neutrality

Company	2005			2006			2007			2008		
	Gross CapEx (Billions $)	Revenue (Billions $)	Gross CapEx / Rev	Gross CapEx (Billions $)	Revenue (Billions $)	Gross CapEx / Rev	Gross CapEx (Billions $)	Revenue (Billions $)	Gross CapEx / Rev	Gross CapEx (Billions $)	Revenue (Billions $)	Gross CapEx / Rev
AT&T*	$17.7	$122.7	14.4%	$18.2	$122.5	14.9%	$17.9	$118.9	15.0%	$20.3	$124.0	16.4%
AT&T (wireline only)	$10.2	$88.3	11.6%	$11.8	$87.4	13.5%	$13.8	$71.6	19.2%	$14.1	$69.9	20.2%

*Source: Company annual reports. * Includes data for 2005 from SBC, ATTC, Bell South and Cingular Wireless. For 2006, data are included from SBC, Bell South and Cingular Wireless. This ensures accurate comparability across all years.*

Not only did AT&T's investment increase under network neutrality rules, but the company's gross investment also increased more than any other ISP's in America during this period. In the two years following the imposition of network neutrality rules, AT&T's gross capital expenditures increased by $1.8 billion, or 10.2 percent. In contrast, the other two Regional Bell Operating Companies (RBOCs) had a lower percentage increase in gross capex spending, with Verizon showing a 0.8 percent increase from 2006 to 2008 and Qwest increasing its gross capex by 8.9 percent during this period (see Figure 3).

While gross capital expenditures are an obvious investment metric, these absolute figures can be somewhat misleading depending on the overall size of a business. Hearing that a company spent $100 million on capex certainly sounds impressive, unless you then consider that the company also took in $100 billion in revenue. This is why it is also useful to measure capital investment as a percentage of revenues. Looking at all the major U.S. ISPs' investments during the 2006-2008 period, we see that AT&T under network neutrality rules had higher levels of relative investment growth than

[12] In addition to agreeing to conduct business in a manner that comports with the *Policy Statement*, AT&T/BellSouth agreed "not to provide or to sell to Internet content, application, or service providers, including those affiliated with AT&T/BellSouth, any service that privileges, degrades or prioritizes any packet transmitted over AT&T/BellSouth's wireline broadband Internet access service based on its source, ownership or destination." This commitment ended on December 29, 2008, two years from the merger consummation date (the commitment to the *Policy Statement* continues until May 29, 2008). *See* Letter from Robert W. Quinn, Senior Vice President, Federal Regulatory, AT&T, In the Matter of *AT&T Inc. and BellSouth Corporation Application for Transfer of Control*, WC Docket No. 06-74 (filed Dec. 28, 2006) (*AT&T Dec. 28 Ex Parte Letter*).

many other companies, with relative investment levels by Verizon, Comcast and Time Warner Cable actually declining during this period (see Figure 4).

Figure 3: Major ISP Gross Capital Investment 2006-2008

Company	2006 Gross CapEx (Billions $)	2008 Gross CapEx (Billions $)	Growth in Gross CapEx 2006-2008 (Billions $)	Percent Change in Gross CapEx 2006-2008
AT&T*	18.25	20.34	2.09	10.2%
Comcast	4.70	6.28	1.58	33.5%
Time Warner Cable	2.77	3.52	0.75	27.0%
Qwest	1.63	1.78	0.15	8.9%
Verizon	17.10	17.24	0.14	0.8%
CenturyTel	0.31	0.44	0.12	38.8%
Charter	1.10	1.20	0.10	9.0%
Fairpoint	0.21	0.30	0.08	38.9%
Cincinatti Bell	0.15	0.23	0.08	52.6%
MediaCom	0.21	0.29	0.08	37.9%
RCN	0.09	0.14	0.06	66.2%
Cablevision	0.89	0.92	0.03	3.9%
Frontier	0.27	0.29	0.02	7.2%
Windstream	0.37	0.36	-0.01	-2.4%
Embarq	0.92	0.69	-0.24	-25.7%
Adelphia	0.33	n/a	n/a	n/a
All Major U.S. ISPs	49.31	54.00	5.02	10.2%

*Source: Company annual reports. * Includes data for 2006 from SBC, Bell South and Cingular Wireless. This ensures comparability across years.*

Now, let us be clear -- we are not making a claim of causality about this one single case of the imposition of a strict principle of non-discrimination and its impact on investment. There's simply not enough data and too many other interviewing factors particular to this transaction. It is merely suggestive of what might take place. What we are suggesting is the "net neutrality will destroy investment" rhetoric coming from the ISPs and their proxies is on its face absurd. Having the AT&T experience as a data point is indeed interesting; but it alone is not as convincing as the common sense reasoning as to what the discriminatory business models will likely be. As we showed above, the ISPs are bound by factors beyond their control, and there is plenty of reason to seriously doubt that ISPs will be able to earn new revenues of any significance from third-party paid prioritization.

Figure 4: Major ISP Relative Capital Investment 2006-2008

Company	Sector	2006 Gross CapEx/Rev	2007 Gross CapEx/Rev	2008 Gross CapEx/Rev	Change 2006-2008
Fairpoint	ILEC	17.9%	12.5%	23.3%	5.4%
RCN	Cable Overbuilder	14.7%	18.2%	19.4%	4.7%
Cincinatti Bell	ILEC	11.9%	17.3%	16.5%	4.5%
CenturyTel	ILEC	12.8%	12.3%	16.8%	3.9%
MediaCom	Cable	17.4%	17.6%	20.7%	3.3%
AT&T*	ILEC+Wireless	14.9%	15.0%	16.4%	1.5%
Qwest	ILEC	11.7%	12.1%	13.2%	1.5%
Frontier	ILEC	13.3%	13.8%	12.9%	-0.4%
Comcast	Cable	18.8%	21.2%	18.3%	-0.5%
Windstream	ILEC	12.1%	11.5%	11.3%	-0.8%
Charter	Cable	20.0%	20.7%	18.6%	-1.5%
Verizon	ILEC+Wireless	19.4%	18.8%	17.7%	-1.7%
Cablevision	Cable	15.2%	12.3%	12.8%	-2.5%
Time Warner Cable	Cable	23.6%	21.5%	20.5%	-3.1%
Embarq	ILEC	14.5%	13.0%	11.2%	-3.3%
Adelphia	Cable	12.0%	n/a	n/a	n/a
All Major U.S. ISPs		16.7%	17.0%	16.9%	0.2%

*Source: Company annual reports. * Includes data for 2006 from SBC, Bell South, and Cingular Wireless. This ensures comparability across years.*

The rhetoric about network neutrality discouraging investment is just a general reflection of the common but misguided belief that any and all regulation discourages investment. According to this theory, regulation will perpetuate uncertainty and will reduce potential return on investment, thereby reducing the incentive to invest. But all regulation is not created equal. Some regulation is heavy-handed, designed to control retail prices in a monopoly market, while other regulation can be much lighter, providing basic rules of the road that ensure healthier competition in an otherwise concentrated market.

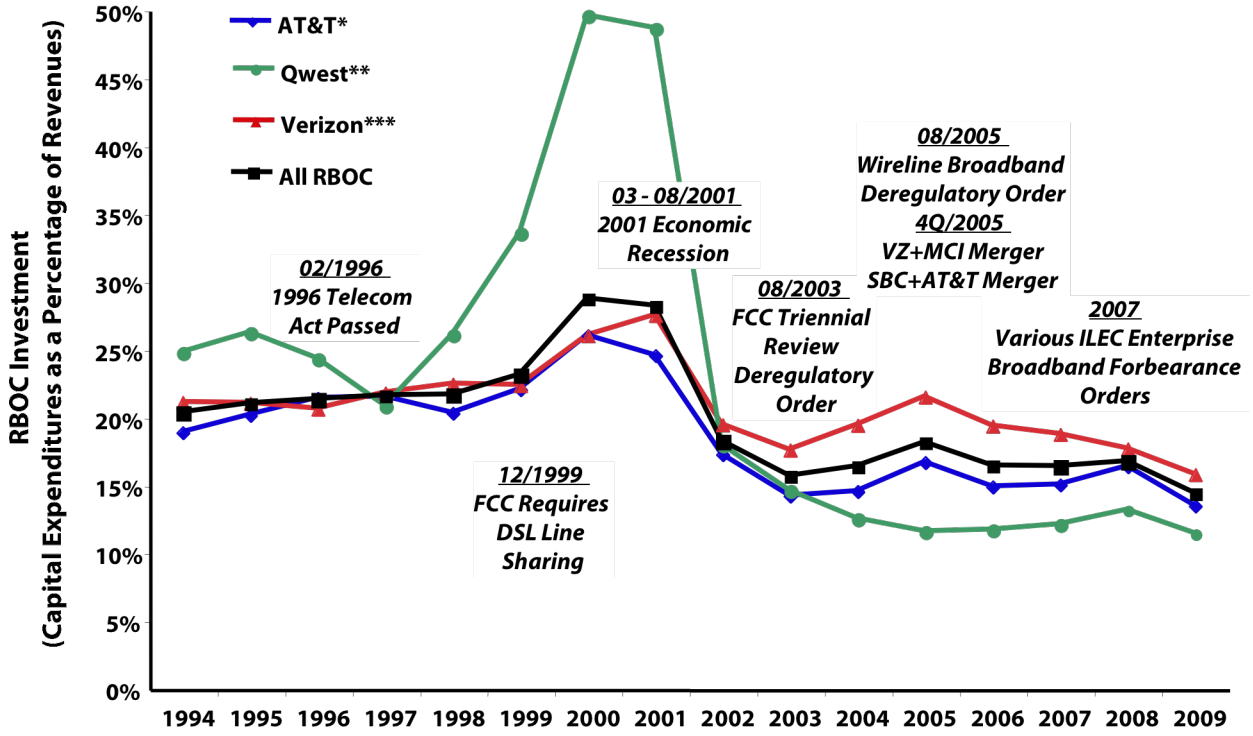
So what should we make of the theory that regulation reduces investment? Evidence from the past 13 years from the Incumbent Local Exchange Carrier sector suggests little support for this theory. In fact, during this period, which saw the imposition of substantial regulation followed by equally substantial deregulation, we see that regulation may have actually encouraged investment -- and that deregulation and consolidation may have decreased investment.

In 1994, two years before the 1996 Telecom Act was passed, the combined gross capital investment of the RBOCs was 20 percent of revenues. Immediately following the passage of the 1996 Act, RBOC investment as a percentage of revenues grew, despite substantial regulations at the wholesale and retail levels. By 2001, RBOC investment as a percentage of revenues reached 28 percent (see Figure 5).

Investment continued to rise throughout the year 2000, despite the bursting of the dot-com bubble in March of that year. In 2001, despite a six-month recession, RBOC investment held steady. It wasn't until 2002, when the FCC began dismantling the 1996 Act's regulations that relative investment declined sharply, to a low of 15.7 percent in 2003. Investment rose slightly in 2004 and 2005, but then declined and held flat following the FCC's subsequent complete deregulation of broadband and approval of a series of massive mergers (see Figure 5).

In short, these data suggest that ISP investment decisions are not driven simply by regulation or the lack thereof. In fact, it appears that regulation, especially if designed to promote competition, can stimulate investment.

Figure 5: RBOC Capital Investment as a Percentage of Revenues 1994-2009



*Source: Company annual reports. * Data for AT&T incorporates all the data from the company's predecessor ILEC RBOCs (Southwestern Bell, SBC, PacTel, SNET, BellSouth and Ameritech, as well as their wireless subsidiaries, which from 2000-2006 were subsumed under the Cingular/AT&T Mobility banner). Data prior to 2006 does not include AT&T Corp (ATTC) information, as this company was a CLEC prior to the merger with SBC. ** Data for Qwest prior to 2000 is for US West, but excludes prior information for Qwest, which operated as a CLEC prior to the 2000 takeover of US West. *** Data for Verizon incorporates all the data from the company's predecessor ILEC RBOCs (Bell Atlantic, NYNEX and GTE, as well as Verizon Wireless). Data prior to 2006 does not include MCI/WorldCom information, as this company was a CLEC prior to the merger with Verizon.*

While no one can say for certain what precise outcome network neutrality will have on ISP sector investment, we should take stock in what is going on behind the scenes in the networking equipment market. The so-called deep-packet inspection (DPI) technology that enabled Comcast to secretly block the BitTorrent application is now being marketed to ISPs as a technology that can be used to avoid investing in new capacity. For example, one DPI vendor states that "by shaping traffic at the subscriber-level [using DPI], bandwidth is made available for new revenue generating services. Rate limiting traffic allows network infrastructure build-out to be deferred, *thereby reducing capital expenditures*."[13]

Without Open Internet Rules, ISPs Will Be Granted License to Abuse Their Positions as Terminating Access Monopolies, Which is In Direct Conflict with the Act's Goals for Nondiscriminatory Interconnection

In the FCC's proposed open Internet framework, it notes that the opponents of Net Neutrality "often claim that charging content, application, and service providers may be necessary to recover the cost of the investment in their network and to fund additional investment in…infrastructure."[14] This

[13] *See* M. Chris Riley and Ben Scott, "Deep Packet Inspection: The End of the Internet as We Know It?" March 2009, at n. 51 (*emphasis added*).

[14] *See Preserving the Open Internet*, GN Docket No. 09-191; Broadband Industry Practices, WC Docket No. 07-52, Notice of Proposed Rulemaking, 24 FCC Rcd. 13064 (2009) at para. 65 ("*NPRM*" or "*Notice*").

argument then concludes, "charging only end users instead would increase end-user prices, limit the number of users, and reduce revenue, discouraging network improvements."[15] This is the ISPs' core argument, and they are free to make it, but the Commission must recognize that it defies reality. Just like consumers, content creators pay a fee, in this case to hosting companies. Indeed, Free Press pays a substantial sum each month to ensure that our website can be accessed quickly by all visitors.[16] This money works its way through the value chain, reaching network providers.[17] Network operators have long been able to price these services at the rates they desire. In short, no one is trying "to use [their] pipes for free."[18] The Commission should recognize the ISPs complaint here is not based on the lack of adequate compensation for exchange of traffic, but on the ISPs desire to abuse their position as a terminating access monopoly by price discriminating against certain streams of traffic based on their source, or by degrading otherwise seamless and efficient interconnection.

This is a crucial point that the Commission must take in to account: it is the stated purpose of the Communications Act "to promote nondiscriminatory accessibility by the broadest number of users and vendors of communications products and services to public telecommunications networks,"[19] and to "to ensure the ability of users and information providers to seamlessly and transparently transmit and receive information between and across telecommunications networks."[20] What ISPs want free reign to do -- be it pay-for-play, pay-for-priority, or vertical-prioritization -- is violate the Act's stated purposes regarding interconnection. Now, incumbents will certainly argue that the Commission's *Cable Modem Order*, *Wireline Broadband Order*, and *Wireless Broadband Order* all mean that they are not subjected to the Act's interconnection provisions. However, it is not at all clear that the information service designation has removed these services from direct enforcement of Title-II interconnection obligations, and even if that is the case, the Commission has very clear justification to subject these services to interconnection policy via ancillary authority.[21] Should ancillary authority prove

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[15] *Id.*

[16] This is due in part to the importance of webpage load times. *See e.g.* Pear Analytics, "How Load Time Relates to Visitor Loss," Aug. 6, 2009.

[17] The largest providers have mutually agreed upon peering arrangements, which benefit both parties. *See e.g.* Rudolph van der Berg, "How the 'Net works: an introduction to peering and transit," *Ars Technica*, Sept. 2, 2008.

[18] *See supra* note 8. Despite SBC (now AT&T) being the initial purveyor of this "free rider" myth, AT&T has noted that in 2006 YouTube "had begun purchasing backbone transit services for 20 Gbps of video traffic" Comments of AT&T, Inc, In the Matter of *Formal Complaint of Free Press & Public Knowledge Against Comcast Corp. for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices; Petition of Free Press et al. for Declaratory Ruling That Degrading an Internet Application Violates the FCC's Internet Policy Statement & Does Not Meet an Exception for "Reasonable Network Management*," WC Docket No. 07-52, p. 7 (Feb. 13, 2008). *See* "At SBC, It's All About 'Scale and Scope,' " Interviews with Chicago Bureau Chief Roger O. Crockett, Business Week, November 7, 2005.

[19] 47 U.S.C. 256(a)(1).

[20] 47 U.S.C. 256(a)(2).

[21] For a detailed examination of this very issue, *see* Kevin Werbach, "Off the Hook," *Cornell Law Review*, forthcoming 2010. "The substantive provisions that apply generally, not just to incumbents, are Section 251 (requiring interconnection), and Section 256 (requiring coordination for interconnectivity). The common theme of open interconnection runs through all of them. Providers of telecommunications services must interconnect, they must do so through open standards, and they must share infrastructure. There is, therefore, a clear Congressional vision to promote open, interconnected networks… Moreover, while these requirements specifically apply to telecommunications carriers, they are not limited in application to telecommunications services. Verizon is still a telecommunications carrier even though it sometimes provides information services. So is Comcast, which is now one of the nation's largest telephone companies. Section 251 mandates interconnection of "facilities and equipment," which in a digital environment can be used to provide many different kinds of services. Section 256 declares a goal to promote unfettered transmission for "users and information providers," which depend on the transport capability embedded in Internet communications services… By limiting the scope of Sections 251 and 256 to telecommunications carriers, Congress limited regulation of pure information services markets, such as instant messaging and social networks. There is nothing to suggest that Congress intended to limit openness of network ecosystems built on telecommunications infrastructure. On the contrary, the Act manifests an express desire to promote those goals." (*internal citations omitted*).

insufficient, the Commission always retains the option of reclassification of these services under Title 2. Clearly, the Commission cannot be left with no legal jurisdiction to enforce core statutory obligations in the Act.

The interconnection issues raise another facet to this problem that the Commission should consider: ending the current system of default network neutrality enables the abuse of terminating access monopoly power in a manner that is far worse than any the Commission has ever faced. One of the thorniest issues the Commission is currently wrestling with is how to set the "right" price for intercarrier compensation (ICC). In this area, the Commission need not even worry about price discrimination -- it has the task of regulating rates for efficiency non-discriminatory interconnection. Yet it still struggles. This struggle exists because of the presence of terminating access monopolies, and is one that is not in any way solved by the presence of multiple competitive service providers -- even carriers without market power are prone to abusing their position as terminating access monopolies.[22]

In the ICC arena, the policy solution most often highlighted as being the most efficient and least regulatory is "Bill-and-Keep."[23] Bill-and-Keep gets around the classic ICC problems by moving the regulatory paradigm away from the "calling party pays" economic principle, to one that recognizes the benefits to both the called and calling parties. And while the telephony industry matured under the calling party pays economic principle, the IP telecommunications market has essentially existed under a *de facto* efficient Bill-and-Keep regime.

Examining last mile IP communications through the lens of Bill-and-Keep is instructive, as it highlights problems ahead if the Commission abandons its duties to preserve open and nondiscriminatory interconnection. The Bill-and-Keep model has two basic components: 1) the calling party pays transit costs to termination point at last handoff and 2) the called party cannot charge a termination fee. In IP communications, the end-user "calls" a server, server answers (this complicates the analogy, b/c the traditional called party is now being treated like the traditional calling party… we'll set this aside, and consider that the server is the calling party). Bill and Keep theory suggests that the most efficient way to allocate network costs is for the calling party (and the called party) to recover costs from end-users. This means essentially the status quo in the ISP industry, where ISPs charge end-users a monthly fee, and they have transit arrangements that range from transport to peering. However, ISPs want to charge the "called party" a termination fee, based on the type of traffic. That fee will likely be zero for some traffic, but those with a willingness to pay for prioritization (assuming blocking is prohibited) the fee would be non-zero. Therefore, a move away from the status quo replaces the efficient Bill-and-Keep system with one that reinstates the inefficiencies associated with terminating access monopolies. With a prohibition on outright blocking, this takes the form of the access monopoly degrading the quality of the "call." The current system is more efficient because the prioritization charge will most certainly not be based on cost, but on the highest willingness to pay for prioritization, which in turn is reflective of the practical quality of the prioritization (which itself is directly related to the amount of congestion, demonstrating again that in order for the pay-for-priority model to work at all, congestion has to be the normal state of affairs).

Under no circumstances is a carrier abusing its terminating access monopoly efficient, and using that monopoly to price discriminate against specific sources of content compounds the problem, especially if the provider faces little effective competition. We strongly believe that the open Internet rules as generally proposed in the *Notice* will serve as a very light regulatory regieme that will preclude

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[22] *See, e.g., In the Matter of Access Charge Reform*, CC Docket No. 96-262, Fifth Report and Order and Further Notice of Proposed Rulemaking, 14 FCC Rcd 14221, 14328-30, paras. 211-16 (1999) (*Pricing Flexibility Order and NPRM*).

[23] *See* "Bill and Keep at the Central Office As the Efficient Interconnection Regime," Federal Communications Commission Office of Plans and Policy, OPP Working Paper Series #33, December 2000.

ISPs from abusing their position as terminating access monopolies and will help ensure more efficient pricing in the IP market. However, without such safeguards, ISPs will certainly begin to abuse this power in a manner that will destroy efficiency and beckon the Commission to take on the highly regulatory task of price setting at a latter date, as they are bound to by statute. If the ICC debate has taught us anything, it is that reigning in terminating access monopoly power once it has been exercised is a very difficult task.

The Truth about Congestion and Network Investment

In the *Notice* the Commission notes that they "must balance the need for incentives for infrastructure investment with the need to ensure that network operators do not adopt congestion management measures that could undermine the usefulness of the Internet to the public as a whole."[24] As we noted above, the incentives the Commission references are hardly centered on the outcome of this proceeding. Nonetheless, the Commission is certainly correct in noting the potential consequences of discriminatory congestion management techniques. Given the history of this issue, we begin our discussion of the issue by attempting to ensure the proceeding follows Chairman Genachowski's call for "an informed, fruitful discussion about issues of real importance to the future of the Internet and our country."[25] The debate surrounding the issue of congestion has unfortunately failed to meet this standard in the past. Therefore, here we attempt to preemptively dispel common myths that exist on this topic.

Net Neutrality opponents have frequently claimed that traffic increases are "skyrocketing."[26] For instance, during the debate over Comcast's network management practices, the Company warned the Commission "one recent study reports that user demand for the Internet could outpace network capacity by 2010."[27] This has long been used as a primary reason why discrimination must occur. That is, these large traffic increases will lead (or in some case is presented as having already led) to serious congestion issues that can only be solved through discriminatory network management practices and new revenue streams based on discrimination. Without these 'tools', network providers claim they will simply be unable to keep pace. This storyline is commonly referred to as the "exaflood."[28] We believe it is helpful to compile the relevant *data* on traffic levels, not just accept this rhetoric as reality. The following offers existing and/or future estimates of annual U.S. or specific network traffic growth rates:

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[24] *Notice* at para. 80.

[25] Statement of Julius Genachowski, In the Matter of *Preserving the Open Internet*, GN Docket 09-191; *Broadband Industry Practices*, WC Docket No. 07-52, Oct. 22, 2009.

[26] Comments of Hands Off the Internet, In the Matter of *Formal Complaint of Free Press & Public Knowledge Against Comcast Corp. for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices; Petition of Free Press et al. for Declaratory Ruling That Degrading an Internet Application Violates the FCC's Internet Policy Statement & Does Not Meet an Exception for "Reasonable Network Management*," WC Docket No. 07-52, p. 10 (Feb. 13, 2009).

[27] Instead, we see MVPD's introducing initiatives like TV Everywhere. *See e.g.* Stacey Higginbotham, "Will TV Everywhere Swamp Cable Networks?," *GigaOm*, July 31, 2009.("Charlie Douglas, a Comcast spokesman, says that the company isn't concerned about the effect TV Everywhere will have on the network"). *See* Reply Comments of Comcast Corporation, In the Matter of *Formal Complaint of Free Press & Public Knowledge Against Comcast Corp. for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices; Petition of Free Press et al. for Declaratory Ruling That Degrading an Internet Application Violates the FCC's Internet Policy Statement & Does Not Meet an Exception for "Reasonable Network Management*," WC Docket No. 07-52, p. 12 (Feb. 28, 2008).

[28] *See e.g.* Comments of AT&T, In the Matter of *Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices, Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management,"* File No. EB-08-IH-1518, WC Docket No. 07-52, p. 7 (Feb. 13, 2008).

- U.S. Cable Systems: 39%[29]
- AT&T's Backbone: 35%[30]
- Verizon's Global IP Traffic: 40%+[31]
- Comcast: 42%[32]
- Cisco Systems Forecast: 40%[33]
- TeleGeography Report: 36%[34]
- University of Minnesota's MINTS: 40-50%[35]
- ATLAS Internet Observatory: 44.5%[36]
- ISP Survey: 35-45%[37]

Thus we see that numerous sources show that growth rates hover around 40 percent. This growth figure is far lower than those witnessed in previous years.[38] Furthermore, no financial evidence has been presented illustrating a high increase in costs due to traffic increases such as a large increase in transit costs or capital expenditures.[39] Indeed, TeleGeography found that on the 20 highest capacity U.S. routes, peak traffic is only 37% of total available bandwidth.[40] Undoubtedly IP transit upgrades have been and are occurring but no evidence has been presented showing these costs are outpacing

[29] *See* Technical Advisory Process Workshop on Broadband Network Management, Presentation by Paul Liao, CableLabs, Inc, "Cable Network Operating and Planning Considerations," slide 15, Dec. 8, 2009.

[30] *See* Technical Advisory Process Workshop on Broadband Network Management, Presentation by Bill Smith, President, AT&T Local Network Operations, slide 4, Dec. 8, 2009.

[31] Speech by Ivan Seidenberg, CEO of Verizon Communications, Supercomm 2009, Oct. 21, 2009.

[32] Comments of Comcast Corporation, In the Matter of *A National Broadband Plan for Our Future*, GN Docket No. 09-51, p. 36 (2009).

[33] Cisco Systems, "Cisco Visual Networking Index: Forecast and Methodology 2008-2013," 2009.

[34] Executive Summary of TeleGeography Research, "Global Internet Geography United States," PriMetrica Inc., p. 3, 2009.

[35] Andrew Odlyzko, "Minnesota Internet Traffic Studies (MINTS)," University of Minnesota, 2009.

[36] Notable the study states "Significant Growth, but no "Exaflood"," *See* ATLAS Internet Observatory, "2009 Annual Report," p. 29, Pre-Publication Draft from NANOG.

[37] *Ibid.*

[38] "In the United States, there was a brief period of "Internet traffic doubling every 100 days" back in 1995-96, but already by 1997 growth subsided towards an approximate doubling every year, and more recently even that growth rate has declined towards 50-60% per year." Andrew Odlyzko, "Minnesota Internet Traffic Studies," University of Minnesota, 2009. (hyperlinks omitted)

[39] For instance, Time Warner Cable had 8.4 million high-speed data customers and high-speed data revenues of $4.2 billion in 2008. Yet, the company's high-speed data "costs of revenues" were $146 million in 2008 (down 11% from 2007). Furthermore, Time Warner Cable projected bandwidth costs for 2009 will only be $40 million. Time Warner Cable Inc. Form 10-K, Feb. 20, 2009, pp. 1, 60, 78, 89. Indeed, a recent study notes IP transit prices have "declined by 20 to 30 percent annually since 2007 in major hub cities." Executive Summary of TeleGeography Research, "Global Internet Geography United States," PriMetrica Inc., p. 1, 2009.

[40] *See* Robert C. Akinson & Ivy E. Schultz, "Broadband in America – Where It Is and Where It Is Going (According to Broadband Service Providers)," Columbia Institute for Tele-Information, Nov. 11, 2009, pp. 54-55. *See also e.g.* Edward Cone, "Is the Internet Ready to Break?," *CIO Insight*, April 4, 2007.

incoming revenue or falling behind demand. The Commission should dismiss any hand-waving on traffic increases until both network and financial data is provided to illustrate such a claim.

Another reason opponents of net neutrality advocate for discrimination is because so called "bandwidth hogs" are using a disproportionately large amount of capacity.[41] That is, these customers are presented by ISPs as using an excessive amount of network resources and this must be limited in some way. Many times these arguments are accompanied by statistics like 5 percent of subscribers account for 50 percent of consumption.[42] Unfortunately, these arguments ignore a reality. A customer who consumes large quantities of information *may or may not* also be contributing to congestion (i.e. they download large amounts of data during off peak times; or they use a low-bandwidth two-way video device, but use it in an always-on fashion).

Network congestion is an issue that should arise rarely and only during peak hours. In other words, if a user generates a considerable amount of traffic, but does so between the hours of 1am and 5am, he will likely have no effect on the duration of congestion. That is to say, congestion and network usage are distinct. As we note above, financial evidence that large increases in transit prices are occurring for large network operators has not been presented. In fact, this reality suggests that if the Commission should be concerned with any subset of users it is the 80 percent of users who only consume 20% percent of the bandwidth.[43] Under the ISPs lens of "fairness", these customers appear to be consuming far less than they pay for. Regardless, the Commission should be wary of any claims that attempt to blame users for congestion problems.

The Commission should view attempts to justify discriminatory responses to congestion with considerable skepticism. A recent incident in Canada highlights this fact. In this Canadian Radio-television and Telecommunications Commission (CRTC) proceeding, Bell Canada had claimed it had to throttle peer-to-peer (P2P) traffic (for both wholesale and retail customers) because of the "increased levels of congestion" occurring in the network.[44] They claimed, "bandwidth hogs" had "crowd[ed] out" other users.[45] In response, the CRTC requested data illustrating the presence of ubiquitous congestion. Retail ISPs, who rely on Bell Canada's network for access, requested that this data, which was filed confidentially, be made public.[46] The CRTC determined "no specific direct harm would likely result from disclosure"[47] The data's subsequent publication revealed that the number of congested DSLAM links on Bell Canada's network to be 5.2 percent, with other areas of the network far lower.[48] Furthermore, Bell Canada's internal definition for being "congested" was "very high" meaning

[41] *See e.g.* Andy Patrizio, "Comcast Suspected of Limiting BitTorrent Use," InternetNews.com, October 19, 2007. Of course, high consumption users are hardly a new phenomenon. *See e.g.* Ex Parte of Comcast Corporation, In the Matter of *Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities,* CS Docket 02-52, p. 2 (April 7, 2004).

[42] *See e.g.* Comments of AT&T, Inc., In the Matter of *Broadband Industry Practices*, WC Docket No. 07-52, p. 76 (June 15, 2007).

[43] *See e.g.* Technical Advisory Process Workshop on Broadband Network Management, Presentation by Paul Liao, CableLabs, Inc, "Cable Network Operating and Planning Considerations," slide 16, Dec. 8, 2009.

[44] Filing of Bell Canada to Canadian Radio-television and Telecommunications Commission, File No. 8622-C51-200805153, p. 4, April 15, 2008.

[45] *See e.g.* Roberta Rocha, "Bell targets 'bandwdith hogs'," *The Gazzette*, April 10, 2008.

[46] Filing of Canadian Association of Internet Providers to Canadian Radio-television and Telecommunications Commission, File No. 8622-C51-200805153, June 6, 2008.

[47] Letter from Paul Godin, Director General, Competition, Costing and Tariffs, Telecommunications, Canadian Radio-television and Telecommunications Commission to Mirko Bibic, Chief, Regulatory Affairs, Bell Canada, June 19, 2008.

[48] *See e.g.* Nate Anderson, "Bell Canada: congestion numbers look low, but actually aren't," *Ars Technica*, June 25, 2008.

the congestion mechanism was triggered more easily than might be expected.[49] Based on this information, longtime industry analyst Dave Burstein estimated that the costs to prevent this congestion from occurring (and thus the P2P throttling) "should cost $4 million to $40 million, or $2 to $20 per customer."[50] Burstein went on to note that the in previous quarter the company had reduced their capital expenditures by 25 percent from the year before.[51] Thus, despite blaming users for network congestion, the fault fell on Bell Canada's failure to invest.

Of course, the Commission experienced similar misdirection during its investigation of Comcast's blocking of BitTorrent. The Company stated their practice was required in order to "avoid degradation caused by congestion",[52] going on to call the practices "necessary…in order to ensure that *all* users have a reliable, high-quality Internet experience."[53] Comcast asserted that any action by the Commission "could threaten innovation and consumer welfare."[54] A few months later, the Commission looked past these wild claims and acted on behalf of consumers.[55] Of course, "as of December 31, 2008, Comcast ha[d] ceased employing the congestion management practices" at issue. Yet, six months later Comcast stated, "the Internet ecosystem is thriving."[56] Indeed, while we strongly disagree, the company felt compelled to note that both "broadband Internet service and availability in this country are very good."[57]

Most, if not all, entities involved in this debate recognize that congestion is going to occur within networks at certain times. This is due to the reality that communications networks are oversubscribed. Oversubscription takes advantage of the fact that all customers will not be concurrently using their broadband service. This practice can lead at times to congestion. The definition of when a network has become "congested" is not uniform. That is, network providers decide this metric for themselves. Nonetheless, the definition still relies on when network traffic has

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[49] In general, a high standard for congestion is a positive because it means the network traffic will reach a lower utilization point before acting to address the problem. However, when the solution to this environment is discrimination rather then reasonable network management followed closely by investment, having such a high standard means discrimination occurs more often. Thus, an operator's definition of what network utilization level qualifies as congested and how they respond is a critical component to this proceeding. Dave Burstein, "Bell Canada's Claims," *DSL Prime*, July 2, 2008.

[50] Burstein further noted that this was "an insignificant amount" given that the company has "a margin upward of $200/per year per customer." *Id.*

[51] *Id.*

[52] Comments of Comcast Corporation, In the Matter of *Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices, Petition of Free Press et al. for Declaratory*

Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management," File

No. EB-08-IH-1518, WC Docket No. 07-52, p. 27 (Feb. 13, 2008).

[53] Reply Comments of Comcast Corporation, In the Matter of Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices, Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management," File No. EB-08-IH-1518, WC Docket No. 07-52, p. 23 (Feb. 28, 2008).

[54] *ibid.* at 39.

[55] *See Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices, Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management,"* File No. EB-08-IH-1518, WC Docket No. 07-52, Memorandum Opinion and Order, 23 FCC Rcd 13028 (2008).

[56] Comments of Comcast Corporation, In the Matter of *A National Broadband Plan for Our Country*, GN Docket No. 09-51, p. 2 (June 8, 2009).

[57] *Ibid.* at 45.

reached a certain 'utilization level'.[58] In other words, the point at which traffic has reached a certain percentage of capacity. For instance, Comcast defines their "Near Congestion State" as a "utilization threshold" of 80 percent for downstream traffic and 70 percent for upstream.[59] When a network hits this pre-determined level of traffic, many providers will employ congestion management techniques.

Recent history has shown that some providers will interfere with traffic before this state is reached in order to artificially reduce the frequency in which a congestion threshold is reached.[60] The reason for this is that reaching these utilization levels is a clear sign that investment in network upgrades is necessary. For instance, Comcast has publicly claimed it puts in a work order for an upgrade once the network reaches a utilization point of 70 percent for one hour a day for five consecutive days.[61] Providers can also simply delay these upgrades, leading to serious service degradation, especially during peak hours.[62] While the use of oversubscription is standard and efficient, it also can be abused, preventing subscribers from achieving the capacity advertised for any reasonable duration. Thus, a fine line exists between congestion management and deferred investment.

The Commission should recognize that artificial deterrents to a congested state being reached and how a provider responds to a congested state are critical components of this proceeding. In short, congestion should be infrequent and quickly accompanied by investment. The Commission's goal should be to ensure providers do not deviate from this general practice.[63] The Commission should also recognize that advances in technology have rendered many of these investments quite inexpensive. In the case of Time Warner Cable, they claim that these upgrades are "not significant from a total capital spend viewpoint".[64] Indeed, Comcast claims the cost of upgrades range from a little over $3 to $26 per home passed.[65] As all indicators suggest that large Internet access providers are experiencing extremely healthy returns, the Commission should take the steps necessary in this proceeding to ensure investment keeps pace with customer's usage. In this environment, providers have no justification for interference occurring outside of the brief periods of congestion that occur before further investment is necessary. Thus, the burden of proof lies with providers to explain why the historic practice of investment is no longer working, not to mention disclose any and all interference they may be practicing within their network.

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[58] *See e.g.* Filing of Bell Canada to Canadian Radio-television and Telecommunications Commission, File No. 8622-C51-200805153, Supplemental, p. 3, June 23, 2008. ("A common practice in the Industry and network management is to develop thresholds at which the utilization level in a link has a very high probability of producing negative impacts on end-users.")

[59] Letter from Kathryn A. Zachem, Vice President, Regulatory Affairs, Comcast Corporation to Marlene Dortch, Secretary, Federal Communications Commission, In the Matter of *Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications, Broadband Industry Practices; Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management,"* File No. EB-08-IH-1518, WC Docket No. 07-52, Attachment B, p. 8 (Sept. 19, 2008). ("*Comcast Disclosure Filing")*

[60] In their disclosure to the Commission, Comcast admitted their previous technique was performed whether or not the network was in a congested state. *See ibid.* at Attachment A, p. 4.

[61] Stacey Higginbotham, "Comcast Clarifies Its Network Management Efforts Again," *GigaOm*, July 22, 2008.

[62] *See e.g.* Commission Open Meeting Presentation on the Status of the Commission's Processes for Development of a National Broadband Plan, Sept. 29, 2009, Slide 26; Sam Crawford, "Performance Monitoring Report," SamKnows, Feb. 8, 2008, p. 29-32; Ofcom, "UK broadband speeds 2009: Research Report," July 28, 2009, p. 8; Organization of Economic Co-operation and Development, "OECD Communications Outlook 2009," August 2009, pp. 108-113.

[63] With the ubiquitous deployment of advanced deep packet inspection equipment this may be far more difficult than it sounds. *See* Section IV. C. *infra.*

[64] Leslie Ellis, "How Sexy is HFC? (Answer: Plenty.)" *CED Magazine*, May 1, 2007.

[65] Jeff Baumgartner, "Comcast Preps Docsis 3.0 Trials, *Cable Digital News*, May 1, 2007.

Congestion plays a big role in this proceeding. The Commission should recognize that many claims in favor of discrimination due to congestion obfuscate the facts. These claims stall rather than move the discussion surrounding an open Internet forward. Before affording them any weight, the Commission must ensure that opponents' claims are justified with comprehensive data from network traffic, network management and financial arenas.

Preserving the Open Internet is Essential to Continue the Unprecedented Level of Investment and Innovation in Content and Applications Markets, as Well as Other Markets that Use the Internet as a Basic Underlying Infrastructure

Much of the rhetoric directed against network neutrality policy centers on the claim that this basic rule of the road will somehow deter network operators from making future investments in their core business. As the above discussion shows, these claims are completely unsupported by all available data. Likewise, common sense judgment about the likely nature of the discrimination business indicates that the hysterical rhetoric about net neutrality is nothing but a smokescreen designed to scare policymakers from continuing the 75-plus year history of protecting the open and non-discriminatory facets of our nation's two-way communications networks. The simple fact is that network neutrality will act as a very light regulatory firewall ensuring that ISPs do not abuse their market power. Network neutrality will also ensure that the right market signals are present, encouraging ISPs to make efficient and profitable network investments and discouraging them from profiting from artificial scarcity.

So while the impact of Network Neutrality obligations on network investment is likely negligible -- or positive -- the absence of nondiscrimination protections will have a large impact on investments made in the application and content markets. Currently, the Internet is an open platform, governed by a universally accepted and agreed upon set of technical standards. This open platform provides online innovators with a high degree of predictability about a major segment of their business. An innovator knows that she can develop a new idea or application, and that it will work on any end user's Internet-connected device. The innovator does not need to go to every ISP and ask for "permission to innovate."[66]

But without Network Neutrality, this certainty is destroyed. A particular network provider might already have an exclusive deal with the innovator's competitor -- a deal stipulating that the ISP block or degrade all competitive traffic. Or the ISP may treat the innovator's underlying network protocol differently than other ISPs, making it almost impossible to design an application that is guaranteed to work properly. This potential for discriminatory treatment and nonstandard network management could destroy investor confidence in the applications market, stifling growth in the one segment that drives the information economy. The Internet would become balkanized, whereby

[66] *See* Prepared Statement of Vinton G. Cerf, Vice President and Chief Internet Evangelist Google Inc., before the U.S. Senate Committee on Commerce, Science, and Transportation, on the matter of Network Neutrality, Feb. 7, 2006. "In the zone of governmental noninterference surrounding the Internet, one crucial exception had been the nondiscrimination requirements for the so-called last mile. Developed by the FCC over a decade before the commercial advent of the Internet, these 'Computer Inquiry' safeguards required that the underlying providers of last-mile network facilities – the incumbent local telephone companies – allow end-users to choose any ISP, and utilize any device, they desired. In turn, ISPs were allowed to purchase retail telecommunications services from the local carriers on nondiscriminatory rates, terms, and conditions. The end result was, paradoxically, a regulatory safeguard applied to last-mile facilities that allowed the Internet itself to remain open and 'unregulated' as originally designed. Indeed, it is hard to imagine the innovation and creativity of the commercial Internet in the 1990s ever occurring without those minimal but necessary safeguards already in place. By removing any possibility of ILEC barriers to entry, the FCC paved the way for an explosion in what some have called 'innovation without permission.' A generation of innovators ... [was] able to offer new applications and services to the world, without needing permission from network operators or paying exorbitant carrier rents to ensure that their services were seen online. And we all have benefited enormously from their inventions."

applications that work on one network would not work on another. The entire premise of a globally interconnected system of communications that is fully interoperable with all content and applications would be undermined.

Open Internet Protections are Essential Regardless of the State of Last Mile ISP Competition

In the *Notice* the Commission asked, "to what extent are particular arguments [in support of open Internet policies] independent of competitive conclusions regarding particular markets for broadband Internet access services?"[67] We strongly believe that these basic protections are required regardless of how competitive the market is. This belief is grounded in theory,[68] in history, and in the law itself. Simply put, two-way communications networks are so essential to the basic functioning of society that efficient nondiscriminatory interconnection must be preserved, and the fundamental nature of end-user communications providers as terminating access monopolies means the threat to interconnections will remain regardless of competition.

To answer the question of the role of competition, the Commission need look no further than the law itself. The principle of nondiscrimination is so important that Congress intended for it to apply even in markets where effective competition exists. This is because the outcome that nondiscrimination produces -- openness -- is so essential to maintain.

Congress recognized that once competition developed in the Internet access markets, certain regulations (such as Section 251 unbundling) would no longer be necessary or productive. So it gave the FCC explicit power to decide when to lift certain regulations. But because Congress was not convinced that competition alone would be enough to preserve the open nature of communications platforms, it put a structure in place that would always require carriers to abide by the principle of nondiscrimination. In Section 10 of Title I (47 U.S.C. 160) of the 1996 Act, Congress gave the Commission the authority to forbear from applying regulations on telecom carriers if a determination is made that "enforcement of such regulation or provision is not necessary to ensure that the charges, practices, classifications, or regulations by, for, or in connection with that telecommunications carrier or telecommunications service are just and reasonable and are not unjustly or unreasonably discriminatory, [or] enforcement of such regulation or provision is not necessary for the protection of consumers."

Thus, Congress allowed the discontinuance of regulations so long as they were not needed to ensure a specific desired outcome -- *just, reasonable and non-discriminatory treatment*. But the outcome itself remained paramount. Indeed, this is made quite clear in Section 332(c)(1)(A) of the Act (and in Section 10 itself, which refers to this specific passage), which gives the FCC the authority to selectively apply Title II regulations to commercial mobile service (CMRS) carriers, but specifically forbids the FCC from removing CMRS providers from an obligation to adhere to Sections 201, 202 and 208 of the Act.

The FCC's entire history of intervention in communications and information services markets up until 2002 was based upon a deep understanding of network operators' natural incentive to control content. Keeping this incentive in check is what motivated the *Computer II* structural separation rules[69],

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[67] *Notice* at 81.

[68] *See* Barbara Van Schewick, "Towards an Economic Framework for Network Neutrality Regulation," *Journal on Telecommunications and High Technology Law*, Vol. 5, pp. 329-391 (2007).

[69] In general, structural separation in the Internet context is a regulatory regime in which the owner of the network infrastructure is required to form a structurally separate corporate entity for selling Internet access. This separate entity must purchase the network access from the parent company at the same rates and terms that are made available to other ISPs

and it is why to this day the Commission has yet to grant any telecom carrier forbearance from Section 201 (a requirement to provide reasonable access) and Section 202 (a requirement to not unreasonably discriminate in offering that access).[70] Sections 201 and 202 are built around the principle of nondiscrimination and are intended to protect the public interest regardless of technology or the level of market competition. Indeed, in a 1998 denial of a forbearance petition, the Commission stated:

> "Assuming all relevant product and geographic markets become substantially competitive, moreover, carriers may still be able to treat some customers in an unjust, unreasonable, or discriminatory manner. Competitive markets increase the number of service options available to consumers, but they do not necessarily protect all consumers from all unfair practices. The market may fail to deter providers from unreasonably denying service to, or discriminating against, customers whom they may view as less desirable… providers may, in the absence of sections 201 and 202, have the opportunity and incentive to treat some of their existing customers in an unjust, unreasonable, and discriminatory manner, as compared with similarly situated potential new customers." [71]

The Commission's recognition of the importance of nondiscrimination rules in preventing carriers from exercising control over content extends into other areas of law such as pole-attachment rights.[72] And concern about control over content is even present in Commission rules that govern cable leased-access regulations and program-access rules.[73]

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[70] While it is true that no carrier has received forbearance from Sections 201 and 202, the Commission's complete removal of broadband Internet access service from Title II accomplished the same outcome. See *Petition of SBC Communications Inc. for Forbearance from the Application of Title II Common Carrier Regulation to IP Platform Services*, WC Docket No. 04-29, Memorandum Opinion and Order, 20 FCC Rcd 9361 (2005), at para. 17, stating, "The Commission has never forborne from applying sections 201 and 202 of the Act. In a 1998 order denying a petition for forbearance from sections 201 and 202 of the Act (among other sections), the Commission described those sections as the cornerstone of the Act. The Commission explained *that even in substantially competitive markets, there remains a risk of unjust or discriminatory treatment of consumers*, and sections 201 and 202 therefore continue to afford important consumer protections. Because the language of section 10(a) essentially mirrors the language of sections 201 and 202, the Commission expressed skepticism that it would ever be appropriate to forbear from applying those sections. Since then, the Commission has never granted a petition for forbearance from sections 201 and 202. If we were to grant such a petition now, we would have to provide a rationale for abandoning our own precedent" (emphasis added, internal footnotes omitted).

[71] See *Personal Communications Industry Association's Broadband Personal Communications Services Alliance's Petition for Forbearance for Broadband Personal Communications Services*, WT Docket No. 98-100, Memorandum Opinion and Order and Notice of Proposed Rulemaking, 13 FCC Rcd 16857 (1998) at 16868-69, para. 23. This view of the central importance of Sections 201 and 202 was affirmed by the Commission in 2005. See *Petition of SBC Communications Inc. for Forbearance from the Application of Title II Common Carrier Regulation to IP Platform Services*, WC Docket No. 04-29, Memorandum Opinion and Order, 20 FCC Rcd 9361 (2005) at 9368, para. 17.

[72] *See* e.g., *AT&T Enterprise Forbearance Order* (*supra* note 158 at. paras. 67-68) where the commission stated, "For example, the protections provided by sections 201 and 202(a), coupled with our ability to enforce those provisions in a complaint proceeding pursuant to section 208, provide essential safeguards that ensure that relieving AT&T of tariffing obligations in relation to its specified broadband services will not result in unjust, unreasonable, or unreasonably discriminatory rates, terms, and conditions in connection with those services. ... In particular, many of the obligations that Title II imposes on carriers or LECs generally, including interconnection obligations under section 251(a)(1) and pole attachment obligations under sections 224 and 251(b)(4), *foster the open and interconnected nature of our communications system*, and thus promote competitive market conditions within the meaning of section 10(b)" (emphasis added).

[73] *See* e.g., 47 U.S.C. 536, "Regulation of Carriage Agreements" (establishing rules preventing cable operators from unfair treatment of programming vendors); 47 U.S.C. 548, "Development of Competition and Diversity in Video Programming Distribution" (establishing general non-discriminatory program access provision); and 47 U.S.C. 532, "Cable Channels for Commercial Use" (providing conditions for leased access).

So even if the implementation of the 1996 Act were flawed, and today's communications marketplace were sufficiently competitive to no longer require unbundling regulations, tariffs, or structural separation -- nondiscrimination protections would still be needed to ensure consumer access to open platforms. This is necessary because network operators have strong incentives to exert power and control in adjacent markets. In the case of the Internet, this obviously includes the ISP access and device markets, but it also includes the applications and content markets -- all of which were the "enhanced services" at the core of the *Computer Inquiries*

This lesson is made apparent by looking at other countries that have much more competitive ISP markets (thanks to successful implementation of open access policy) but are still wrestling with the same net neutrality issues as the U.S. A prime example is the U.K., where incumbent phone and cable companies control less than half of the market[74] (unlike the U.S. where they control more than 95 percent).[75] In this market, where competition is working to boost speeds and lower prices, ISPs are still contemplating throttling or outright blocking certain types of content unless they are paid a discriminatory terminating access fee.[76]

Thus, as a result a of its very nature, two-way communications networks must always be protected by the principle of nondiscrimination, regardless of the level of marketplace competition. Nonetheless, the need for such a rule becomes even starker when one considers the lack of broadband competition that *currently* exists in the United States. We have offered evidence of broadband duopoly in numerous comments before the Commission, while extensively and repeatedly rebutting the competition claims made by incumbents.[77] The National Telecommunications and Information Administration,[78] Department of Justice,[79] Federal Trade Commission,[80] Chairman Genachowski,[81] and

[74] Unlike the United States, the incumbent cable and telephone companies in the United Kingdom have only a 50 percent share of the broadband market. Competitive carriers that resell, wholesale and unbundle network elements from BT (the U.K. incumbent telecom carrier) control half the U.K. market. See Comments of Time Warner Telecom, GN Docket No. 07-45, May 16, 2007, Appendix A (Sheba Chacko, "UK: Investment, Innovation and Competition Enabled by Regulation," BT Presentation, April 2007, Washington D.C). This arrangement has led to early and accelerated deployment of advanced VDSL technologies by these competitive carriers, offering users speeds in excess of 24Mbps. In turn, this competitive deployment appears to have encouraged BT to finally offer its own VDSL2+ services. See *June 2008 OECD Data* (showing 24Mbps DSL services, but only 8Mbps DSL services available from BT); *See also* "BT Rolls Out Faster Broadband", *BBC News*, April 30, 2008, available at http://news.bbc.co.uk/2/hi/technology/7376173.stm. According to the latest FCC data, nearly two-thirds of all residential and business DSL lines in the United States had downstream speeds of less than 2.5Mbps. *See* "High-Speed Services for Internet Access as of December 31, 2007," Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission, Table 5 (*December 2007 FCC Form 477 Data*).

[75] *See* S. Derek Turner, "Dismantling Digital Deregulation," Free Press, May 2009, at Figure 6.

[76] *See* Tom Espiner, "BT wants BBC to pay for iPlayer," ZDNet UK, June 11, 2009.

[77] *See e.g.* Reply Comments of Free Press, In the Matter of *A National Broadband Plan for Our Future*, GN Docket No. 09-51, pp. 37, n. 89, 35-53 (July 21, 2009) ("*NBP Reply Comments*"); Comments of Free Press, In the Matter of *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, *A National Broadband Plan for Our Future*, GN Docket Nos. 09-137, 09-51, pp. 17-54 (Sept. 4, 2009) ("*706 Comments*"); Reply Comments of Free Press, In the Matter of *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, *A National Broadband Plan for Our Future*, GN Docket Nos. 09-137, 09-51, pp. 9-11 (Oct. 2, 2009); Comments of Free Press, In the Matter of *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, *A National Broadband Plan for Our Future*, *International Comparison and Survey Requirements in the Broadband Data Improvement Act*, GN Docket Nos. 09-137, 09-51, 09-47, pp. 4-6 (Dec. 4, 2009).

[78] Comments of the National Telecommunications and Information Administration, In the Matter of *A National Broadband Plan for Our Future*, GN Docket No. 09-51, p. 6 (Jan. 4, 2010). ("We urge the Commission to examine what in many areas of the country is at best a duopoly market and to consider what, if any, level of regulation may be appropriate to

the National Broadband Plan team have all recognized this lack of broadband competition.[82] The indisputable fact is that consumers currently have at best two choices for broadband Internet access service.

In the *Notice*, when discussing "the current adequacy of competition", the Commission offers a single line to sum up opponents' position that the market is "sufficiently competitive."[83] A bold claim to be sure, given basic well-understood marketplace reality; so what lies beneath this claim? The citation is to a 2008 Harvard Law Review article by Daniel F. Spulber & Christopher S. Yoo.[84] The paper focuses on the topic of open access regulation, despite a deliberate attempt to confuse that regulatory issue with Network Neutrality.[85] Nonetheless, we have followed the citations used within the Spulber/Yoo paper to argue that a competitive market exists, and would like to make the Commission aware just how flimsy these arguments are. In attempting to justify the assertion a competitive market, the Authors fail to offer anything that could be viewed as legitimate evidence.

First, Yoo and Spulber point to Verizon's FiOS service but fail to note that Verizon removes the copper line to a home upon installing FiOS.[86] Thus, this service does not introduce a new competitor but simply increases the capabilities of an existing one. Following this, the authors point to mobile wireless as a technology whose service is "soaring…to capture 13% of the market…by the middle of 2007."[87] They go on to state mobile wireless has become the "industry leader" if high-speed lines are looked at in totality.[88] The authors rely on FCC Form 477 data to make these assertions, yet fail to note this data has been widely criticized for being badly flawed.[89] In fact, the Commission itself admitted the problems with the mobile wireless collection methodology and changed its data collection methods.[90] Spulber and Yoo acknowledge this Commission Order, yet fail to note this highly relevant

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govern the behavior of duopolists.")

[79] Ex Parte of the United States Department of Justice, In the Matter *A National Broadband Plan for Our Future*, GN Docket No. 09-51, p. 14 (Jan. 4, 2010). ("Unfortunately, even in areas where two wireline networks are deployed, consumers seeking to use the most bandwidth-intensive applications may not have more than a single viable choice.")

[80] Comments of the Federal Trade Commission, In the Matter of *A National Broadband Plan for Our Future*, GN Docket No. 09-51, p. 4 (Sept. 4, 2009). ("Currently, relatively large market shares for fixed, wireline broadband services are typically held by a single incumbent cable operator and a single incumbent telephone company in each geographic area.")

[81] Prepared Remarks of Chairman Julius Genachowski, The Brookings Institution, Sept. 21, 2009. ("One reason has to do with limited competition among service providers. As American consumers make the shift from dial-up to broadband, their choice of providers has narrowed substantially.")

[82] *See e.g.* Commission Open Meeting, Presentation on the Status of the Commission's Processes for Development of a National Broadband Plan, p. 135 (Sept. 29, 2009). ("At most 2 providers of fixed broadband services will pass most homes")

[83] *Notice*at para. 74.

[84] *See ibid.* at para. 74, n. 170.

[85] Daniel F. Spulber & Christopher S. Yoo, *Rethinking Broadband Internet Access*, 22 HARV.J.L.& TECH. 1, pp. 4, 19 (2008). ("*Spulber/Yoo Paper*")

[86] *Ibid.* at 9. *See* Carol Wilson, "Cutting the copper cord creates minor controversy," *Telephony Online*, Oct. 17, 2005. *See also e.g.* Kelly M. Teal, "Copper Retirement Notices Stack Up - CLECs Ask FCC for Formal Review," *XChange Magazine*, June 29, 2007.

[87] *Spulber/Yoo Paper* at 9.

[88] *Ibid.* at 9-10.

[89] *See e.g.* "Broadband Deployment is Extensive throughout the United Sates, but it is Difficult to Assess the Extent of Deployment Gaps in Rural Areas", United States Government Accountability Office, Report to Congressional Committees, GAO-06-426, May 2006.

[90] *Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data on Interconnected Voice over Internet Protocol (VoIP) Subscribership*, WC Docket No. 07-38, Report and Order and Further Notice of Proposed Rulemaking, 23 FCC Rcd 9691, 9703 (2008).

admission by the Commission.[91] Furthermore, the authors fail to mention that even the flawed data they used shows the ILEC share of mobile wireless to be over 80 percent.[92] They also fail to acknowledge numerous other realities that illustrate mobile wireless to be a complement rather than a substitute.[93] The paper also points to competition that will "emerge" from unlicensed wireless technologies like "Wi-Fi and WiMax".[94] Later they also include "satellite broadband networks, and other last-mile technologies" stating these technologies will "cause intermodal competition to intensify even further in the future."[95] Unfortunately these assertions go completely without citation. Thus, we see a typical case of providing 'evidence' for the existence of an "adequately competitive" broadband market.

In the *Notice* the Commission also requested analysis of the "future adequacy of competition and market forces."[96] As consumers continue to demand higher speeds, the state of broadband competition should be expected to deteriorate further.[97] DSL providers simply cannot offer these superior speeds. According to current deployment plans, phone companies will only upgrade to an FTTx network architecture in 40 percent of the country.[98] This creates the concerning development that in more than half of the country, cable operators will be the only option for consumers. Indeed, cable operators have already begun adding subscribers at much higher rates than phone companies.[99] The national broadband team recently noted that in upcoming years "50-80% of homes may get [the] speeds they need from only one provider."[100] In this environment, consumers require a vigilant regulator and at the very least the bedrock principle of non-discrimination.

Network Neutrality Will Have No Impact on Certain ISPs Already Pending Desires to Gouge Their Customers Using Internet Overcharging Billing Schemes

With the Commission's decision in the *Comcast* case, it made it clear that blocking the use of a specific application -- in this case, the popular peer-to-peer file-sharing protocol BitTorrent -- is not a reasonable way for Internet Service Providers to manage their networks. The Commission's action promoted some skeptical observers to speculating that the decision could have unintended consequences.[101] The basic line of argument is that because application blocking is out of bounds, providers now will be forced to use some type of "metering" to control network congestion. For

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[91] *See Spulber/Yoo Paper* at 6, n. 21.

[92] See *June 2007 FCC Form 477 Data,* Table 6.

[93] *See e.g. NBP Reply Comments* at 40-44, *706 comments* at 46 n. 109.

[94] *Spulber/Yoo Paper* at 10.

[95] *Ibid.* at 27.

[96] *Net Neutrality NPRM* at para. 61.

[97] For a more detailed discussion of this development, *see 706 comments* at 48-52.

[98] *See e.g.* Eric Savitz, "Cable Vs. Wireless: Guess Which Is Growing Faster?" *Barron's Tech Trader Daily*, Aug. 21, 2009.

[99] *See e.g.* Leichtman Research Group, "Over 900,000 Add Broadband in the Third Quarter of 2009," Press Release, Nov. 13, 2009.

[100] Commission Open Meeting, Presentation on the Status of the Commission's Processes for Development of a National Broadband Plan, p. 135 (Sept. 29, 2009). *See also* Ex Parte of the United States Department of Justice, In the Matter *A National Broadband Plan for Our Future*, GN Docket No. 09-51, p. 14 (Jan. 4, 2010). ("Unfortunately, even in areas where two wireline networks are deployed, consumers seeking to use the most bandwidth-intensive applications may not have more than a single viable choice.")

[101] For example *see*, Therese Poletti, "FCC's Slap on Comcast May Have Dark Side", *Market Watch*, August 5 2008. Available at http://www.marketwatch.com/news/story/story.aspx?guid=%7B55F92CF7-A740-45A0-A173-3C685F609EEF%7D&siteid=rss; also *see* Om Malik, "Yo FCC! Are You Doing Anything About Metered Broadband?", *GigaOM*, July 30 2008. Available at http://gigaom.com/2008/07/30/fcc-metered-broadban/.

example, Sanford Bernstein analyst Craig Moffett published a brief stating that if ISPs are not allowed to block applications, then usage-based pricing is their "only viable option."[102]

These assertions are simply untrue. By stirring up fears of higher monthly bills, this posturing attempts to de-legitimize the Commission's worthy action, giving consumers the false impression that they must choose between secret Internet blocking or the very undesirable practice of metering. This is a false choice, one that is economically unnecessary and impractical.

The term being bandied about in this debate is "metering." But no U.S. broadband provider is considering actual metering (i.e., charging by the byte). What is actually being floated is "limitation pricing," or "Internet overcharging," whereby users would face additional charges after they reach a certain usage limit or cap. Such bandwidth caps are nothing new -- carriers have had caps in place for years, even though they advertise their services as "unlimited." What is new is speculation that providers will now charge fees for exceeding these caps in order to manage possible network congestion.

The shift to limitation pricing would represent a major change in Internet pricing models. But to believe such a move is right around the corner and will be brought about because of congestion, we must first accept the argument that there is widespread congestion in the network that cannot be managed using reasonable network management or by making routine investments. The congestion could be in the last mile (in both directions or just a single direction), in the transport segment (from the ISP to the backbone), or in some combination of these. And congestion could impact certain carriers more than others; for example, cable ISPs might have more congestion issues, particularly on the upload side, given the design of their last-mile networks. But as discussed above, to date, no ISP has made the case that congestion exists or is widespread, or that Internet overcharging would do anything to remedy this supposed problem.

Even if we accept the premise that there is last-mile congestion, that in no way means that Internet overcharging is the "only viable" alternative to outright blocking or other discriminatory unreasonable network management practices. Neither does it mean that limitation pricing is the correct response from a economic efficiency standpoint.

Comcast claimed that it needed to block BitTorrent to deal with "bandwidth hogs" -- customers the cable company claims were causing network congestion by transferring large amounts of data. But the FCC found that Comcast targeted one specific application on a network-wide basis, at all times of the day and night, regardless of whether an individual fit the profile of a high-bandwidth user. The FCC rightly ruled that application blocking is not a reasonable way to manage congestion.

However, even if we assume "bandwidth hogs" are really causing congestion -- meaning the "traffic jams" are neighborhood -- and time-of-day specific -- Internet overcharging is still a poor solution that carriers are unlikely to use. It is simply too broad, too cumbersome and ineffectual in comparison with other methods.

There are a host of better options to limitation pricing for both the customer and the ISP. If the problem is truly caused by a few "bandwidth hogs," then direct contact with those customers may be all that is needed to modify their behavior. Indeed, before it started aggressively blocking applications, this was Comcast's stated practice. Or an ISP could just use a protocol agnostic, narrowly targeted reasonable network management technique, as Comcast has now adopted. Comcast's new user-specific, time-limited, congestion-triggered management approach is preferable to Internet

[102] *See* Poletti *Ibid.*

overcharging, because it has a much more tangible impact on congestion during peak usage times. It only impacts those who exceed the cap in a short time window, and it narrowly modifies the behavior of those few users that may be causing the congestion. Most importantly, it does not select winners and losers on the Internet by targeting specific applications.

Compared to Internet overcharging, user-specific, time-limited, congestion-triggered throttling also makes better financial sense for ISPs. Internet overcharging (especially with low caps) will modify the behavior of almost all users. With everyone watching the meter, this pricing model will inevitably lead even casual users to spend less time online or to avoid the applications that use higher amounts of bandwidth -- the very applications that are responsible for the increases in the perceived value of broadband access by consumers. This pattern of changing behavior will inevitably cause the marginal customer to question the need for the connection in the first place, leading to a possible slowdown in the growth of new customers for ISPs. Furthermore, ISPs that don't have the same congestion concerns will be able to differentiate their products by offering services free of limits and penalties. Together, these likely scenarios create a strong incentive for ISPs to avoid Internet overcharging pricing schemes. Of course, if the high-speed Internet access market had more than two competitors, these incentives would be even stronger.

As regulators, the Commission should be concerned if telecommunications providers who possess market power are not efficiently pricing their services. That is, what pricing practice would you expect in a competitive marketplace? What pricing practice would maximize consumer and producer surplus?

In the networking business, there are two types of costs that carriers need to recover: fixed (or sunk) costs and variable (or ongoing) costs. For the sake of argument, let's imagine a fictitious ISP, "ISP-X", who is a medium-sized fiber-to-the-home company. Consider one customer, "Customer A" of ISP-X who is an average Internet user, but who recently has taken to watching HD Hulu streams each night at 8pm. Let's assume Customer A consumes 5GB per month. Let's also assume they live next door to a heavy user, who consumes 300GB per month.

ISP-X would have incurred large upfront costs from laying fiber optic cable from their central office to all the houses in Customer A's neighborhood. The fixed cost of laying that cable to Customer A's house is the same as laying that cable to Customer A's next-door neighbor's house. The fact that the neighbor is a heavy user doesn't matter. So in an efficient market, ISP-X would recover their fixed costs from our customers via a monthly use charge.

ISP-X also needs to recover its ongoing costs. These costs include network opex and transit and transport costs. Network opex does not vary based on how heavy an individual user is utilizing their connection; and the FCC has estimated these costs to be relatively low (around $4 per month per served customer).[103] Transit and transport *might* vary based on how heavy an individual user is utilizing their connection (see below), but these costs are also estimated by the FCC to be very low (approximately 50 cents per month per customer in urban areas). Thus we should for the moment focus on transit costs, as they may vary based on heavy usage.

Let's assume ISP-X's fixed deployment costs are $1000. Based on the FCC's estimates noted above (which show typical wireline ISP annual ongoing costs per customer are $35 in capex, $50 in

[103] *See* "FCC Broadband Plan Halftime Presentation," Presented at the September 29th 2009 Open Commission Meeting, at slide 44.

network opex, and $6 in transit),[104] if the life cycle of the capital equipment is 7 years, ISP-X would need to recover $12 per home per month in fixed costs, and $8 in ongoing costs. Thus, roughly, ISP-X could make a 20 percent profit by earning $25 per month per user (Note this is incredibly conservative, because the fiber-to-the-home line is going to be used to offer phone and TV in addition to Internet. Carriers offering triple play have average per user revenues exceeding $100 per month).

These ongoing costs include the costs ISP-X would incur transporting bandwidth to and from its customers to the Internet backbone. Here is where the argument for Internet overcharging falls apart.

In an efficient market, ISP-X would recover its bandwidth costs from our customers in the same manner that we incur them. Like most ISPs of its size, it would likely connect its local central office facilities to the Internet backbone via leased high-capacity lines. For the sake of argument, lets assume that when ISP-X first deployed to Customer A's neighborhood, an OC-12 fiber optic line (622Mbps) was of sufficient enough capacity to ensure all our customers receive their advertised speeds during peak evening times. Let's also assume that ISP-X is a smaller company, and does not own that OC-12 line, but leases it from the local phone company, Verizon. ISP-X would pay the same amount for that leased line *regardless* of whether it is filled 24/7 at 90 percent capacity, or whether it only comes close to that during evening use times. In other words, ISP's don't pay by the Byte to carry thier customer's traffic. Thus, the efficient and equitable way to recover ongoing bandwidth charges is for ISPs to assess their customers a portion of those costs via their monthly bill. ISP-X is not metered, so they have no economic reason to meter our customers.

Now lets assume that over time, ISP-Xs customer's average bandwidth use grows. As it does, the OC-12 line they leased to carry their traffic back and forth to the Internet backbone becomes pretty full, consistently hitting above 95th percent capacity during peak use times. So it's time for ISP-X to upgrade its transport capacity. Let's assume ISP-X determines that an OC-48 line (2.5Gbps) is the best way to go. In all likelihood, they'd probably make the decision to build that line themselves, and thus would incur substantial fixed costs -- fixed costs that are most efficiently passed back to its customers in their fixed monthly bill. But for the sake of argument let's assume they do not build this line, but lease the OC-48 line from Verizon. This higher capacity transport line will certainly cost ISP-X much more each month, but it will be substantially lower on a dollars-per Mbps basis.

How then should ISP-X recover this extra monthly charge? Given that the need to move to this higher capacity line is being driven in part by heavy users like your neighbor, shouldn't they be "fair" and charge him more. Well, perhaps. But doing that by the Byte isn't the economically efficient way to do it, because again, ISP-X does not pay by the Byte -- they pay a flat monthly fee for a bigger pipe. So the way ISP-X can recover this additional ongoing cost in an efficient and fair manner is by offering different service packages that appeal to the different kinds of users. Let's assume ISP-X used to offer 5Mbps, 10Mbps and 15Mbps downstream packages for $20, $25 and $30 respectively. Now that they have to upgrade to an OC-48 backhaul line, they have much larger overhead. So now they will offer 5Mbps, 10Mbps, 15Mbps, 30Mbps and 100Mbps downstream packages for $20, $25, $30, $50, and $100 respectively. By making these offerings, it is very likely the heavy users will flock to the higher-speed/higher-priced tiers. This is because there is a strong correlation between heavy users and willingness to pay for faster speeds.

[104] We call this "ongoing", because the FCC's estimates for urban areas appear to be precisely that; they don't include prior buildout capex, just ongoing capex and network opex and transit. This amounts to $91 per year, which is in line with the general rule of thumb that ongoing network costs tend to be about 10 percent of initial fixed costs on an annual basis.

Overtime, ISP-X's own bandwidth costs will decline (presuming the leased access rates decline), and they will be able offer our customers faster speeds for the same or lower price. In all likelihood, the life cycle of ISP-X's FTTH network will be much longer than its planned 7 year depreciation schedule, so they will have the extra funds to make additional capital upgrades. Because they, being rational market actors, will want to grow their business, ISP-X will likely eventually build its own transport lines, laying down 40-gigabit Ethernet (OC-768, 40Gbps) lines, and thus be able to offer its customers very fast speeds, for fair monthly prices.

Now, let's explore an alternative scenario and assume that ISP-X just couldn't justify the upgrade from its OC-12 to an OC-48 line. But let's also assume ISP-X did have a real congestion issue during peak-use times. While it would be tempting to charge by the Byte, out of the need to go after the heavy users, what purpose would this serve?

If the Internet overcharging was for the purpose of discouraging Customer A's heavy use neighbor from being a heavy user, there's no reason to believe ISP-X could set the price and limits at the right level that would discourage that heavy user, but not discourage other marginal customers from dropping our service altogether. If this Internet overcharging billing system brought ISP-X extra revenues, they could then upgrade to that OC-48 line, but this would not be a fair way of doing it. Why? Well aside from the fact that ISP-X is itself not metered, during peak usage times Customer A's use of HD Hulu contributes just as much to the congestion problem as their 300GB per-month-using neighbor does. In fact, it could very well be that Customer A's heavy use neighbor consumes most of their data overnight, when the network is mostly idle.

This last point is important. ISP-X could just contact the heavy use customer directly, and encourage that customer to shift some of their heavy usage to off-peak times. Or if ISP-X had a legitimate congestion issue, and they refused to upgrade to a higher capacity backhaul line (which, as discussed above, could actually make them more money in the long run because they could offer higher-priced faster tiers), as a last resort ISP-X could use protocol-agnostic network management techniques that are triggered only during peak usage times, and only target the heaviest users.

Thus, in summary: 1) Usage-based billing is not fair or efficient, because carriers themselves don't pay for transport by the Byte -- they pay by the size of the dedicated line leased to transport data; 2) Usage-based billing is not a fair way to recover the costs of network upgrades, because the cost of upgrades are fixed-costs, and are efficiently recovered via fixed monthly charges; 3) Usage-based billing is not a fair way to price congestion, because it has no relation to the cause of congestion; 4) Usage-based billing is not the right way to deal with the additional "costs" imposed by "super-users." If these congestion costs are negative congestion externalities (which is a sign the ISP might have oversold their capacity), they are not controlled very well with usage-based pricing. If these congestion costs are the costs incurred from upgrades to a higher monthly priced leased backhaul line, these costs are better recovered via the offering of higher speed/higher prices tiers.

If some ISPs do make the shift to Internet overcharging, it won't be because of pressures from Network Neutrality rules. It will simply be because they possess market power and will have chosen to abuse that market power in order to earn supra-competitive profits. It is paramount that the Commission recognize and understand cause-and-effect, not take carriers at their word as to what underlies their motives to gouge their customers.

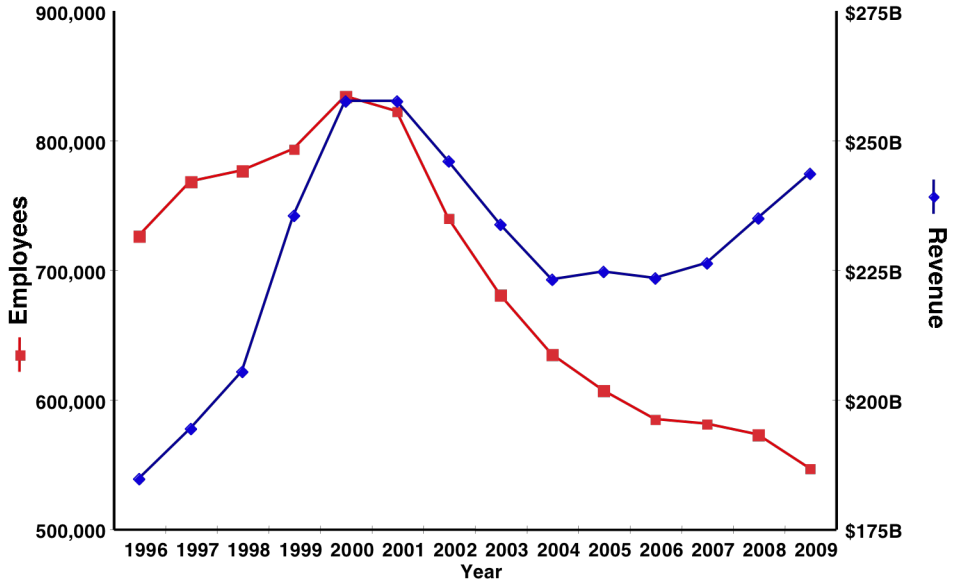
Network Neutrality Will Impart No Harm on ISP Employment

Some opponents of Network Neutrality charge that this light-touch regulatory regime will somehow result in ISPs reducing their work force.[105] The reasoning behind this argument, say these opponents, is that Net Neutrality will reduce ISP investments, causing them to hire less and fire more. This assertion is plainly unsupported by the facts, and actually contradicts what unfortunately has become the ISP industry's default behavior -- as revenues rise, jobs are cut.

As we illustrated above, 1) ISPs are unlikely to pursue the pay-for-play discriminatory model, as that could result in prime content being withheld from their networks; 2) The pay-for-priority model is unlikely to bring in substantial revenues, and those revenues would only be possible in a state of perpetual network congestion; and 3) The vertical-priority model is likely to be pursued, but this model is based on an ISPs desire to protect legacy business lines from competition, which will further reduce their otherwise natural inclination to make network investments. Thus, the net neutrality-hurts-jobs argument is nothing but a baseless scare tactic.

Proponents of the net neutrality-harms-jobs rhetoric claim that violating net neutrality will create new revenue streams for ISPs, who will then in turn hire more and invest more. But we need not rely on theory to see what the likely outcome of higher revenues. As we demonstrate above, ISP industry revenues have been consistently increasing, yet investment is flat or declining. The same is true for employment, in an even more dramatic fashion.

Figure 6: Telco Employment vs. Revenues
(Data Includes All ILEC + CLEC Business Segments For AT&T, Verizon & Qwest)



Source: SEC filings; For this chart, All of the prior businesses that comprise AT&T, Qwest and Verizon were included, in order to ensure comparability across all periods (i.e. the pre-merger data is pro forma, reflecting all pre-merger CLEC businesses).

As we see in Figure 6, during the era of competition (1996-2002), the revenues of the BOCs (and their then CLEC units) rose along with employment levels. As the tech bubble burst and 2001

[105] *See* Alex Chasick, "AT&T Asks Employees To Oppose Net Neutrality," *The Consumerist*, Oct. 20, 2009. (Quoting AT&T Chief Lobbyist Jim Cicconi as stating, "Let your voice be heard: Internet regulation is bad for consumers, jobs, investment and universal broadband").

economic recession set in (along side the new era of deregulation and consolidation), revenues decline from a high of near $260 billion in 2001, to a low of $223 billion in 2004. Beyond this point, telco revenues rebounded sharply, rising to an estimated $243 billion for 2009, or where they were prior to the bubble-years of 2000-2001. But while telco revenues are on the rise, employment levels in the pro-consolidation era have continued to fall precipitously. AT&T, Qwest and Verizon collectively employ less than 550,000 full-time workers, and that figure is expected to drop even further in 2010. Revenues are up about 10 percent from the bottom, while jobs are down 14 percent since the revenues began to recover. From 1996 through 2009 revenues for the industry are up 32 percent while jobs have dropped 25 percent. In short, the pro-competition era created jobs, and the pro-consolidation era destroyed them.

In summary, there is no reason, either theoretical or practical, to assume any connection between ISP hiring practices and the phantom revenues they might earn in a world without network neutrality. ISPs have shown that their top priorities are reducing capex, increasing revenues, and getting rid of jobs at every turn. Some of the leading opponents of network neutrality have in the past made promises about creating jobs if allowed to merge; these promises were not surprisingly broken. Frankly, the ISPs have little credibility on this issue. While we support and deeply respect the views of the labor unions that are doing everything they can to preserve good jobs for good people, we do not see any plausible reason why network neutrality will reduce ISP employment. In fact, with network neutrality, content innovation will prosper, furthering demand for high-capacity, ubiquitous Internet access, which in turn will stimulate ISP investment. Without network neutrality, ISPs will be incentivized to reduce network investments, in order to make congestion the norm. This is not a recipe for job creation.

Network Neutrality Will Not Widen the Racial/Ethnic Digital Divide, and Allowing ISPs to Operate Discriminatory Networks Will Not Result in a Narrowing of this Digital Divide

During the debate surrounding the issue Network Neutrality very significant questions have emerged about how this policy (or lack thereof) will impact communities of color. While there are undeniably a variety of opinions on the Net Neutrality question, history teaches that issues of access to information and communications media should be of paramount concern to all civil rights groups. The Internet offers the potential to break from the discrimination inherent to traditional media systems that granted total control over content to the owners of newspapers, broadcast stations, and cable TV systems. Unlike print, broadcasting, and cable, the Internet has to this point had no owner with the power to favor particular kinds of speech over others for commercial or political ends. The networks that carry that Internet's data do not care who sent it, where it is going, or what it says. That spirit of egalitarianism has made it a transformative tool for speech, culture, and commerce in a completely free marketplace of ideas, goods and services.

And while it at first may seem counterintuitive that some civil rights groups might oppose Net Neutrality -- a rule barring discrimination -- their concerns *without a doubt* deserve a fair hearing. The idea of nondiscrimination in the media system is virtually beyond dispute, but the technocratic details of how that idea is best made reality are contentious. They involve fairly complex matters of economics and technology that require clear-eyed scrutiny.

Below, we investigate the four main claims made about why network neutrality would be bad for communities of color. While these claims may be intuitive on the surface, they do not withstand the rigorous application of logical, historical, and economic analysis. When weighed against the benefits of rules requiring nondiscrimination on 21st century information networks, they are not persuasive. The opportunity to reverse the discrimination baked into traditional media systems sets a very high bar that none of the counter-arguments come close to clearing.

The first claim made in opposition to net neutrality from a civil rights perspective is essentially the same investment argument we've thoroughly addressed above: that incumbent phone and cable Internet Service Providers (ISPs) need to violate Network Neutrality in order to create new revenue streams. The civil rights twist on this argument is that once the new money comes in, ISPs will use it to build out broadband services to underserved communities of color.

This claim is composed of two parts -- first, that the ISPs will earn lots of new revenue by creating business models that discriminate between different kinds of Internet content; and second, that these new profits will be plowed into building infrastructure to underserved communities. While there is ample reason to doubt the actual revenue potential of the hypothetical discriminatory business models envisioned by leading broadband ISPs (as exhaustively explored above), even if we assume that violating net neutrality will be a revenue boon for the ISPs, there is ample historical evidence and logical analysis that suggest that build-out to marginalized communities will not improve if we abandon Net Neutrality.

First, as stated above, without the obligations to operate a non-discriminatory network, ISPs will have a strong incentive to actually reduce network investment. This is because the value of prioritized delivery is only high when network congestion is the norm. If the network is expansive and has little congestion, there is no business model to sell privileged access to scarce bandwidth. Buildout reduces congestion, and would undermine the revenue generating potential of these new discriminatory business models.

Second, history shows that an ISP's geographic deployment decisions are motivated largely by perceptions about the revenue generating potential of an area. ISPs have for years avoided next-generation deployments in low-income communities, primarily because they feel that customers in affluent suburbs are more likely to subscribe to premium services, increasing the so-called "ARPU" (average revenue per user). Without Net Neutrality standing in their way, ISPs will certainly experiment with new discriminatory products and services -- services aimed at affluent users with the resources to pay more for new things. These new lines of business will enable ISPs to avoid what they fear most -- a price war on their basic connectivity services. Thus, there is no reason at all to expect that these ISPs would shift their next-generation deployment focus to areas they have always ignored, when they are unleashed to extract more revenues from content producers and affluent consumers. The same economic logic that keeps ISPs from focusing investment on low-income neighborhoods will apply irrespective of how much their profits may grow from violations of Net Neutrality. Also, it should be noted that "deployment" here must be qualified. Outside of remote rural areas, deployment of current generation high-speed Internet technologies by phone and cable companies is nearly universal. And cable companies, as discussed above, will incur relatively little cost making the upgrades to next-generation cable modem services; indeed, their deployment plans are largely fixed and will be almost universal by 2015, and network neutrality will not impact those plans one bit.

Third, the major phone and cable companies are currently earning record profits, and have unprecedented free cash on hand. Yet despite being flush with cash, the incumbents have not lifted a finger to remedy their past failure to adequately deploy broadband services to marginalized communities, or more importantly, to make these services affordable. Indeed, as discussed above, the overall relative investment levels (defined as capital expenditures as a percentage of revenues) made by incumbent ISPs have declined despite soaring profits. Given this well understood reality, is there any reason to believe that allowing ISPs to operate discriminatory networks will somehow cause them to reverse their legacy of discriminatory deployment? The promise that deregulation will lead to better service for low-income areas is as empty in this case as it has always been.

If incumbent phone and cable ISPs are allowed to operate discriminatory networks, they are likely to reduce deployment, delay network upgrades, and continue to focus their businesses on affluent consumer segments. Any additional revenues generated from new discriminatory business models will just be used to increase market valuation and shareholder dividends.

The second claim made in opposition to net neutrality from a civil rights perspective is that incumbent phone and cable ISPs are a major source of jobs for people of color, and that without the ability to violate Network Neutrality, ISPs will have reduced incentives to invest, and will hire fewer people of color to build and operate broadband networks. This claim is also without merit. Above, we outlined how there is very little relationship between Network Neutrality and an ISP's network investment incentives. With the ability to discriminate, ISPs are given a very large incentive to reduce network investments in order to reap profits from congestion created by artificial scarcity. Thus, there is every reason to expect investment to decline without network neutrality. On the flip side, economic theory suggests that the application of Net Neutrality rules—a very light regulatory protection applied industry wide—is not likely to deter network investment, which is driven more by competition and changing technology.

Further, recent history suggests that incumbent phone and cable companies are prone to reducing their workforce, regardless of their own economic well-being. Major ISPs have been laying-off thousands of workers despite the fact that they are earning record profits, and also despite the fact that there is palatable demand for next generation networks -- networks that require human capital to build and operate.

Furthermore, the Internet economy is about much more than the Internet access networks themselves. The overall U.S. information and communication technologies (ICT) sector is responsible for 30 percent of real GDP growth, and the overwhelming majority of this activity takes place not in more narrow telecommunications services sub-sector, but the applications, content and software sub-sectors. In other words, there is more economic activity in the broad universe of businesses that sell goods and services on the Internet or to use with the Internet than there are in the network companies themselves. Investment in the applications and content sub-sectors will be substantially and negatively impacted by the abandonment of Net Neutrality, and as a result, overall growth in the U.S. economy will suffer. This will certainly have a long-term negative impact on jobs, much greater than the (unlikely) promised increases in hiring by the phone and cable companies.

Therefore, with the ability to operate discriminatory networks, ISPs will reduce investment in order to profit from artificial scarcity. And recent experience suggests that even if the incumbents are flush with cash, that they will still take every opportunity to reduce their overheads by consolidating and firing workers whenever possible. We should all be concerned about the impact on the larger economy that will be felt by the transformation of the Internet from an open platform for commerce, to a closed network where the current market leaders are able to lock-in their status and forestall future innovation and competition.

The third claim made in opposition to net neutrality from a civil rights perspective is rooted in the well-founded belief that price is a key barrier to adoption of broadband services by people of color. ISPs argue Network Neutrality rules will raise the costs of building and operating broadband Internet access networks, and these costs will be passed onto consumers, keeping people of color on the wrong side of the digital divide. Somewhat contradictorily, ISPs also argue that without the additional revenues from the new paid-prioritization business models, that in order to grow margins, ISPs will raise consumer prices, thus keeping the price barrier to adoption in place.

This argument seems intuitive, but is not supported by everything we know about how the ISP industry actually functions. The corollary to this claim is that with the ability to violate Network Neutrality and the revenues that brings, phone and cable companies will offer lower priced services that will increase adoption among those who view price as a barrier to adoption. But this hypothesis just doesn't hold water. Major phone and cable companies are earning record profits, yet prices are not falling. According to FCC and other data, in urban areas the major ISPs' costs of providing high-speed Internet access services are so low that these companies earn contribution profit margins well above 80 percent.[106] These costs continue to decline, yet the retail price of broadband services is on the rise.[107]

It is important to put this data into perspective. Cable modem companies who have already deployed to over 92 percent of U.S. homes only incur $7 per month in costs to sign up a new customer. This means, if they were really serious about impacting the digital divide, they could offer targeted introductory broadband service in low-income ZIP codes, charging as little as $10 per month, and still reap a profit margin above 40 percent! Yet the industry has not pursued this path.

If the ISPs have refused to lower their prices in a market of declining costs and record profits, why should we expect them to do so if they are given the ability to violate Net Neutrality? In short, we should not, and the reason lies primarily in how these companies view their own pricing practices. Leading ISPs and the investors that back them view "price wars" as disastrous to their industry.[108] They feel that if they begin offering more affordable service packages aimed at low-income users, that this will "devalue" their services as a whole. That is, the offering of a low-priced option diminishes an ISP's ability to earn high margins off selling services to those who place a higher value on the service, because the low-price offerings cause these consumers to reduce their valuation. Major ISPs have flatly stated that they refuse to compete on price.[109] There is no economic reason to expect this will change in the absence of Network Neutrality rules.

Further evidence of this industry behavior is demonstrated by how wireless voice providers have created and treated the pre-paid vs. post-paid service market. For many years, the major cellular companies, AT&T and Verizon, mostly ignored the potential of the less affluent customer segments, which lead to companies like Sprint and Tracfone to aggressively pursue the pre-paid business line. Yet despite the palatable demand for cellular services among less affluent market segments and the success of the pre-paid providers, the major operators still treat this segment as less than desirable, and focus their attention on the more profitable business and smartphone segments.

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[106] *See, e.g.,* Vishesh Kumar, "When Is The Cable 'Buy' Set to Come?," *Wall Street Journal*, April 3, 2008, which reported "Comcast, for instance, has a profit margin of 55% in video but 70% in phone and 80% for broadband, estimates [Sanford Bernstein analyst Craig Moffett]." It should be noted these values appear to be contribution margins, which consider the profit from adding incremental customers. There is other data to suggest that overall profit margins are also very high for the ISP segment of communication firms businesses. The FCC's National Broadband Task Force recently reported data that showed for the typical ISP network in an urban area, the total capital expenditure, operating expenditure, and transport cost amount to $91 per customer per year. Assuming an annual ISP-product ARPU of $40, this amounts to a total profit margin of 80 percent. *See also* "Presentation of National Broadband Plan Team: September Commission Meeting, 141 Days Until Plan is Due," September 29, 2009, slide 44.

[107] *See* John Horrigan, "Home Broadband Adoption 2009," Pew Internet & American Life Project, June 2009.

[108] *See e.g.* Karl Bode, "Craig Moffett: Wireless Industry 'Collapsing'," DSLReports.com, March 6, 2009.

[109] *See e.g.* Karl Bode, "Verizon Stops Seriously Competing On Price," DSLReports.com, June 23, 2009. (Quoting a Verizon representative as stating, "You will not see us advertising prices any more. You will see more about what the experience can be.")

A final variant of this "net neutrality raises prices" claim was offered by an AT&T-funded think tank, which published a paper[110] claiming that Network Neutrality would prevent ISPs from managing congestion, and thus they would be "forced" to make investments in their network, and that the cost of these investments would be passed back onto consumers in the form of higher prices. (Notably, this claim completely contradicts the ISP's other argument that they wouldn't invest unless the FCC abandons Net Neutrality.) This argument however does not acknowledge basic legal facts in the regulatory process, because Network Neutrality rules as proposed in the instant proceeding *will* allow for reasonable network management. Comcast --whose application-blocking network management technique was found to be in violation of the FCC's existing Internet Policy Statement -- changed to an application-agnostic congestion management technique that is perfectly acceptable, and this change was made without having to purchase new equipment or incur new costs. In short, nothing in the FCC's proposed rules will prevent ISPs from managing congestion -- they'll just be required to do so in a non-discriminatory manner, or in a manner than complies with reasonable network management standards.

But this "discrimination leads to lower prices" argument is also questionable. It ignores the underlying financial fundamentals of the high-speed Internet Access service business. Right now, ISPs are making so much money, and their costs are declining so rapidly, that they could invest in next-generation networks *and* lower their prices and still remain one of the most profitable sectors of our economy. But as stated before, ISPs are much more concerned with reducing capital expenditures, laying off workers, and increasing already healthy profits. Following their economic incentives, they will continue to ignore the needs of the low-income and other marginalized communities, and will look for every opportunity to raise prices, regardless of what their underlying costs actually are.

In short, the incumbent phone and cable ISPs have a long record of avoiding marketing their services at market segments they view as "less desirable," and an even longer record of increasing prices even as their own costs decline and profits rise. With the ability to violate Net Neutrality, ISPs will simply continue this pattern, and will more likely devote more efforts to roll out new "premium" services aimed at affluent consumers. Major ISPs have flatly stated that they have no plans to compete on price, and view such behavior as harmful to their bottom line.

Network neutrality is not a barrier to closing the digital divide – it is central to providing the benefits of an open Internet to all Americans. Under no circumstances should we trade away the values of an open Internet in a devil's bargain for vapid promises of low-cost service in historically underserved areas. Low-income communities deserve the free and open Internet as much as any other community. The economic conditions that have excluded these communities in the past will be there no matter the outcome of the Net Neutrality debate. At the end of the day Net Neutrality isn't the answer to every technology problem in America, but it is an important policy that will ensure that communities of color are able to bypass the gatekeepers of the traditional closed media system. Contrary to ISPs claims, if they are given the right to profit from discrimination they are unlikely to hire more people of color, unlikely to reverse their past behaviors of redlining "less desirable" market segments, and unlikely to lower prices to reach less affluent consumers.

[110] *See* Gorge Ford, et. al., "Expanding the Digital Divide: Network Management Regulations and the Size of Providers," Phoenix Center Policy Bulletin No. 23, October 2009.

PART II: CRAFTING THE BEST POLICY REGIME TO PROTECT THE OPEN INTERNET

Having provided clear and compelling evidence for the need and benefits of open Internet policy, we now turn to discussion of how the Commission should craft those policies.

The Commission should establish a clear rule against all discriminatory behavior, subject to reasonable network management. The Commission must not permit bias against disfavored communications, turning the general purpose Internet into a special purpose network, engineered to support majority uses as of 2009 and to disfavor innovation and diverse voices. The Commission must not dilute the substance and destroy the practical effectiveness of a nondiscrimination rule through loopholes and qualifiers. The Commission must not create categorical exceptions for network management practices that can be harmful to consumers, competition, or innovation. Anything less than a strict nondiscrimination rule would undermine the environment of innovation without permission that lies at the heart of the Internet and is central to its social and economic value.

A Clear, Unambiguous Rule Against All Discrimination is Essential to Protect Consumers and Competition From Harmful Behavior.

The Commission must adopt a clear, direct rule prohibiting all discriminatory activity to protect consumers and to eliminate ambiguity for providers of Internet access service. In the *Notice*, the Commission offers such a rule: "Subject to reasonable network management, a provider of broadband Internet access service must treat lawful content, applications, and services in a nondiscriminatory manner."[111] If the concepts of "reasonable network management" and "nondiscriminatory manner" are defined properly, the proposed rule language will protect consumers, competitors, and innovators from harmful behavior, while allowing flexibility for network operators to engage in behavior that may violate the rule yet do so in service of public interest purposes, without undermining the essential public interest protections.

Any rule ultimately issued in this proceeding should be characterized by the Commission as prohibiting *any* deliberate packet or flow degradation or prioritization -- subject to reasonable network management through a subsequently defined standard. Although "pay for priority" treatment is one notable component of discriminatory behavior, as identified by the Commission,[112] the open Internet can be substantially harmed through unpaid degradations and prioritizations as well. Any definition of "nondiscriminatory manner" which is narrowly defined to include only paid discrimination would fail to capture these harms. No categories of discriminatory behavior should be exempted from the rules, including in particular any form of "application bias" that places applications in network operator-determined categories of priority, whether such categorization is by typical use or in service of a more anticompetitive purpose.[113] *Any discrimination slows or blocks some traffic*, and neither the level of harm imposed by the discrimination nor the need to engage in such harmful activity can be categorically predetermined for all fact patterns -- as a result, the Commission should clarify that *any* discrimination, no matter how trivial or potentially beneficial, should be evaluated through a framework of reasonable network management, and not categorically or automatically permitted or exempted.

At the outset, as proposed by the Commission[114] and as elaborated in this paper, there should be little or no near-term costs to providers or consumers of Internet access services, as widespread

[111] *Notice* at para. 104.

[112] *Ibid*. at para. 106.

[113] *See infra*, Section III. B. vi.

[114] *Ibid*. at para. 111.

discrimination against traffic is not commonplace in the United States.[115] As discussed above (and expanded upon below in the subsequent discussion of reasonable network management), potential long-term "costs" of the proposed rule, as alleged by its detractors, either are based on imagined rules that substantially exceed the Commission's proposal, or are alleviated by a proper framework of reasonable network management applied *post hoc* through a rigorous complaint process.[116]

The costs of the proposed rule are negligible, but the benefits are substantial. The proposed rule will help to preserve all that is valuable in the open Internet, including speech and political interests of Internet users[117] as well as the ability of the Internet to facilitate community interaction and even democracy.[118] Speech, communications, and commerce would be protected in all of their forms, whether in large scale cultural movements or long tail diverse and disparate voices.

The proposed nondiscrimination rule offers numerous economic benefits as well. A clear prohibition on discriminatory short-cuts around investment will create an environment that maximizes the effectiveness of whatever level of competition exists in the present market or in future markets.[119] Facing restrictions on schemes to manage scarcity to create artificial additional revenue, providers will instead invest in robust networks to compete and to grow, increasing the utility and value of the network as a whole for end users, developers, and the providers themselves. Innovators and the investors who support them can have confidence that their products will not be stifled by the activities of the network operators (often their competitors, through vertical integration of content, applications, and services) who control end-user Internet access service,[120] and investors in innovative products can know that the success or failure of their investments lies in the hands of the developers themselves, and not gatekeepers poised to stand in the way.[121]

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[115] However, the technology to engage in widespread discrimination is now readily available. *See* Chris Riley and Ben Scott, "Deep Packet Inspection: The End of the Internet as We Know It?" (March 2009), *at* http://www.freepress.net/files/Deep_Packet_Inspection_The_End_of_the_ Internet_As_We_Know_It.pdf. One cable company, Cox, conducted a trial of discriminatory practices. *See ibid.* at p. 6-8. Cox completed its trial in late 2009. *See* "Congestion Management FAQs," Cox Communications, *at* http://www.cox.com/policy/congestionmanagement/.

[116] *See infra*, Section II [Reasonable Network Management]. One of the most common "costs" associated with open Internet rules is harm to "flexibility" needed by network operators to engage in network management. *See, e.g.*, Comments of AT&T, WC Docket No. 07-52 (Feb. 13, 2008), at 3-4. A framework to permit reasonable network management, coupled with a post-hoc complaint process to identify within the context of a specific case whether a network practice should be deemed "reasonable," can adequately provide flexibility, without permitting harmful anti-competitive behavior.

[117] *See Notice* at para. 75.

[118] *See ibid*. at paras. 76-77.

[119] *See, e.g.* Inimai M. Chettiar and J. Scott Holladay, "Free to Invest: The Economic Benefits of Preserving Net Neutrality," Institute for Policy Integrity, New York University School of Law, Report No. 4 (January 2010), *at* http://www.policyintegrity.org/documents/Free_to_Invest.pdf; S. Derek Turner, "Finding the Bottom Line: The Truth About Network Neutrality & Investment" (October 2009), *at* http://www.freepress.net/files/Finding_the_Bottom_Line_The_Truth_About_ NN_and_Investment_0.pdf; Barbara van Schewick, "Towards an Economic Framework for Network Neutrality Regulation," *Journal on Telecommunications and High Technology Law*, vol. 5, p. 329 (2007).

[120] *See* "Letter to FCC Chairman Genachowski Supporting Open Internet Rules," Docket No. 07-52 (Oct. 19, 2009), *available at* http://www.openinternetcoalition.org/index.cfm?objectID=69276766-1D09-317F-BBF53036A246B403 (letter signed by 27 executives and innovators from Internet and technology companies); *see also Notice*, para. 63.

[121] *See* "Letter from Technology Investors to FCC Chairman Genachowski Supporting Open Internet Rules," Docket No. 07-52 (Oct. 21, 2009), *available at* http://www.openinternetcoalition.org/index.cfm?objectID=74D41E0E-1D09-317F-BB757BF9F7D69F98 (letter signed by 30 business investors in technology companies).

A Clear Reasonable Network Management Standard Permits Good Behavior Without Creating Arbitrary Loopholes.

A clear rule against discriminatory behavior, with an exception for behavior which is determined to be "reasonable network management," strikes the proper balance of clarity and flexibility, without creating the loopholes. Although the Commission's proposed definition of the concept of "reasonable network management" raises concern,[122] the overall framework proposed by the Commission is valid: The Commission has proposed a clear and comprehensive rule against discriminatory behavior,[123] with a flexible reasonable network management standard that will account for future developments in technology at both the ends and in the middle of the network.[124] A clear rule on discrimination, with an exception for reasonable network management, places the burden of proof properly on the network operator to demonstrate the merits of the network management techniques, rather than to evaluate any potential impact of the discrimination, which would likely discount against the potential value of future innovation.

The primary alternative to the proposed framework, as the Commission notes, would be to use a flexible definition of the concept of "discriminatory behavior," such as prohibiting only "unreasonable discrimination," without including an exception for reasonable network management.[125] The Commission asserts that there may be little substantive distinction between the two approaches, and that many techniques and contexts found to be acceptable under one, would also be acceptable under the other.[126] Although some techniques might indeed pass both such standards, many other behaviors would likely be improperly upheld under a rule on "unreasonable discrimination." In particular, a rule prohibiting only "unreasonable discrimination" could create a loophole permitting discrimination that is harmful to potential innovation, as it may be difficult or impossible to determine whether and when potential future harm is enough to constitute "unreasonable" discrimination. At the very least, such a rule would create greater uncertainty and would be harder to enforce in such circumstances.[127] The Commission's rules should recognize that discriminatory acts are *always* harmful to *some* traffic, because they slow or block some Internet packets or flows as compared to normal Internet routing, and that, regardless of the current level of harm this creates, the potential unintended consequences of the harm for innovation are substantial. The Commission should thus examine whether, in context, the discriminatory act is reasonable because it serves a valuable purpose in an appropriate manner. Such a framework would not place burden on the innovator to predict the future harm of the discrimination; instead, it would offer clarity and protection for Internet users and developers who would not find their communications discriminated against, absent an overriding public interest benefit.

A Standard of Unjust and Unreasonable Discrimination Would Not Suffice for Internet Access Service.

In addition to these procedural obstacles, the standard of "unjust and unreasonable discrimination" of Section 202(a) of Title II is neither substantively nor procedurally appropriate for Internet access service, for several reasons.[128] Many opponents of open Internet rules seek to weaken

[122] *See infra*, Section II [Reasonable Network Management].

[123] *Notice* at para. 104.

[124] *Notice* at paras. 133-34.

[125] *Notice* at paras. 109-10.

[126] *Ibid*.

[127] *Notice* at para. 114 ("Would a prohibition on unreasonable discrimination, standing alone, be less certain, harder to enforce, or both?").

[128] *Notice* at paras. 109-10.

the Commission's proposal through defense of "unreasonable discrimination" as a way to render the rules ineffective and toothless, even though the same opponents have previously decried any such action as "common carrier" treatment on Internet access services.[129] Such a standard would be far more vague and arbitrary than a clear and unambiguous rule against discrimination. The Commission has applied a more stringent standard than "unjust and unreasonable discrimination" in other provisions of Title II,[130] and should do so in this context as well. A vague and arbitrary standard would create more uncertainty for investors, content providers, users, and the service providers themselves; would create opportunities for harmful anti-consumer and anti-competitive loopholes; and would render effective enforcement far more difficult. Such a standard cannot be meaningfully applied to a generative, multi-purpose network such as the Internet, in which typical network behavior and usage patterns can change dramatically and permanently in a period of days, making it impossible to accurately predict future harm of any network operator activity that restricts user or content provider innovation[131] -- and thus impossible to gauge, based solely on the activity itself and ignoring its context, repercussions, and alternatives, whether or not an activity imposes "unreasonable" discrimination.

But even in the single-purpose network for which Section 202's "unjust and unreasonable discrimination" was applied, it did not act alone in protecting consumers and competition -- it was one of a set of standards that all acted in concert to protect consumers. The Commission must not cherry-pick one piece of the complex historical framework for the telephone network and declare it sufficient to protect the open Internet (an entirely different sort of network) against maleficent behavior. The framework of "unjust and unreasonable discrimination" of section 202 was paired in Title II with powerful protections for consumers and for competition, including interconnection and a range of open access requirements. Some of these other requirements in Title II also apply a stringent standard for nondiscriminatory behavior in various forms, without appending the qualifiers of "unjust and unreasonable"[132] -- belying any contentions that clear nondiscriminatory rules would exceed the restrictions of the Title II framework. Choosing just one piece of the Title II framework and extending it

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[129] *Compare* Comments of AT&T, WC Docket No. 07-52, at 79-85 (Feb. 13, 2008) (including an entire section entitled "Common-Carrier Regulation of Business-to-Business Performance Enhancement Arrangements Would Be Anachronistic, Inefficient, and Legally Unjustifiable") *with* Ex Parte Letter of AT&T to Chairman Genachowski, GN Docket No. 09-191 at 2 (Dec. 15, 2009) ("[A]ny policy promoted here by the Commission that seeks to achieve 'non-discrimination' should, at a minimum, be flexible enough to accommodate the types of voluntary business agreements that have been permitted for 75 years under Section 202 of the Communications Act of 1934 which forbade 'unjust or unreasonable discrimination.'").

[130] *See Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers*, First Report and Order, CC Docket Nos. 96-98, 95-158 (1996), at para. 217 (interpreting Congressional intent in using the concept of "nondiscriminatory" in Section 251(c)(2) to convey a "more stringent standard" than "unjust and unreasonable discrimination" as used in Section 202(a)).

[131] *See Notice* at para. 109 (characterizing the Internet as distinct from other communications networks designed for a single application, and emphasizing the importance of a bright-line rule against discrimination for promoting end user choice in Internet usage).

[132] *See* 47 U.S.C. § 251(c)(2) ("In addition to the duties contained in subsection (b) of this section, each incumbent local exchange carrier has the following duties: … The duty to provide, for the facilities and equipment of any requesting telecommunications carrier, interconnection with the local exchange carrier's network… on rates, terms, and conditions that are just, reasonable, and nondiscriminatory."); 47 U.S.C. § 224(e) ("The Commission shall, no later than 2 years after February 8, 1996, prescribe regulations in accordance with this subsection.… Such regulations shall ensure that a utility charges just, reasonable, and nondiscriminatory rates for pole attachments."); 47 U.S.C. § 271(c)(2)(B) ("Access or interconnection provided or generally offered by a Bell operating company to other telecommunications carriers meets the requirements of this subparagraph if such access and interconnection includes each of the following:… Nondiscriminatory access to network elements … Nondiscriminatory access to the poles, ducts, conduits, and rights-of-way owned or controlled by the Bell operating company at just and reasonable rates… Nondiscriminatory access to—(I) 911 and E911 services; (II) directory assistance services… and (III) operator call completion services…. Nondiscriminatory access to databases and associated signaling necessary for call routing and completion… Nondiscriminatory access to such services or information as are necessary to allow the requesting carrier to implement local dialing parity.").

to an entirely distinct network and model cannot suffice as a complete regulatory solution, whether that piece is "unjust and unreasonable discrimination" from section 202, the multipurpose interconnection requirements from section 251 and 256, or the strong but narrowly focused unbundling requirements from section 271. Choosing the section that applies the weakest standard for behavior would be particularly harmful for consumers.

Reasonable Network Management

The Commission must adopt a clear and meaningful reasonable network management standard, with sufficient guidelines and limitations to provide clarity to network operators, consumers, and content, application, and service providers. "Reasonable network management" has been proposed as a qualifier on each of the Commission's other proposed rules. Thus, establishing a clear and meaningful standard, centered around the Commission's statutory mandate of promoting the public interest in the provision of communications services, is essential to all of the protections sought by the Commission in the *Notice*. On the other hand, a definition of reasonable network management fraught with loopholes would create uncertainty for network operators, investors, and Internet users, and would lead to certain errors in future balancing of the harms and benefits of network management practices. The Commission's proposed definition is circular, ambiguous, and incomplete, and without further definition will create loopholes and result in future errors in policymaking.

Before the proceeding can achieve "an informed, fruitful discussion," a solid foundation must be laid.[133] At the outset, the Commission should be clear on its terminology. The Commission should recognize what "reasonable network management" means, and how it fits into this proceeding. The terms congestion management, quality of service and prioritization all have meanings *separate and distinct* from reasonable network management. Reasonable network management is the over-arching term used by the Commission in the Internet Policy Statement.[134] The term does not describe any specific practices or purposes. Rather, it is meant to describe all techniques that the Commission wishes to permit as a matter of public policy even though the techniques are discriminatory or otherwise harmful to the open Internet. The term includes such actions as attempts to mitigate the harms of malicious traffic. In contrast, the term congestion management includes any practices that are employed when a network is congested. Some of these practices are reasonable, others undoubtedly unreasonable. The term quality of service is used to describe processes that classify traffic by its predefined importance, and incorporate knowledge of that importance in network routing. Quality of service can be intended to generate additional revenue, by allocating additional importance to traffic for which a premium price has been paid.[135] Thus, quality of service can include "pay for priority" systems that the Commission has proposed to be unreasonable.[136] Prioritization is a network layer mechanism to reorder or selectively drop packets while in transmission, slowing some down and speeding others.[137] Prioritization is often used to implement a quality of service scheme, but it can be used in other contexts. These four terms are distinct, and we urge the Commission and all parties to this proceeding to recognize and acknowledge, in particular, that quality of service is not the functional equivalent of reasonable network management.

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[133] *Notice* at p. 91 (Statement of Chairman Julius Genachowski).

[134] *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, CC Docket No. 02-33, Policy Statement, 20 FCC Rcd 14986 (2005).

[135] *See infra*, Section IV. C.

[136] *Notice* at para. 106.

[137] *See* M. Chris Riley and Robb Topolski, "The Hidden Harms of Application Bias" (Nov. 2009), *available at* http://www.freepress.net/files/The_Hidden_Harms_of_Application_Bias.pdf ("*Hidden Harms of Application Bias*").

To evaluate the reasonableness of network management practices, the Commission should adopt a clear two-part standard of *purpose* and *means*. Network management practices are reasonable when they advance a public interest purpose (supported by evidence that such a purpose is not hypothetical in the context of the practice), and when they use means that are geographic, temporal, and proportional with respect to that purpose. A purpose and means test that permits only proportional, public interest-measured discrimination will maintain a level playing field for both personal and commercial communications, and will sustain the Internet's environment of innovation without permission.

These prongs should be rigorous. A primary objective of the Commission should be to foster the creation of an environment in which the first goal of a network operator is efficient network investment, not profiting from artificial scarcity.[138] The public is best served by an industry that strives to invest in capacity to grow, not to better maintain and manage scarcity. Reasonable network management should always be evaluated from within this framework, and should be set as a high bar to permit flexibility where needed but to encourage efficient investment and growth.

The Commission Must Not Define Reasonable Network Management as "Reasonable Practices."

The Commission's proposed definition of "reasonable network management" as "reasonable practices" misses the mark. The proposed definition could create loopholes and exceptions that completely swallow the rule, because it is not complete -- it makes no attempt to define the scope of "reasonable" practices, and it is therefore circular.[139] Avoiding any definition of "reasonable" or "reasonable practices," and neglecting to provide an evaluation standard leaves excessive (or even unbounded) discretion to the Commission in future cases to determine any practice to be either reasonable or unreasonable, which could permit activity by network operators that fully undermines the Commission's other proposed rules. This undermines the entire spirit of the open Internet rulemaking proceeding, which is to provide guidelines that go above and beyond purely case-by-case adjudication, and to increase certainty for all parties and to increase protections for consumers. Flexibility must be maintained -- but not total flexibility to engage in any activity that ostensibly serves a valuable purpose, no matter how parochial or hypothetical the purpose, or how harmful or overbroad the activity may be.

In the *Notice*, the proposed language contained no discussion of any limitations on *practices*, merely including a white list of *purposes* for which some forms of network management might be considered reasonable.[140] This proposal offers no clarification to service providers, who know they can engage in some activities to manage congestion and to deal with security threats, but who cannot know whether any specific methods for managing congestion will be considered by the Commission to be meaningful -- and in fact, they have no guidelines whatsoever, particularly as the Commission chose not to extend the precedent established in the Commission's recent adjudication against

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[138] The Canadian equivalent of the Federal Communications Commission, the Canadian Radio-television and Telecommunications Commission (CRTC), requires investment to be the first response of network operators to congestion. *See Review of the Internet traffic management practices of Internet service providers*, Telecom Regulatory Policy CRTC 2009-657 (Oct. 21, 2009), *available at* http://www.crtc.gc.ca/eng/archive/2009/2009-657.pdf, at para. 2 (CRTC ITMP Policy) ("Network investment is a fundamental tool for dealing with network congestion and should continue to be the primary solution that ISPs use."). The framework established by the CRTC for evaluating whether to permit a discriminatory network practice requires the network operator to show that "network investment or economic approaches alone would not reasonably address the need and effectively achieve the same purpose" as the practice. Ibid. at para. 43.

[139] Indeed, the proposed CFR states, "Reasonable network management consists of… other reasonable network management practices." See *Notice* at Appendix A.

[140] *Notice* at para. 135.

Comcast.[141] This proposal offers no reassurances for consumers, who cannot know whether any nefarious practices -- even those used by Comcast and struck down by the FCC in its past adjudication, or practices more egregiously overbroad and harmful -- would be determined to be "reasonable" if their network operators can demonstrate any benefit to congestion or utilization for any classes of traffic (even if substantial harm also results to other classes of traffic).

The Commission must provide clear, meaningful criteria or standards for evaluation of both practices and purposes. The Commission must lay out a clear standard for legitimate purposes, establish a threshold for demonstrating the purpose, and define clear and measurable criteria to evaluate the legitimacy of the practice adopted by the network operator, taking into account its ostensible purpose.

Reasonable Network Management Cannot be a List of Categories of Activities

The Commission should not define categories of practices or purposes that are either always or never reasonable, as any such categorization would quickly become outdated. Furthermore, such an approach ignores most of the *factors* that determine whether an act of network management should be considered reasonable. Finally, a category system buttressed with a generic and circular concept of "reasonable" would fail to provide clarity and certainty, and would fail to protect consumers or provide flexibility to network operators.

Regulatory lists or categories in contexts such as this one, purporting to identify what is and is not legitimate, would inevitably become incomplete, obsolete, and inflexible to maintain over time. And yet, the Commission has proposed such a set of categories.[142] Adopting a whitelist of practices and contexts that are acceptable, or a blacklist of practices and contexts that are unacceptable, or both together, would place many current and future practices, some legitimate and some illegitimate, in a gray in-between area. These practices would be evaluated by a future Commission on a blank slate, without guidance, creating the potential for adjudications that permit illegitimate behavior that harms consumers, or adjudications that strike down legitimate behavior -- and no consumer or service provider has any information to determine the likelihood of either of these outcomes.

Perhaps because any such list would grow outdated and develop substantial gaps, the Commission has proposed "other reasonable network management practices" as a broad open-ended addendum to its list.[143] Such an addendum recognizes the need for flexibility but goes too far. A rule that defines "reasonable network management" to include "other reasonable network management practices" confers complete flexibility to a future Commission to declare any practice to be "reasonable" in a specific case, without applying any standard of evaluation for its determination. Furthermore, without having any previously established rules to interpret, a reviewing court may have trouble finding any basis for evaluating the Commission's action, and thus may be unable to reverse even a blatantly poor Commission decision. Such a possibility would completely undermine the objectives that this proceeding is ostensibly sets out to achieve. It also would generate tremendous uncertainty for network operators, who face barriers and risks in taking advantage of the supposed flexibility offered by such a rule -- an unfriendly Commission might declare nearly any practice to be unreasonable, for the most minute of unrecognized details, and a reviewing court would similarly have no standard by which to evaluate whether the Commission's actions were arbitrary and capricious.

[141] *Notice* at para. 137.

[142] *Notice* at paras. 135-36.

[143] *Notice* at para. 135.

It would be overbroad to call any practice that serves the purpose of "congestion management" legitimate, without any further examination of the nature of the practice and its relationship to its ostensible purpose. Not all actions intended to achieve a legitimate purpose are equally reasonable at all ways and at all times -- and many actions, although they serve the purpose of congestion management, function in ways that are unreasonable. Furthermore, if a practice ostensibly intended for congestion management is in use in an environment without congestion or substantial utilization, any harm it causes is unnecessary because the stated purpose is to remedy a problem that does not currently exist.

Even if a practice benefits an acceptable purpose, that practice may nevertheless be unreasonable because of the means of its operation. The Commission recognized this in its recent Comcast adjudication.[144] The *Comcast Order* specifically separated the "interest" served by the practice from the "means" employed by that practice, and declared Comcast's means to be unreasonable.[145] Although the *Notice* specifically disavowed the precise standard adopted in the *Comcast Order*, in places it indicates some level of skepticism for specific network management methods, for example in stating "we believe that it would likely not be reasonable network management to block or degrade VoIP traffic but not other services that similarly affect bandwidth usage and have similar quality-of-service requirements."[146] But in other respects, the *Notice* takes a vague and clumsy attitude towards the question of legitimacy of means, by centering the concept of reasonable network management around three "categories" based solely on the purpose and not the method of the practice.[147]

The Commission should not retreat from the clarity achieved in the *Comcast Order*, and should continue to closely examine not only the purpose of a network management practice, but also its means. The reasonableness of a practice must be determined in part by the specific aspects of its mechanism and impact, because if the practice is unnecessarily harmful, it cannot be considered "reasonable." The Commission should consider not just the "why" of a practice, but also the "where", the "what", the "who", and the "when".[148] If a practice is overbroad in any of these respects, and especially if such overbreadth is not technically necessary and slows or degrades any Internet traffic, then the practice is not reasonable.

The Commission has already witnessed an "over inclusive" practice, and declared it unreasonable in the *Comcast Order*.[149] Although purportedly intended to deal with network congestion caused by heavy utilization, the Commission found that Comcast's practice harmed Internet users who used very little bandwidth.[150] The Commission also found that the practice operated at all times of day, not merely when there was actual heavy utilization or congestion.[151] Finally, the Commission found that the practice was applied over a broad geographic area, even though congestion is a highly

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[144] *Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices; Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management,"* File No. EB-08-IH-1518, WC Docket No. 07-52, Memorandum Opinion and Order, 23 FCC Rcd 13028 (2008) (*Comcast Order*).

[145] *Comcast Order* at paras. 47-48.

[146] *Notice* at para. 137.

[147] *See e.g.*, *Notice* at para. 141 ("We seek comment on how to evaluate whether particular network management practices fall into one or more of these categories and on who should bear the burden of proof on that issue.").

[148] *See* Scott Jordan, "Four Questions that Determine Whether Traffic Management is Reasonable," *IFIP/IEEE International Symposium on Integrated Network Management (IM)*, at 137-40 (June 2009).

[149] *Comcast Order* at para. 48.

[150] *Ibid*.

[151] *Ibid*.

localized phenomena.[152] The Commission also found the network management technique to be poorly tailored for its stated purpose of congestion management, as many heavy uses of bandwidth that generated congestion were not restricted in any way[153] -- the sort of differential treatment that seems to raise red flags in the current *Notice*.[154]

Comcast's practices were not only poorly tailored to its objective -- they were likely deliberately misaligned, because there were ready alternatives that Comcast could have used. As the Commission noted, Comcast ignored well-known methods to achieve its ostensible objective that seemed better tailored to the result.[155] In fact, following the *Comcast Order*, Comcast adopted such a method -- it switched to a protocol agnostic method for congestion management, applied precisely in those regions and at those times where utilization thresholds were high enough to indicate a substantial probability of congestion, and directed towards precisely those users who were contributing disproportionately to the congestion, regardless of what applications they were using.[156] Comcast's new method identified and focused on the geography and the times when congestion was a demonstrable concern, and acted precisely and proportionately to reduce the traffic of sources of congestion. Had a non-discrimination rule been in place that was bound by a purpose and means test, it is likely that Comcast would have initially implemented the more reasonable network management practice. However, had a non-discrimination rule been in place that was only bounded by the weak purpose guideline of "mitigating the effects of congestion," it is not as clear whether the company would have chosen the more reasonable and tailored protocol agnostic management practice, as blocking peer-to-peer uploads may have served a more dark purpose of stifling the legal distribution of online video content.

The *Notice* keeps the definition of "reasonable network management" open ended.[157] The *Notice* not only keeps open the scope of acceptable purposes, but also fails to provide any limitations or even guidelines for what might constitute "reasonable" or "unreasonable" means. Although flexibility is valuable, it should not come at the cost of all reliable consumer protections, and all certainty for users, content and applications providers, investors, and the network operators themselves. Moreover, it does not need to -- flexibility and strong consumer protections can coexist. The Commission should look not only to its own past *Comcast Order*, but also to reasonable network management practices and legal frameworks in other countries. All of these examples balance consumer protections and flexibility through a rigorous two-prong test that examines both purposes and means of network management practices.

Comcast, Canada, and Japan All Apply a Two-Prong Test for Purpose and Means

In the *Comcast Order*, the Commission held that demonstrations of reasonable network management should "clear a high threshold."[158] Specifically, reasonable network management practices must 1) "further a critically important interest," and 2) "be narrowly or carefully tailored to serve that interest."[159] The *Notice* indicates that the Commission now believes, in the context of a rule-

[152] *Ibid.*

[153] *Ibid.*

[154] *Notice* at para. 137 ("[W]e believe that it would likely not be reasonable network management to block or degrade VoIP traffic but not other services that similarly affect bandwidth usage and have similar quality-of-service requirements.").

[155] *Comcast Order* at para. 49.

[156] *See* "Attachment B: Comcast Corporation Description of Planned Network Management Practices to be Deployed Following the Termination of Current Practices," Comcast Corporation, *at* http://downloads.comcast.net/docs/Attachment_B_Future_Practices.pdf (Comcast Protocol Agnostic Practices).

[157] *Notice* at para. 141.

[158] *Comcast Order* at para. 47.

[159] *Ibid.*

based framework, the precise boundary points adopted in the *Comcast Order* would be too restrictive to apply broadly, and seeks comment on this proposal.[160] Although the standard adopted in the *Comcast Order* does not seem excessively restrictive if interests as broad and flexible as "congestion management" are held to be "critically important", the Commission should not retreat from the fundamental framework of the standard in its reconsideration of the specific thresholds. The two-prong framework applied in the *Comcast Order* remains valid and essential for any accurate evaluation of a network management practice -- first, the Commission should consider the merits of the interest or purpose served by the management, and second, the Commission should examine whether the means used go above and beyond advancing that interest and unnecessarily intrude on legitimate behavior.

This same framework was recently applied in Canada to deal with the question of reasonable network management.[161] The Canadian Radio-television and Telecommunications Commission (CRTC) recently adopted a framework for evaluating traffic management practices upon a complaint.[162] In this analysis, the network operator must demonstrate the practice, including its need, purpose, and effect, as well as whether the practice discriminates against or in favor of traffic.[163] If the practice discriminates, the provider must also show that the practice "is designed to address the need and achieve the purpose and effect in question" and discriminates "as little as reasonably possible" and with minimal harm, and that the purpose could not reasonably be addressed through network investment.[164] The CRTC framework examines the purpose and the effect of the technique in detail, and the nature of the practice and its relationship to the purpose and intended effect.

An industry consensus document in Japan -- a set of industry practices produced and voluntarily followed by providers of Internet access service -- follows this model precisely, in the context of packet shaping used to deal with network congestion.[165] The Japanese approach explicitly identifies three prongs that must be met for packet shaping "to be regarded as an act performed in the pursuit of lawful business by ISPs": legitimacy of purpose, necessity of action, and validity of means.[166] The purpose prong establishes that the packet shaping serves a legitimate purpose, not purely a harmful one; the necessity of action prong supplements this by requiring objective data to demonstrate that the alleged purpose indicates a real problem. Once these are established, the final prong examines whether packet shaping is a valid means to achieve the ostensible purpose, in context of the supporting data.

As indicated, all of these approaches follow the same framework, a two-prong test of purpose and means. The first question asks whether the purpose for which the practice is conducted is one that is somehow acceptable, even if the practice violates other Internet rules; the purpose also must be meaningful and supported by objective data (particularly when the purpose is congestion management), rather than merely an asserted hypothetical scenario. The second question, raised if the purpose is acceptable, asks whether the practice's precise techniques and contexts are valid for achieving that purpose, or in fact go above and beyond that purpose. The Commission should adopt a standard within this model, such as that proposed in these comments.

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[160] *Notice* at para. 137.

[161] *See* CRTC ITMP Policy, *supra* note 142.

[162] *Ibid.* at para. 43.

[163] *Ibid.*

[164] *Ibid.*

[165] "Guideline for Packet Shaping," Japan Internet Providers Association (JAIPA), Telecommunications Carriers Association (TCA), Telecom Services Association (TELESA), and Japan Cable and Telecommunications Association (JCTA) (May 2008), *at* http://www.jaipa.or.jp/other/bandwidth/guidelines_e.pdf (Japanese Guidelines).

[166] *Ibid.* at p. 8.

Reasonable Network Management Should Serve a Public Interest Purpose

The Commission should apply a "purpose" standard that allows for flexibility in future network management, without including anticompetitive purposes or purposes that intentionally harm innovation or consumer choice. Commenters propose that the Commission apply a "public interest purpose" standard, backed by an evidentiary showing that the purpose is real and not hypothetical in the network context at issue. Such a standard would examine whether the purpose serves a public interest or benefit, or whether it serves purely a private benefit of the network operator or a third party. This standard fulfills the fundamental responsibility of the Commission to promote the public interest in communications services. The "reasonable network management" definition is, after all, an exception. Assuming that public policy requires providers of Internet access service to comply with certain rules, and that a set of exceptions is appropriate for certain situations where the service providers *need* to violate the rules, these exceptions should not be construed so broadly as to permit violations that are not demonstrably in the public interest.

The specific purposes identified by the Commission -- congestion management, harmful traffic, and unlawful traffic -- can, with proper supporting data, be considered "public interest purposes." Severe congestion causes massive disruptions in usage of the Internet access service, causing harm to many Internet users and to the value of the Internet infrastructure to the public at large. Similarly, spam and malicious Internet traffic can plague and severely harm users, and contribute greatly to congestion and other network-wide problems. Finally, although the *Notice* reiterates that the rules apply only to lawful uses of the Internet[167] and therefore "reasonable network management" dealing with unlawful traffic is somewhat redundant, the purpose of minimizing public and widespread harms created by unlawful traffic serves the public interest, as the other principles do, when the purpose focuses on public and widespread harm.

The Commission should require that the "public interest purpose" be demonstrated through objective data.[168] A public interest purpose includes a demonstrable problem, in the specific context of the network in which the practice at issue is applied, and must not be merely a hypothetical or abstract purpose. For example, if the public interest purpose is congestion management, ISP should track and report its precise utilization levels at the times and in the regions where the practice is employed. If the public interest purpose is protection from harmful Internet traffic, the provider of Internet access service should maintain and (where and when appropriate) publish traffic logs and sources indicating the harmful traffic.

A "public interest purpose" standard strikes the proper balance between permitting legitimate ends and prohibiting illegitimate ends. When supported by evidence, the standard distinguishes between reasonable network management practices that deal with demonstrable problems, and practices that purport to address general problems like "congestion" but secretly serve to achieve anticompetitive ends, such as discouraging the adoption and growth of online services that compete with services offered by the provider of Internet access service.[169] Furthermore, to the extent any "socially beneficial forms of discrimination" may exist,[170] such forms of discrimination would presumably serve a public interest purpose. Presumably, such forms would presumably use

[167] *Notice* at para. 139.

[168] The Japanese industry consensus document may provide a useful guideline for this, as they discuss the need for objective data and establishing the necessity of action. *See* Japanese Guidelines, *supra* note 142.

[169] *See Comcast Order* at para. 47 ("Comcast's practice selectively blocks and impedes the use of particular applications, and we believe that such disparate treatment poses significant risks of anticompetitive abuse.").

[170] *See Notice* at para. 114.

appropriate and not overbroad means to achieve that purpose -- otherwise, alternative means could be used that have the same benefits without the same harms.

Reasonable Network Management Should Be Narrow in Means -- Valid in Geography, Time, and Proportion

Valid means to achieve a public interest purpose should apply only in network regions where problems are demonstrable.[171] This scope will vary by the type of problem and the purpose, as well as the underlying access technology. For example, congestion is typically a localized phenomenon that occurs at one or more points in the network where utilization is high. Often, particularly in shared last-mile access networks, the high utilization is present at the first aggregation point of users -- the node in a cable system, the central office or remote terminal in copper or fiber-to-the-home networks, the cellular tower in mobile wireless networks, and the satellite for satellite connections. Utilization thresholds can be (and likely are) measured for each of these points in a network; if a network management practice, ostensibly intended to manage congestion, applies at nodes, central offices, or other locations where utilization thresholds are extremely low, even if it also (legitimately) applies to other nodes, central offices, or other locations where utilization is high, then the practice does not use a valid means.

The Commission faced this question in the *Comcast Order*.[172] Filings in the proceeding demonstrated that Comcast's BitTorrent blocking took place through a portion of Comcast's network greatly exceeding a single node.[173] The Commission found that the broad scope of Comcast's practice "does not appear to target only those neighborhoods that have congested nodes," and identified this as one of three ways in which Comcast's methods were overbroad and thus not reasonable.[174] The practices adopted by Comcast following the order, however, are geographically focused -- they apply only in those nodes where utilization exceeds a high, predetermined threshold, and not in other, uncongested nodes.[175]

When a practice serves other public-interest purposes, the relevant area may be much different, including a larger area of the network or even the entire network. For example, a distributed denial-of-service attack may originate from a large number of distinct end nodes within and outside the provider's network, affecting a large number of aggregation points within the network and border routers connecting the network to other networks. A practice designed to deal with the public interest purpose of stopping harmful security threats to the network could reasonably be applied at any point where the harmful traffic is attempting to enter the network.

Valid means to achieve a public interest purpose should apply only at times when the problems actually exist. As with geography, the appropriate time threshold may vary by the public interest purpose and by the underlying access technology. For some public interest purposes, such as defense against spam, the appropriate time threshold may indeed be "all the time." However, others such as throttling of users (in response to congestion) or blocking of addresses (in response to a distributed denial of service attack) must be narrow responses to specific problems, and must no

[171] Although this section is called "geography", the term is used for convenience, to indicate specific, precise regions in the network regardless of their physical, geographic location.

[172] *Comcast Order* at para. 48.

[173] Even if Comcast had identified utilization thresholds justifying management, its practices were inherently overbroad, as they were applied at the level of a metropolitan area rather than at a single node. *See Comcast Order* at para. 48, n.224 and n.225.

[174] *Comcast Order* at para. 48.

[175] *See* Comcast Protocol Agnostic Practices, *supra* note 160, at p. 2.

longer operate when the problem at issue has gone away. The purpose of these rules and this entire proceeding is to ensure that the Internet remains a robust and open platform and infrastructure. Permanent states of congestion and congestion management indicate larger problems with the network that should be remedied through investment in capacity, not perpetual management of scarcity.[176]

Practices intended for congestion management, in particular, should be applied only when utilization exceeds a reasonable threshold, and should no longer be conducted once utilization has fallen below a reasonable threshold.[177] Appropriate thresholds may vary by technology, and the Commission may choose to evaluate a provider's chosen threshold on a case-by-case basis. However, practices for congestion management adopted by providers of Internet access service should apply consistent and disclosed thresholds, to prevent any gaming for anticompetitive purposes.

The practices for congestion management adopted by Comcast subsequent to the Commission's *Comcast Order* offer an example of appropriate temporal scope. Comcast's application-agnostic throttling mechanism is only triggered in situations where utilization at either the upstream or downstream port in a node has exceeded a high, predetermined threshold over a period of fifteen minutes; and once utilization in that port has dropped below that threshold, the technique will no longer by applied.[178] The precise determinations of "appropriate" should be left to the Commission and resolved through case-by-case application. For example, although a fifteen minute period of limitation may be appropriate, had Comcast's network management system been activated for fifteen *days* following a single fifteen *minute* window of high utilization followed by fourteen days of light utilization, such a mechanism would no longer be temporally focused.

Valid means to achieve a public interest purpose should be proportional in the context of the purpose (along with objective supporting data demonstrating the purpose) and the network technology. The means should be precise and fine-grained, such that they do not cause unnecessary harm through degradation or blocking of legitimate traffic and legitimate users. Practices that target harmful network traffic such as denial-of-service attacks should use standard and widely-accepted methods to identify traffic or addresses to block. These methods may create harm to innocent users -- for example, if an IP address corresponding to a Network Address Translator is temporarily blocked because one user within the NAT is originating a denial-of-service attack -- but the test is for "proportional" methods, not "perfect." In the current hypothetical, it may or may not be practical within a specific network technology to target blocking to a specific user within a NAT; as a result, blocking the entire NAT may be necessary to defend against the attack. However, blocking the entire Class A of addresses that includes that IP address would not be proportional, as it would generate substantial harm (by blocking millions of unaffected nodes) and could easily be replaced with a more fine-grained solution.

As with geography and time, the Commission faced the question of proportionality in the *Comcast Order*. The practice employed by Comcast, although ostensibly intended to deal with congestion, in fact affected users and traffic that did not substantially contribute to congestion -- it applied to all BitTorrent traffic, even low-bandwidth communications from users who were not using

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[176] *See* CRTC ITMP Policy, *supra* note 142, at para. 2. ("Network investment is a fundamental tool for dealing with network congestion and should continue to be the primary solution that ISPs use.").

[177] It would be appropriate for the "off" threshold to be enough lower than the "on" threshold to avoid thrashing; however, both thresholds should be substantially high as to ensure that congestion management techniques are not operating continuously, but remain an exception.

[178] *See* Comcast Protocol Agnostic Practices, *supra* note 160, at p. 8.

excessive levels of bandwidth.[179] The practice was similarly disproportional in that it failed to affect heavy uses of data traffic that contributed substantially to utilization and congestion, if such uses did not involve the BitTorrent protocol.[180] In the *Comcast Order*, the Commission applied a stringent standard for the validity of the practice; but under any user friendly standard, practices that are unnecessarily harmful, when less harmful alternatives could be used, would not be considered proportional approaches.

The proportionality test offers a safety valve to allow the Commission to apply the same rules to all access technologies, including all wireless networks, while still accommodating differences in those technologies.[181] Certainly, some older or otherwise restricted access technologies, including some forms of DSL, satellite, and mobile wireless, have more substantial and diverse constraints than other technologies, introducing in particular the possibility of greater levels of congestion.[182] In many ways, the questions surrounding the legitimacy of a congestion management practice are, and should be, technology agnostic -- has the provider demonstrated high utilization? Does the practice occur where, and when, utilization is high and congestion is a risk? However, given that physical network equipment varies, different access technologies may permit more or less fine-grained mechanisms to identify the limit the source of congestion, and the Commission can apply a "proportionality" test to examine, in the context of the technology and the demonstrable problems at issue, whether specific mechanisms are reasonable.[183] Under no circumstances should the Commission abandon meaningful evaluation of whether the practices are proportional, by simply allowing wireless network operators to block video applications[184] or adopt other overbroad techniques -- crude exemptions and loopholes create substantial harm to competition, innovation, and consumers, and undermine the rules and their potential benefits.

Application Bias is Not a Proportional Response to Congestion

Rules to preserve the open Internet must not permit the categorical imposition of application bias, because application bias is unnecessary, inefficient, and harmful to innovation, competition, and consumer choice. The Commission notes that some parties have called for the support of "a network management practice of prioritizing classes of latency-sensitive traffic over classes of latency-insensitive traffic."[185] This practice, called *application bias*, places control over speech, competition, and even commerce in the hands of the network operators -- the same dangers the open Internet proceeding seeks to avoid. These harms occur even if the application bias is not made upon request or payment from content or applications vendors.[186] Even if applied only in contexts of congestion (the only contexts where the technique can have any benefit), and even if applied without accepting anticompetitive payments for priority, application bias is not categorically a proportional response to congestion, because it harms many uses of the Internet and the overall network performance, while locking the Internet into typical, static use patterns and frustrating both minority and innovative uses

[179] *Comcast Order* at para. 48.

[180] *Ibid.*

[181] *See Notice* at para. 13, para. 171.

[182] *Notice* at para. 172.

[183] For example, say for the sake of argument that the normal industry-wide contention ratio for residential DSL is 50:1; if a particular residential DSL provider is experiencing congestion problems, but the contention ratio on their local network is 200:1, then this suggests the congestion may be managed through the process of normal network investment, or by reducing the level of over-subscription through other means.

[184] *See Notice* at para. 173.

[185] *Notice* at para. 137.

[186] *See* Notice at para. 113.

of the network.[187] Any use of application bias as a network management practice should go through the same evaluative framework as other practices -- the network operator should identify a specific context showing a public interest purpose, and should demonstrate that application bias is a temporally and geographically constrained, proportional response to further the public interest purpose.

Application bias should face a high barrier to a showing of proportionality, even in the context of demonstrated congestion, because the technique centers around harmful and inefficient assumptions of priority. In prioritizing some classes of traffic, application bias degrades others -- when one packet is sped up, another is slowed down.[188] On top of this individual harm, application bias may produce harm to the overall network -- the overhead generated by the tools to engineer application bias may add packet delay, and the greater latency of packet delivery for low priority traffic will increase the number of dropped and retransmitted packets, perversely increasing network utilization and thus congestion.[189]

Mistaken classifications of priority create even more harm. Although network operators attempt to place latency sensitive applications into the high priority class, this categorization is inherently imperfect because not all users use protocols or applications in the same way -- for example, streaming video is not particularly latency sensitive when a small buffer is used, whereas peer-to-peer protocols can be used for very "high priority" purposes even if such use is not typical.[190] The result of permitting application bias would be a "lock-in" of the majority Internet of 2010: common, popular uses of the Internet today, by the majority of users could be given a priority (and likely would), while new uses and less-common uses would be degraded.[191] This lock-in would risk stifling or frustrating minority voices or expressions online. Because no categorization system can eliminate inter-category competition or substitutability, application bias would also increase barriers to entry for innovative uses of the Internet by degrading their performance, particularly as compared to established incumbent uses.[192]

Furthermore, the need for application bias has not been demonstrated. No showing has yet been made that *any* application needs prioritization to function.[193] Despite the lack of a demonstrable need, the purported need for application bias is to ensure "quality of service" for latency sensitive applications -- a misleading term, as ensuring high quality of service for an Internet application would require end-to-end agreement among multiple network operators to maintain a level of priority for certain traffic, which is not currently feasible across the Internet. True quality of service thus seems both unnecessary, and also unlikely. Instead, by invoking the term "quality of service," proponents of application bias seek to use prioritization as a short-cut around investment. This short-cut only serves to help some applications suffer less from the impact of congestion than other applications -- application bias cannot enable more powerful applications like telemedicine, because the technique

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[187] *See* M. Chris Riley and Robb Topolski, "The Hidden Harms of Application Bias" (Nov. 2009), *available at* http://www.freepress.net/files/The_Hidden_Harms_of_Application_Bias.pdf ("*Hidden Harms of Application Bias*").

[188] *Ibid.* at 2 ("[W]ith congestion, prioritization forwards higher priority packets ahead of other traffic, and lower priority packets are negatively affected until there are no higher priority packets to send. Prioritization operates by degrading and harming lower priority traffic, because (by definition) more low priority packets are delayed or dropped.").

[189] *Ibid.* at 4-5.

[190] *Ibid.* at 6.

[191] *Ibid.* at 6-7.

[192] *See ibid.* at 7 (offering a hypothetical of the emergence of YouTube, given the incumbency of RealVideo, and the ready ease of creating distinct categories between the two ultimately substitutable technologies, making possible the imposition of a relative performance advantage to the incumbent).

[193] *Ibid.* at 8.

cannot create a bigger pipe.[194] And, as a form of congestion management, application bias is hardly a proportional response, given its propensity for incorrect determinations of priority. Even in the face of a hypothetical future demonstrable need for priority, network operators could allow users to make priority judgments without imposing the same harms to competition, innovation, and consumer choice.[195] The burden of "proportionality" for an unnecessary technique, when less harmful alternatives exist, should be considerable.

The harms of mistakes in priority classification are substantial. Application bias -- which takes priority decisions away from users, and places them in the hands of network operators who are ill positioned to make such decisions accurately -- is fundamentally a flawed technique, and must not be encouraged or broadly permitted.

Managed Services

The Commission seeks comment broadly on "managed or specialized services,"[196] ranging from the definition,[197] to the functions and operations of such services,[198] to the proper regulatory treatment,[199] to the impact of such services on the goals of the open Internet rulemaking.[200] The Commission wisely asks broad questions about a category of services that remains nebulous on numerous technical and regulatory levels, and yet is often used as a justification for a broad waiver of nondiscrimination and other rules that the Commission has proposed to apply to Internet access services.[201]

To the extent that managed or specialized services use network capacity that could be used for Internet access service, they should be carefully supervised and regulated as needed by the Commission. No matter how the capacity is shared, these services will use capacity in the network that could otherwise be given to Internet access service. As our country remains far behind many others in typical Internet access service capacity,[202] any attempts to further divide and segregate capacity should be viewed skeptically by the Commission, as they may mask anticompetitive or otherwise harmful circumventions of the Commission's proposed open Internet rules.

As a legal matter, statutory classifications exist for a finite range of services. Telecommunications services are covered under Title II of the Communications Act, and multi-channel video programming services are covered under Title VI -- these are often considered "buckets" into

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[194] *See Hidden Harms of Application Bias* at 7.

[195] *Ibid.* at 8-9.

[196] *Notice* at para. 148-49.

[197] *Notice* at para. 151.

[198] *Notice* at para. 150.

[199] *Notice* at para. 152.

[200] *Notice* at para. 153.

[201] The use of the term "managed services" in this context may be somewhat unfortunate, as the term already has a well established meaning in the enterprise IT markets, where it refers generally to services that could be self-provisioned by a client, but instead are provided by a service provider for a fee. Such "managed services" could include basic IT network management and customized software systems development and support. When we discuss managed services, we are referring to the class of services offered over telecommunications networks as referenced in the *Notice*.

[202] OECD data as of September 2008 lists the United States 19th in average advertised broadband download speed, behind Japan, Korea, France, Finland, Netherlands, Germany, Australia, Denmark, Portugal, Iceland, New Zealand, Norway, Sweden, Italy, United Kingdom, Czech Republic, Austria, and Luxembourg. *See* OECD Broadband Portal, *available at* http://www.oecd.org/sti/ict/broadband. This calculation also fails to account for substantial disparities in the United States between advertised and actual capacity, likely larger than in other countries due to relatively higher subscriptions to shared cable modem services.

which various services are placed. Title I is the "bucket" for information services, broadly including a range of computing services that operate over wire or radio communications.[203] Voice over Internet Protocol or VoIP -- when not interconnected -- has been held to be a Title I service;[204] although interconnected VoIP has not yet been formally classified, many of the obligations of Title II have been applied to interconnected VoIP services.[205] Broadband Internet access services, once considered to include both information services and telecommunications services, now reside in the Title I "bucket" for regulatory purposes, after the Commission's deregulatory orders.[206] Services classified as pure "information services," including non-interconnected VoIP as well as web sites, email, and other Internet content, applications, and services, are delivered to the user over the last mile of an Internet access service connection.

Managed or specialized services do not readily fall into any of these buckets -- they are stand-alone communications services, offered independent of (and not technically requiring subscription to) an Internet access service, a Title II service, or a Title VI service.[207] Managed services involve telecommunications, and thus differ from pure information services and cannot be classified as such. Managed services could be classified as a type of Internet access service for purposes of the regulatory classifications of the deregulatory orders; however, such classification will (and should) subject managed services to the protections of the open Internet, because these protections were part and parcel of the Commission's deregulation. If the Commission chooses not to classify managed or specialized services as a type of Internet access service and thus subject to the same open Internet rules, the only remaining statutory alternative -- a service that includes telecommunications, but is not a Title II, Title III, or Title VI service, or an Internet access service -- is as an information service with an underlying telecommunications service component. To the extent that the Commission recognizes the existence of broadband services that are not Internet access services, such services, regardless of the nature of the transmission medium, were not covered in the Commission's deregulation of Internet

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[203] Though this is more of a heuristic classification technique than a strict regulatory classification, as information services can, through the use of ancillary authority, be subject to regulations designed to carry out other purposes contained in the Communications Act.

[204] *Petition for Declaratory Ruling that pulver.com's Free World Dialup is Neither Telecommunications Nor a Telecommunications Service*, WC Docket No. 03-45, Memorandum Opinion and Order, 19 FCC Rcd 3307 (2004).

[205] *See, e.g.*, *Implementation of the Telecommunications Act of 1996: Telecommunications Carriers' Use of Customer Proprietary Network Information and Other Customer Information; IP-Enabled Services*, CC Docket No. 96-115, WC Docket No. 04-36, Report and Order and Further Notice of Proposed Rulemaking, 22 FCC Rcd 6927 (2007) (extending CPNI rules from Title II to interconnected VoIP or iVOIP services); *IP-Enabled Services, E911 Requirements for IP-Enabled Service Providers*, WC Docket Nos. 04-36, 05-196, First Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 10245 (2005) (extending E911 rules to iVOIP).

[206] *Inquiry Concerning High-Speed Access to the Internet OverCable and Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities, GN Docket No. 00-185, CS Docket No. 02-52, Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd 4798* (2002) (Cable Modem Declaratory Ruling), *aff'd, NCTA v. Brand X*, 545 U.S. 967 (2005); *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities; Universal Service Obligations of Broadband Providers; Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services; Computer III Further Remand Proceedings: Bell Operating Company Provision of Enhanced Services; 1998 Biennial Regulatory Review—Review of Computer III and ONA Safeguards and Requirements; Conditional Petition of the Verizon Telephone Companies for Forbearance Under 47 U.S.C. §160(c) with Regard to Broadband Services Provided Via Fiber to the Premises; Petition of the Verizon Telephone Companies for Declaratory Ruling or, Alternatively, for Interim Waiver with Regard to Broadband Services Provided Via Fiber to the Premises; Consumer Protection in the Broadband Era*, CC Docket Nos. 02-33, 95-20, 98-10, 01-337, WC Docket Nos. 04-242, 05-271, Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 14853 (2005) (Wireline Broadband Order), *aff'd, Time Warner Telecom, Inc. v. FCC*, 507 F.3d 205 (3d Cir. 2007); *Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks*, WT Docket No. 07-53, Declaratory Ruling, 22 FCC Rcd 5901 (2007) (Wireline Broadband Order).

[207] Many of the purported "managed or specialized services" are better understood through an existing regulatory regime -- for example, interconnected VoIP as a Title II service, and IPTV as a Title VI service.

access services.[208] As a result, the framework established in the *Computer Inquiries*, as a legal matter, still applies such services, at least when offered over wireline broadband facilities.[209]

At a technical level, managed or specialized services could take a variety of forms. By even the limited definitions available thus far, managed or specialized services would be IP-based offerings, and would almost certainly share some if not all of the facilities used for broadband Internet access service.[210] But, regardless of their technical operation, such services will introduce potential harm to the promotion of a robust Internet infrastructure, and should therefore be carefully monitored and appropriately regulated by the Commission.

There are four ways in which such services might share facilities with Internet access services: "physical" separation, virtual separation, partially shared capacity, and fully shared capacity. In "physical" separation, traffic for both Internet access services and for managed services would be carried over the same physical last-mile connections, but would be carried on separate wavelengths or channels.[211] In virtual separation, the physical capacity used by the services is the same, but dedicated switch cycles or other capacity sharing mechanisms create a fixed amount of capacity for each of the services.[212] In partially shared capacity, capacity sharing mechanisms allow for some of the capacity to be dynamically allocated to one or another of the set of services sharing the facilities, though at any given unit of time, capacity remains divided in the pipe.[213] In fully shared capacity, all of the services fully share capacity, and differentiated treatment comes through prioritization on a packet-by-packet basis.

Without further details on how a network operator implements a "managed or specialized service," it is unclear which of these capacity sharing mechanisms is intended. As an initial matter, however, a "fully shared" service cannot support a separate statutory classification -- it is technically

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[208] This is a critical point. The Commission in the *Wireline Broadband Order* did not make a decision about the appropriate regulatory classification of all services that are or might be provided over a facilities-based carrier's network; but specifically limited the *Order* to Internet access services. See *Wireline Broadband Order* at note 15 stating: "We stress that our actions in this Order are limited to wireline broadband Internet access service and *its* underlying broadband transmission component…" (emphasis added).

[209] *Computer Inquiry* obligations thus still apply for any enhanced services offered by BOCs or other wireline common carriers which are not broadband Internet access services (regulatory obligations are more numerous for BOCs vs. other providers). The regulatory status of broadband services that are not Internet access services over cable and wireless facilities has not been defined, as the underlying *Computer Inquiries* framework did not apply to these facilities and the deregulatory orders failed to offer any definitions. It is important to note that the lack of a definition does not mean a service may not at a later point be defined by the Commission to be subject to certain requirements directly or ancillary to the provisions in the Communications Act (indeed; this was the purpose of *the Cable Modem* proceeding). The Commission can and should apply the same regulatory status of such offerings on the wireline network to offerings over wireless or cable, to the extent "managed services" are offered on such networks.

[210] *See Notice* at para. 148.

[211] For example, Verizon's FiOS networks reportedly separate its cable TV services from its Internet access services in this manner.

[212] Comcast's Digital Voice services, and the interconnected VoIP phone services of many other cable companies, are likely separated from Internet access services in such a manner; they travel over the same frequencies in the cable wires, but are separated onto logically distinct channels through routing.

[213] AT&T's U-Verse technology uses such a mechanism to share bandwidth between IPTV and Internet access services -- a priority mechanism is used for the bandwidth-bounded television channels, such that the available capacity used for Internet is at times not fully available, because the IPTV service is using some of it. *See, e.g.*, "No, AT&T Is Not Throttling U-Verse," *DSL Reports* (Sep. 12, 2008), *at* http://www.dslreports.com/shownews/No-ATT-Is-Not-Throttling-UVerse-97676 (explaining why new AT&T Terms of Service mean that HDTV use restricts the bandwidth available for Internet use, indicating partially shared capacity).

indistinguishable from the use of application bias for an application or a class of applications over an Internet access service. The harms of both are the same.

Of the other three mechanisms, both share their essential technical features and risks in common. Although they leave capacity for the offering of an Internet access service that can technically comply with the proposed consumer protections at issue in this proceeding, they also take away capacity that could otherwise be used to provide a more robust Internet access service. They also create a space in which content and applications services can be offered that substitute for content and applications services offered over an Internet access service -- possibly without facing the same consumer protections. Services offered over a partially shared capacity may raise additional issues of disclosure, as a consumer may not be able to determine at any given time how much capacity is allocated to each of the services (or how such allocation decisions are made by the network operator), although such information is essential in identifying the potential performance of the Internet access service.

Managed or specialized services represent a future, not a present, use of the broadband network. It is unclear if *any* "managed or specialized services" are currently offered to consumers.[214] Additionally, the need for the existence of a separate category for such services, or even the benefit of creating such a category, has never been demonstrated -- no network operator has conclusively shown that any such services cannot be effectively offered over the open Internet, or that further division of the already often-too-narrow broadband pipe into multiple services would be beneficial. The Commission seeks comment on whether these services will "allow providers to develop new and innovative technologies and business models."[215] No such new technologies or business models have yet been shown to be possible. A "managed service" cannot magically make a small wireless or copper data connection into a powerful pipe capable of offering real-time 2-way video or interactive telemedicine; and, with some form of congestion management in place, opening more of the capacity in the few existing large end-user connections for Internet access service should enable equivalent functionality.

At the same time, these future potential services could introduce tremendous harm. Sharing capacity with Internet access service, no matter what technical method is used, limits the capacity available to the Internet access service. Although partially shared capacity can reduce some of this harm, any moments when capacity is walled off serve to constrict the Internet access service, and may simultaneously introduce additional substantial transparency problems. Worse than constriction, though, is the potential for managed services to create a major loophole in the rules, undermining their effectiveness by allowing network operators to conduct the same harmful behavior, but by a different name. "Beneficial discrimination," if any such exists,[216] should not be categorically permitted through a new category of services, created without substantial safeguards. If any "beneficial discrimination" exists, it should be permitted only through the earlier proposed reasonable network management framework, which is designed to allow those network practices that serve a public interest purpose and do so in a proportional way that does not create unnecessary harm.

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[214] Whether formally classified or not, for all intents and purposes, interconnected VoIP functions as a Title II service, and should not be considered "managed services" for purposes of constructing a new, distinct regulatory classification. IPTV offerings such as AT&T's U-Verse and Verizon's FiOS should similarly be treated as Title VI services, to the extent any formal regulatory uncertainty exists.

[215] *Notice* at para. 149.

[216] *See Notice* at para. 114 ("Does the separate regulatory category of managed or specialized services allow beneficial discrimination to serve the public?").

The Commission should not lightly permit such services to avoid the essential consumer protections the Commission has proposed to adopt for Internet access services. Given the potential harm to the open Internet, the Commission should refrain from resolution of these issues until more information can be gathered on the nature and impact of such services. As these services remain hypothetical, network operators must be more forthcoming and transparent about their future intentions. After tangible information on the services is gathered, the Commission and the public will be in a better position to evaluate whether a separate regulatory category is appropriate, and whether the category should also be subject to the consumer protections applicable to the open Internet.

Given the undisputed success of the *Computer Inquiry* enhanced-vs.-basic regulatory framework, which is responsible for allowing the open Internet to develop without undue interference from carriers,[217] the Commission would be wise to apply these historical lessons to any future enhanced services offered over broadband telecommunications networks. This regulatory framework applied in the context of new enhanced services will ensure that such services if developed, are developed in a manner that preserves competition and consumer choice. The unbundling requirement also serves as a backstop to ensure that such managed services are not allowed to crowd-out existing Internet access services. As stated above, *Computer II* and *Computer III* remain in place for any non-Internet access enhanced services offered by facilities-based wireline providers, requiring carriers to offer on a common carrier basis the underlying transmission component to any such non-Internet access enhanced service (BOCs have further CEI and ONA obligations). We encourage the Commission to continue to apply such treatment to any new services offered over wireline facilities, and to apply it to those that may be offered in the future over other telecommunications facilities.

The Commission Should Require Clear Disclosure of Both General and Specific Information on Interference with Service

Providers of Internet access service currently disclose little information about active impediments placed on user communications. This lack of transparency generates substantial harm. The Commission's proposed disclosure rule does not go far enough to alleviate it. The Commission should require ongoing disclosure of both high-level information concerning network management practices, geared towards a general audience, as well as detailed information on purposes, methods, and triggers of network management, sufficient to enable third party providers and savvy users to make effective choice and optimal use of the service. At least one service provider has already demonstrated the feasibility of specific technical disclosure, without the need for confidentiality of any of the relevant information.

As with other information concerning service quality, service limitations, and restrictions on usage imposed through terms of service,[218] the Commission should require network operators to provide clear and complete disclosure of any interference with a user's service through network management practices, whether or not these practices violate the rules under consideration in this proceeding or can be characterized as reasonable network management. Internet users assume no interference is occurring with their use of the Internet; thus, network operators bear the burden of providing a quick and easy means for users to learn about any restrictions or limitations, as well as an explanation for why such interference does not violate the Commission's rules. However, service providers generally fail to provide any meaningful information on their network management practices, making it more difficult for users and for the Commission to identify any potential

[217] See *Dismantling Digital Deregulation*, at pp. 30-37.

[218] *See* Comments of Consumer Federation of America, Consumers Union, Free Press, Media Access Project, New America Foundation, and Public Knowledge, CG Docket No. 09-158, CC Docket No. 98-170, WC Docket No. 04-36 (Oct. 13, 2009) (*Consumer Truth-in-Billing Comments*).

violations or to attribute accurately any usage problems to the network operator or to an end node in the communication.[219] The common level and form of disclosure, if it can be fairly called that, is substantial vague and overbroad legalese through the "terms of service," in which network operators reserve the right to engage in a wide variety of harmful and restrictive behavior, much of which may well be illegal.[220] Network providers control most of the relevant information about their networks, and average users (even, often, technically savvy users) have no means to gain awareness of the technology used for network control or deep packet inspection, or detect when it is occurring.[221] Perceived effects on Internet traffic can come from several sources, including the application providers or other networks interconnected with the retail access network. In the absence of proper disclosure, consumers may be left with the false impression that electronic equipment or software is to blame for an altered user experience that is actually caused by the network operator.[222]

Furthermore, consumers have been, and continue to be, harmed by the current lack of transparency surrounding practices that monitor, track, block, or otherwise interfere with their behavior.[223] Without knowing these limitations, consumers are unable to accurately gauge the value of their service and its ability to meet their usage needs, creating not just confusion and harm when the interference later occurs,[224] but also impediments to effective consumer choice of service.[225] Both of these harms deter increasing competition and demand for broadband services, and thus may frustrate the nationwide goal of improving broadband service. The Commission, members of Congress, and consumers have frequently and clearly acknowledged the harms of insufficient disclosure.[226]

The Commission's proposed disclosure rule cannot address these harms; it should be replaced with a broader and more direct disclosure requirement. To remedy these harms, the Notice proposes that disclosure obligations apply to information "reasonably required" in order "to enjoy the protections specified in this part."[227] The precise meanings of "reasonably required" and "enjoy the protections" are unclear and no proposed definitions are offered; as a result, there is little or no indication that any level of detailed information would be mandated by the proposal. It's unclear which, if any, of the consumer protections proposed in this docket *require* disclosure. For example, if a limitation on network usage affects a user, for example by throttling heavy users in times of congestion, even if this limitation can pass muster under the reasonable network management standard, disclosure confers benefits upon a user who receives information on how to avoid throttling through more efficient network usage -- and this benefit bears little or no relation to whether the practice at issue is considered discriminatory, or is permitted under the framework for reasonable network management. The Commission should not attach the requirements of disclosure to other consumer protections, but should craft the disclosure principle as a stand-alone requirement to

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[219] *Notice* at paras. 123-24.

[220] *See* Consumer Truth-in-Billing Comments, *supra* note 222, at Appendix A.

[221] *See, e.g.*, Letter from Marvin Ammori, General Counsel, Free Press, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 07-52, Residual Issues Memorandum at 14, n.43 (June 12, 2008) (describing the complex methods that may allow users to detect provider interference).

[222] *See, e.g.*, Eric Bangeman, "Comcast traffic blocking: even more apps, groupware clients affected," *Ars Technica* (Oct. 21, 2007), *at* http://arstechnica.com/news.ars/post/20071021-comcast-traffic-blocking-even-more-apps-groupware-clients-affected.html.

[223] *Notice* at para. 131; *see generally* Ex Parte Letter of Free Press, WC Docket No. 07-52 (Oct. 24, 2008) (describing the ongoing harms of insufficient disclosure of network management practices, and asking the Commission to require all network operators to provide disclosure similar to the required disclosure of Comcast) (*Free Press Disclosure Letter*).

[224] *Notice* at para. 125.

[225] *Ibid.* at para. 122.

[226] *See* Free Press Disclosure Letter, *supra* note 227, at p. 4-5.

[227] *Ibid.* at para. 119.

disclose technical details of all practices that monitor or interfere with use of the service, along with the conditions that engage and disengage such practices, as well as the specific problem or issue requiring the interference.[228]

The Commission also seeks comment on the proper balance of detail to be provided to consumers.[229] High-level guidance can help promote a broad general understanding of service limitations; however, optimal service usage and policing of bad activity requires much more detailed information. No magic balance point exists that can meet both of these needs. The Commission should therefore require a two-level solution -- prominent disclosure of clear, high-level information, backed by a more robust disclosure of technical details regarding triggers for and methods used in network management practices. The high-level disclosure should present meaningful information about actual service performance in a standardized and easily comparable manner, to enable effective consumer choice and valuation of Internet access services.[230] The high-level disclosure should also present a plain-language version of the limitations applicable to the use of the service, including a general indication of when the network operator will monitor, block, or throttle service usage.[231] The specific disclosure should provide detailed information about the mechanisms of any network management practices that interfere with ordinary usage of the service, including any form of throttling, blocking, or prioritizing of traffic.

The Commission notes that detailed information on network behavior can enable the development of more efficient and more effective content, applications, and services by third parties who offer those services over the network -- the same goals sought by the adoption of CEI and ONA rules in the *Computer Inquiries*.[232] Any such disclosures made to content, application, and service providers should similarly be made available to the public as part of the detailed disclosure mechanism. In the modern Internet, the line dividing "content, application, and service providers" from ordinary users is increasingly disappearing; substantial disclosure of triggers and methods of network management should be provided to any individual who can make use of the information, without any requirements for screening or certification.

Disclosure obligations should be ongoing, and disclosure of changes to network management practices should provide sufficient advance notice to enable users to seek alternative Internet access service providers, should they choose not to accept the changes.[233] Furthermore, users who choose not to accept the changes should be able to leave, without penalty, any ongoing contracts for Internet

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[228] As proposed previously, this disclosure should include: 1) the specific problem or issue requiring the network interference, including evidence to demonstrate the existence of congestion or other problems that mandate interference; 2) any and all limits imposed on or direct changes made to a customer's upstream or downstream traffic, such as blocking traffic, delaying traffic, deprioritizing or prioritizing traffic, reordering traffic, redirecting traffic, discriminating for or against certain traffic, or inserting traffic into the stream; 3) technical details of the methods used; 4) exact details of all thresholds, such as time of day or exact levels of congestion or bandwidth consumption, that trigger any network interference, as well as the effects in the network as a result of the chosen thresholds, such as a general percentage of users affected and the duration of effect for those users; and 5) exact details of thresholds that trigger a cessation of network interference. Free Press Disclosure Letter, *supra* note 227, at p. 12.

[229] *Notice* at para. 126.

[230] *See* Consumer Truth-in-Billing Comments, *supra* note 222. The Open Technology Initiative of the New America Foundation has proposed a standardized "Schumer box" for disclosure of actual performance information. *Ibid.* at Appendix C.

[231] *See, e.g.*, *ibid.* at p. 26-27.

[232] *Notice* at para. 127.

[233] *See Notice* at para. 129.

access service.[234] Internet access service providers should not be permitted to change the material nature of their service and continue to bind users to the new terms.

The Commission also seeks comment on circumstances where disclosure may not be legally possible,[235] or where disclosure would cause harm to network security, online safety, or competition.[236] Network operators should be required to disclose any and all information concerning active interference through network management, unless specifically prohibited from doing so by other laws. The range of limitations imposed by such laws is narrow, and compliance would not undermine the effectiveness of detailed disclosure. Even detailed disclosure of methods and triggers for network management is feasible without introducing danger to network security, online safety, or competition. Comcast made this abundantly clear through substantial disclosures of methods and triggers for both its past and future network management methods, without requesting confidential treatment.[237] In this situation, any potential harms to a provider are far outweighed by the benefits to consumers and the Internet ecosystem as a whole. The Commission has recently strayed from its long-standing principle of applying a presumption in favor of public disclosure.[238] This proceeding presents an opportune moment to return to those roots, so strongly grounded in the public interest.

Apart from disclosure to the public through a website, disclosure directly to the Commission will help promote the effectiveness of disclosure and the other proposed consumer protections.[239] As an initial matter, commenters have provided substantial suggestions on appropriate mandatory disclosure obligations from network operators in a variety of contexts beyond this one, including truth-in-billing[240] and the Commission's annual Form 477 reports,[241] concerning other essential information including the actual performance of data transfer services as well as limitations imposed by the network operator through its terms of service. Disclosure of network management practices and consumer complaints to the Commission, above and beyond these requests, helps the Commission enforce open Internet consumer protections and ensure that consumers receive information needed to make effective use of Internet access service. Disclosure should be made regularly and periodically, and should be updated whenever a material change is made to the disclosed information. The Commission should view this disclosure as an essential component to any commitment to being "data-driven."[242]

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[234] In other contexts, permitting customers to leave service without paying termination fees is commonplace -- though not universally known or understood -- for a period of time after the service provider makes a "materially adverse" change to the conditions of the service contract.

[235] *Notice* at para. 132.

[236] *Ibid.* at para. 130.

[237] *See* Free Press Disclosure Letter, *supra* note 227, at p. 3, 5.

[238] *See, e.g.*, Comments of Free Press, In the Matter of A National Broadband Plan for Our Future, GN Docket No. 09-51, p. 289-304 (June 8, 2009).

[239] *See Notice* at paras. 120, 128.

[240] Consumer Truth-in-Billing Comments, *supra* note 222.

[241] *See* Further Reply Comments of Consumers Union, Consumer Federation of America, and Free Press, In the Matter of *Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data on Interconnected Voice over Internet Protocol (VoIP) Subscribership*, WC Docket No. 07-38, pp. 13-15 (August 1, 2008). *See also* Comments of Free Press, In the Matter of A National Broadband Plan for Our Future, GN Docket No. 09-51, p. 289-304 (June 8, 2009).

[242] *Se, e.g.* Statement of Julius Genachowski, Nominee to Serve as Chairman of the Federal

Communications Commission, Before the U.S. Senate Committee on Commerce, Science, and Transportation, June 16, 2009, p. 3.

The burden imposed on providers for such disclosure should be minimal, and certainly does not outweigh the benefits of direct disclosure.[243] As network operators should provide detailed information on methods and triggers for network management practices to the public, providing the same information directly to the Commission should be trivial.[244] However, as information submitted directly to the Commission carries with it an additional legal obligation of accuracy,[245] the veracity of such information can be more fully and immediately trusted. Similarly, sharing information on consumer complaints about network management practices or insufficient disclosure -- already certainly recorded for internal purposes -- should impose little burden onto network operators. Yet, information on such complaints can help the Commission greatly with effective enforcement of disclosure rules and other consumer protections.

Permitting Reasonable Network Management as an Exception to Disclosure is Unclear and Could Create Harmful Loopholes

The Commission proposes to subject disclosure obligations to reasonable network management.[246] Mentioned briefly, in one paragraph only, the meaning of such an exception is unclear, particularly when the proposed rule is already limited to information "reasonably required."[247] No further explanation is provided in either the section on disclosure, or the section on reasonable network management. In fact, as "reasonable network management" is defined to be a set of practices which are permissible, it is unclear how a rule to disclose behavior would be "subject" to rules on permissibility.

In the most aggressive case, the Commission may be proposing that practices classified as "reasonable network management" need not be disclosed. Such a proposal would seem to render disclosure obligations meaningless -- it would mean, essentially, that the only practices that need be disclosed are those that are illegal, raising the question of why they are being conducted in the first place. Legal behavior may therefore involve no disclosure.

The purpose of disclosure is to inform users as to the behavior of practices that are legal, either because they do not violate other laws or because they are reasonable network management, with sufficient detail for users to understand and know when, why, and how the network management practices are affecting them. Even if narrowly construed, any form of "reasonable network management" exception for disclosure would seem to allow some interfering network practices to go undisclosed. This would make enforcement of the other consumer protection rules nearly impossible -- any practice that is not disclosed cannot be readily challenged by users, as establishing a prima facie case may take months of expert study.

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[243] *See Notice* at para. 126.

[244] Indeed, this would be less burdensome than other information currently collected by the Commission. For instance, FCC Form 320 requires cable operators to report the level of signal leakage occurring within their network, a task that often involves hiring an aircraft to fly over a geographic area. *See* FCC, Media Bureau, Engineering Division, Basic Signal Leakage Performance Report (FORM 320), *at* http://www.fcc.gov/mb/engineering/cli.html.

[245] For instance, the submission of Form 477 requires an officer of the company to sign a certification statement on the accuracy of the information contained within the form under penalty of "fine or imprisonment." *See* "Instructions for Local Telephone Competition and Broadband Reporting Form (FCC Form 477)," FCC, Section IV(C), *at* http://www.fcc.gov/form477/inst.htm.

[246] *Notice* at para. 119.

[247] *Ibid.*

The Commission should not permit "reasonable network management" to serve as an exception to disclosure, and should require clear and complete disclosure of any interference with user control of communications on the Internet.

Wireless Internet is Just an Alternative On-Ramp to the Internet. Net Neutrality Rules Must Apply to All forms of Internet Access

The Commission should require mobile broadband Internet access service providers to permit attachment of any compatible device to their networks, and should ensure that its rule is not rendered meaningless through inefficient, obstructive processes.[248] Permitting open attachment of devices to networks is essential for promoting innovation, competition, and consumer choice in the wireless marketplace, including the separate markets of wireless services and wireless devices. Consequently, an open attachment rule -- if properly administered -- could produce substantial benefits for mobile broadband Internet access service deployment and adoption, as well as encouraging the overall social value of the Internet.

The Commission can best ensure effectiveness of device attachment rules by taking the lead in certifying devices as non-harmful.[249] The Commission already plays a major role in evaluating mobile devices of all forms for interference and other safety and performance thresholds; compliance with fundamental network communication protocols can be developed as an extension of these procedures. Allowing network operators -- who typically sell consumers both devices and service plans, and make substantial profits from the arrangement, in part through the use of excessive early termination fees[250] -- to play a central role in third-party device certification will doom any open attachment rule. Network operators will introduce obstacles and obstructions into the certification of devices that will render compliance possible in theory, but extraordinarily difficult in practice. The Commission has already witnessed this pattern, in fact -- it arose in the market for cable system set-bop boxes.[251] In 1996, Congress directed the Commission to pass rules necessary to create an independent market for the equipment necessary to connect to cable networks and access content,[252] an analogous circumstance to the context at issue here. The Commission's subsequent actions led to the acceptance of the CableCARD standard, which placed control of all steps of the process into the hands of the cable system operators themselves, who stood to gain by frustrating the goals rather than promoting them.[253] The similarity of these contexts is further illustrated by the Commission's query whether "providing wireless modems or SIM cards that could be easily inserted into end-user devices" could suffice as a technical solution.[254] In the cable context, a similar approach proved insufficient, and although technologies and contexts are not identical, the experience should nevertheless counsel hesitation here. The Commission should certify devices as compatible and non-harmful, and the role of network operators should be limited to disclosure of any and all mechanisms necessary for devices to communicate fully with the network.

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[248] *See Notice* at para. 166.

[249] *See id.*

[250] *See, e.g.*, Comments of Consumer Federation of America, Consumers Union, Free Press, Media Access Project, New America Foundation, and Public Knowledge, WT Docket No. 09-66 (June 15, 2009).

[251] *See, e.g.*, Petition for Rulemaking of Public Knowledge, Free Press, Media Access Project, Consumers Union, CCTV Center for Media & Democracy, Open Technology Initiative of New America Foundation (Dec. 18, 2009), *available at* http://www.publicknowledge.org/pdf/pk-etal-petition-20091218.pdf (*STB Petition*).

[252] 47 U.S.C. § 549.

[253] *See* STB Petition, *supra* note 255.

[254] *Notice* at para. 166.

Similarly, the Commission should subject any "procedures" used by network operators to "prevent harm" to a general-purpose standard of reasonable network management, and should not incorporate additional specific exceptions into its device attachment rules.[255] Assuming devices have gone through an independent review process and been deemed non-harmful, further steps by network operators (who have economic incentives to frustrate the process of device attachment) to "prevent harm" should be viewed skeptically. A network operator who seeks to engage in additional network management practices should demonstrate that such practices pass a reasonable network management test -- they should be driven by a public interest purpose (in this context, this should include a specific, evidentiary showing that the device will cause harm absent the practices) and the practices should be temporal, geographic, and proportional actions with respect to that demonstrable purpose.[256]

The Commission should consider tethering to be covered under the rule of nondiscrimination, rather than device attachment.[257] Tethering functions as an application running on a device. A mobile broadband Internet access device such as a smartphone or cellular phone connects to the mobile broadband Internet access service; that connection is covered by the proposed device attachment rule. When that device sends traffic to the Internet access service from an application, even if that application is a tethering application, its traffic should not be blocked or degraded by the Internet access service provider, just like any other application operating on the device. The fact that traffic from a tethering application is received from some other device and passed through the smartphone or cellular should not factor into traffic management. Thus, providers of Internet access service should not be permitted to block tethering, as it is fundamentally indistinguishable from a high-bandwidth application running solely on the device. For the same reason, tethering should not have a substantial impact on congestion, particularly with the increase in use of netbooks connected directly to mobile broadband Internet access services.[258] Reasonable network management should not contain specific exceptions for tethering, for the same reason no specific exceptions should be given for other high-bandwidth applications -- any such practices should be demonstrated to be temporal, geographic, and proportional actions that advance public interest purposes. Device manufacturers can choose to enable tethering or not enable it on their devices; however, network operators should not be permitted to require the device manufacturer to disable tethering as a condition for offering the device and service bundled together.

Finally, assuming devices are certified by the Commission as non-harmful, there is no reason to delay adoption of open device requirements[259] -- once a device is established to be compatible, network operators should permit it to connect to their networks. Provided sufficient information is disclosed by the network operators as to the mechanisms for connection, device manufacturers will perform the work necessary to ensure compatibility, and little or no work should be needed by network operators to make changes to their infrastructure.

The principles and rules of nondiscrimination and reasonable network management can and should be applied directly and immediately to all forms of wireless networks and devices.[260] First, increasingly, bundles of services including voice, video, and Internet access are being offered through fixed connections; there is no clear reason to distinguish wireless solely on the basis of multiple service offerings.[261] Similarly, from the perspective of an Internet access service, there is and should be no

[255] *See ibid.*

[256] *See supra*, Section III. C.

[257] *See Notice* at para. 167.

[258] *See Notice* at para. 167.

[259] *See Notice* at para. 168.

[260] *See Notice* at para. 171.

[261] *Ibid.*

distinction between an iPhone and a laptop -- both are capable of high-bandwidth usage, and both must receive nondiscriminatory network management to protect consumer choice, competition, and innovation in the markets for content, applications, services, and devices. Both iPhones and laptops contribute to network utilization and thus congestion, and reasonable network management to deal with congestion should be permissible, provided the methods used are targeted to the times and places of congestion, and do not involve disproportional restrictions on use of the Internet access service.

The Commission should not categorically apply different treatment to mobile broadband Internet access service. Certainly, some characteristics of mobile broadband networks, including spectrum usage and problems introduced by mobility, vary from fixed networks.[262] But not all fixed networks operate alike, and some have far different performance characteristics and limitations than others. The shared nature of the cable plant introduces problems distinct from the more limited, but unshared DSL line, itself distinct from the relatively powerful FTTH connection. The purpose of a reasonable network management framework is to handle all of these distinctions, and to evaluate proportional responses to the demonstrable problems in the network. To the extent that many mobile broadband networks face demonstrably greater challenges than many fixed networks, the range of options considered proportional in response to these challenges will be greater. Any alternative approach, particularly a categorical permission to block high-bandwidth applications or to block low-bandwidth VoIP or other uses,[263] would permit substantial anti-competitive (and anti-consumer) behavior -- and is simply unnecessary.

The Commission further seeks comment on the nature of application usage on a device, as compared to "in the cloud."[264] Certainly, numerous technical details could create differences in the user experience between on-device and remote application usage. Fundamental to the concept of nondiscrimination and device attachment policy, for both fixed and mobile broadband networks, is that network operators should not be permitted to exercise control over the devices and applications used on an Internet access service. Consistent with this, the Commission should remain skeptical of any actions by providers of mobile broadband Internet access service to restrict the use of applications on devices, as such actions likely mask (or, less commonly, admittedly are[265]) anti-competitive and anti-consumer behaviors that undermine the goals of this proceeding.

The Fourth Principle -- Competition

The Notice seeks comment specifically on the need to codify the fourth principle as a rule.[266] Although the other principles if properly codified can protect consumers from a broad range of specific and cognizable harms, the fourth principle serves as an essential safety valve on top of these provisions. The fourth principle can protect users from harmful, anticompetitive activity by Internet access service providers that undermines the ability of the Internet to serve as a free market for application, service, and content providers, or activity that undermines competition in the market for Internet access services. Consumers would benefit from direct Commission protection against anticompetitive activity through a codified fourth principle, as the relationship between antitrust

[262] *Notice* at para. 172.

[263] *See Notice* at para. 173.

[264] *See Notice* at para. 174.

[265] *See* Leslie Cauley, "Skype's iPhone limits irk some consumer advocates," *USA Today* (Apr. 2, 2009), *available at* http://www.usatoday.com/tech/news/2009-04-01-att-skype-iphone_N.htm ("'We absolutely expect our vendors' — Apple, in this case — 'not to facilitate the services of our competitors,' [AT&T executive Jim Cicconi] says.").

[266] *Notice* at para. 102.

enforcement and the activities of Internet access service providers has remained somewhat nebulous in light of recent Supreme Court cases.[267]

Scope and Applicability of the Open Internet Policy

In the *Notice* the Commission sought comment on the geographic scope[268] and applicability of the open Internet policy framework to non-ISPs.[269]

The Commission correctly defines the geographic scope of the proposed rules in the *Notice.* They should apply to broadband Internet access services, on the portion of an ISPs network that serves the end-user up to the Internet exchange point.

This is straightforward, and the Commission should not give any credence to the strawmen offered by AT&T that this rule would a) ban Content Delivery Networks (CDNs) or b) ban the use of special access circuits.[270] Put mildly, this claim is ignorant of basic facts, and the author certainly knows as much. One might conclude that such behavior indicates that AT&T believes the Commission is a bunch of rubes.

First, as AT&T knows quite well, CDN services give cached content "priority" over all other content as a matter of geography and physics (the speed of light). Nothing at all in the proposed rule would prohibt CDNs and local caching services; indeed, such services are a more cost-effective and non-discriminatory way of achieving improved QoS on certain types of content.

Second, as AT&T also knows quite well, the proposed rules in the *Notice* would not in any way impact enterprise services, as such services are not broadband Internet access services (as defined by the Commission), and are in fact still subject to Title-II regulation.[271]

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[267] Most notably, the Supreme Court's decision in *Trinko* struck down antitrust claims regarding access to telecommunications facilities, sending signals that antitrust law was inappropriate for such questions. *Verizon Communications, Inc. v. Law Offices of Curtis V. Trinko*, LLP, 540 U.S. 398 (2004).

[268] *Notice* at 107.

[269] *Notice* at 101.

[270] As this letter shows, there should be no doubt that AT&T is unrivaled in its ability to build up then beat down strawmen. *See* Letter from James W. Cicconi, Senior Executive Vice President for External and Legislative Affairs at AT&T, to Chairman Julius Genachowski, January 12, 2009. "The absolute nondiscrimination requirement sought by Free Press… would render unlawful a host of services offered today; [services such as] Edge caching. Some ISPs offer content and application providers the ability to cache content on servers located within the ISP network. Such content receives "enhanced" performance as compared to content hosted in more distant locations, but this enhancement is beneficial both to the content providers and the ISP's end users. [the nondiscrimination rule could also render unlawful] Internet Access with class of service capabilities. ISPs currently provide enterprise customers (including content and application providers) the option (for a fee) o f separating their traffic into various classes o f service, such as real-time, high-priority data, and best effort.

[271] TDM-based DS-1 and DS-3 circuits are still subject to extensive special access Title-II regulations. All other enterprise services are subject to less regulation, but still under Title-II. None of these services are "broadband Internet access services" subject to the proposed rules in the instant proceeding. *See "*Verizon Telephone Companies' Petition for Forbearance from Title II and *Computer Inquiry* Rules with Respect to their Broadband Services Is Granted by Operation of Law," WC Docket No. 04-440, News Release (rel. March 20, 2006). See also *Petition of the Verizon Telephone Companies for Forbearance*, WC Docket No. 04- 440 (filed Dec. 20, 2004) (*Verizon Enterprise Forbearance Petition*). See also *Petition of AT&T Inc. for Forbearance Under 47 U.S.C. § 160(c) from Title II and Computer Inquiry Rules with Respect to Its Broadband Services, Petition of BellSouth Corporation for Forbearance Under 47 U.S.C. § 160(c) from Title II and Computer Inquiry Rules with Respect to Its Broadband Services*, WC Docket No. 06-125, Memorandum Opinion and Order, 22 FCC Rcd 18705 (2007) (*AT&T Enterprise Forbearance Order*); See also *Qwest Petition for Forbearance Under 47 U.S.C. §160(c) from Title II and Computer Inquiry Rules with Respect to Broadband Services*, WC Docket No. 06-125, Memorandum Opinion and Order, 23 FCC Rcd 12260 (2008) (*Qwest Enterprise Forbearance Order*). In the 2004 *Triennial Review Order on Remand,* the FCC forbeared OCn, Ethernet, SONET, ATM, Frame Relay, and other high-capacity

Another diversionary argument raised by AT&T is the need for these rules, if applied to ISPs, to apply to content providers. The Commission should ignore this pleading, as it flies in the face of 40 years of successful Internet regulatory policy, and flies in the face of the Intent of Congress as expressed in Section 230b for the competitive Internet (not the telecommunications companies who provide Internet access services provisioned over telecommunications facilities) to remain unregulated.

There is a widely held belief, particularly among D.C. policymakers and corporate lobbyists, that the Internet "has never been regulated."[272] In reality, the FCC has imposed substantial regulations on part of the Internet[273] since its infancy to ensure that it would be able to grow and flourish into a competitive marketplace.[274] This is the distinction the Commission must recognize when evaluating AT&T's pleas to apply regulations meant for facilities-based providers to pure content companies like Facebook and Twitter.

In 1966, the FCC sought comment on the question of whether computer information and other data processing services should be subjected to FCC authority under the provisions of the Communications Act.[275] From this inquiry, the Commission concluded that the data-processing industry was competitive, had low barriers to entry, and should not be regulated.[276] But the Commission also found that the emerging data processing market was wholly dependent on access to AT&T's infrastructure,[277] and that the phone company had substantial incentive to act in an anti-

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lines from dominant carrier regulation. These services were never subject to UNE-P, just dominant carrier tariffing regulations, and *Computer III* CEI and ONA unbundling requirements. In the Enterprise Forbearance Orders, these services remained under all Title-II regulations, but only as they applied to non-dominant carriers. In other words, the tariffing requirements were largely eliminated, but the reasonable interconnection and pricing requirements of sections 201 and 202 still apply, and complaints alleging violations of these requirements may be filed pursuant to Section 208.

[272] Opponents of Network Neutrality heavily pushed this notion during the debates surrounding major telecom legislation in Congress during 2006. Some industry claims were particularly galling. For example, a wildly dishonest advertisement from the industry front group "Hands Off The Internet" stated that nondiscrimination protections on the Internet would be "the first major government regulation of the Internet, and will change how the Internet works."

[273] The Internet is, in its most simple abstraction, a global system of interconnected computers -- a system with two basic parts, separable by two broadly distinct markets: the computer market and the market for the communications infrastructure that connects the computers.

[274] The first two nodes of what would become ARPANET – the predecessor of today's Internet -- were connected in October 1969. The Commission began the first "Computer Inquiry" in 1966 and issued a tentative decision in 1970. R*egulatory and Policy Problems Presented by the Interdependence of Computer and Communication Services and Facilities*, Docket No. 16979, Notice of Inquiry, 7 FCC 2d 11 (1966) (*Computer I NOI*). See also *Regulatory and Policy Problems Presented by the Interdependence of Computer and Communications Services*, Tentative Decision by the Commission, 28 FCC2d 291, (1970) (*Computer I Tentative Decision*).

[275] *Computer I NOI*, para. 15-18.

[276] *Ibid,* paragraphs 19-23, which states in part, "There is ample evidence that data processing services of all kinds are becoming available in larger volume and that there are no natural or economic barriers to free entry into the market for these services."

[277] In discussing this history, we will often refer to the monopoly phone "company" in the singular. This is a simplification. AT&T was by far the dominant local and long-distance phone company in the United States prior to its court-ordered breakup, but there were other local monopoly carriers in certain areas (the largest being GTE, which was eventually acquired by Verizon), including many small local telephone cooperatives, some of which continue to operate today.

competitive manner.[278] So the FCC separated the competitive market from the uncompetitive market by imposing a set of highly regulatory safeguards known as "Maximum Separation."[279]

Under this structural separation, the phone company was only allowed to enter the data processing market if it established a completely separate corporate entity with separate facilities, equipment and personnel (including corporate officers). And the separate computing affiliate was not allowed to own its own communications transmission infrastructure; it had to purchase it from the parent company on the same publicly published terms and conditions available to all other data processing companies.[280]

The *Computer I* decision separated pure data processing services from pure communications transmission services. But there were some functions that did not fit so neatly into these separate bins, and the Commission ruled that it would deal with the regulatory status of these "hybrid services" on a case-by-case basis.[281] But this ad-hoc approach to decisions about hybrid services introduced too much uncertainty into the market, and the Commission quickly realized that it needed a better approach. So in 1976, it began its second *Computer Inquiry*.[282]

To resolve the problems of uncertainty inherent to the "pure communications," "pure data processing" and "hybrid service" classification system, the Commission opted for a binary approach. Services were now considered either "basic" or "enhanced." This was a much more elegant and workable solution, as it established a clear dividing line between "common carrier transmission services from those computer services which depend on common carrier services in the transmission of information."[283] Basically, this meant that the Commission would consider any service offered over the network that was more than a basic transmission service to be an enhanced service. So dial-up Internet access service would be an enhanced service, but the "Plain Old Telephone Service," or POTS, that provided dial-up's transmission path was a basic service.

In the *Computer II Decision* of 1980, the FCC maintained the "Maximum Separation"

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[278] *Regulatory and Policy Problems Presented by the Interdependence of Computer and Communication Services and Facilities*, Docket No. 16979, Final Decision and Order, 28 FCC 2d 267 (1971) (*Computer I Final Decision*) at para. 7, which stated, in part, "There is a close and intimate relationship between data processing and communications services and that this interdependence will continue to increase. In fact, it is clear that data processing cannot survive, much less develop further, except through reliance upon and use of communication facilities and services."

[279] *Computer I Final Decision* at para. 10.

[280] *Computer I Final Decision*, para. 229. Maximum separation was only applied to carriers with annual operating revenues exceeding $1 million, so many of the smallest rural independent companies were not subject to these conditions. However, all common carriers under Title II of the Act were required to offer their services on a reasonable and nondiscriminatory basis.

[281] At the time, the Commission defined hybrid services as "an offering of service which combines remote access data processing and message-switching to form a single integrated service." Pure data processing was considered to occur at the edges of the network, defined by the Commission as the "use of a computer for the processing of information as distinguished from circuit or message-switching. 'Processing' involves the use of the computer for operations which include, inter alia, the functions of storing, retrieving, sorting, merging and calculating data, according to programmed instructions." In contrast, pure communications was a transmission service where the content of the message is transmitted over the network without a change in content or form of the message. See *Computer I Tentative Decision*, para. 15.

[282] *Amendment of Section 64.702 of the Commission's Rules and Regulations*, Notice of Inquiry and Proposed Rulemaking, 61 FCC 2d 103 (1976) (*Computer II Notice of Inquiry*).

[283] Basic services were defined as those offering "a pure transmission capability over a communications path that is virtually transparent in terms of its interaction with customer-supplied information." The Commission considered enhanced services to be those that combine "basic service with computer processing applications that act on the format, content, code, protocol or similar aspects of the subscriber's transmitted information, or provide the subscriber additional, different, or restructured information, or involve subscriber interaction with stored information." See *Amendment of Section 64.702 of the Commission's Rules and Regulations (Computer II)*, 77 FCC 2d 384 (1980) (*Computer II Final Decision*), para. 86.

requirements from the first inquiry, but only on AT&T.[284] The FCC also continued to require the phone companies to provide the basic transmission services underlying their own enhanced services on a nondiscriminatory basis. Thus all enhanced service providers were able to purchase the basic transmission services at the same prices, terms and conditions that the phone company charged its own subsidiaries.

In enacting the 1996 Telecom Act, a piece of legislation that started to take shape in the early 1990s, Congress intended for the FCC to implement a regulatory structure that would usher in a new era of competition and innovation in the local telephone, long-distance and Internet access markets.[285] The basic conceptual framework of the *Computer Inquiries* became the starting point for Congress' efforts to legislate competition into the broader communications marketplace. In the 1996 Act, Congress largely codified the basic concepts of "enhanced" versus "basic" services present in the *Computer II* rules.[286]

The impact of these proceedings cannot be understated. They created an open communications platform that served as the basis for much of the economic and social growth seen in America during the past two decades.[287] In asking the Commission to regulate content providers, AT&T would propose to regulate an industry that has by design, been walled off from regulation and protected from the market power of incumbents for most of the time the Internet has existed. This is a radical request to say the least. There may be a future need for regulators, be they the FCC, FTC, or DOJ, to protect consumers from abuses of market power by Internet content companies. But such concerns are beyond the scope of this proceeding.

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[284] *Ibid.*, para. 216. The Commission also ruled that this separation was necessary to protect the public from "monopoly telephone companies exercising significant market power on a broad geographic basis." *Ibid.*, para. 261.

[285] This is even evident from a cursory look at previous iterations of The Act or the accompanying reports. For instance, the report accompanying the Communications Act of 1994, states, "Subsection (c) of new section 230 sets forth the basic obligations of all telecommunications carriers to open and unbundle their networks in order to permit competition to develop. All telecommunications carriers shall be deemed common carriers, which makes them subject to Title II of the 1934 Act." (*See* Senate Report 103-367). *See also* "Speech of Vice President Al Gore, before the Television Academy, UCLA, June 11, 1994 ("Preserving the free flow of information requires open access, our third basic principle…Accordingly, our legislative package will contain provisions designed to ensure that each telephone carrier's networks will be readily accessible to other users. We will create an affirmative obligation to interconnect and to afford nondiscriminatory access to network facilities, services, functions and information.")

[286] But they didn't *exactly* codify them, and this has been the source of much debate over the past dozen years. The 1996 Act describes four types of services that are of importance to the regulatory debate over broadband: "information service," "telecommunications service," "telecommunications," and "cable service." In defining these terms, Congress built upon the language of the court ruling that broke up Ma Bell and the Commission's work in the *Computer II* proceeding. The Commission later clarified that "information services" and "telecommunications services" were mutually exclusive, mirroring the *Computer II* "enhanced" versus "basic" services dichotomy. *See Federal-State Joint Board on Universal Service*, CC Docket No. 96-45, Report to Congress, 13 FCC Rcd 11501, 11516-17, 11520, 11524, paras. 33, 39, 45-46 (1998).

[287] For the definitive history on the *Computer Inquiries*, See Robert Cannon, "The Legacy of the Federal Communications Commission's Computer Inquiries," *Federal Communications Law Journal*, 55, 167 (2003).

A Network Neutrality Non-Discrimination Principle Would Promote First Amendment Values

In the *Notice* the FCC requests comment on the impact of a nondiscrimination rule on free speech, civic participation, and democratic engagement.[288] In particular, it asks whether discrimination by access providers would interfere with those goals, and also whether a non-discrimination rule "would impose any burdens on access providers' speech that would be cognizable for purposes of the First Amendment."[289]

A network non-discrimination principle would provide a speech-enhancing effect by preserving unfettered access for, and to, diverse content and applications on the Internet. In keeping with this speech-enhancing effect, a non-discrimination principle would not infringe on the free speech rights of cable and phone companies. While companies that provide Internet access do benefit from the First Amendment when they function as speakers, they may not invoke First Amendment protections for practices, such as Internet traffic management, that do not constitute speech.

The Internet has already demonstrated its potential as one of the great democratizing forces of our time. Due in large part to its two-way nature and comparatively low barriers to participation, the Internet enables users to engage, create, and participate as speakers -- not merely as passive recipients of others' speech. Indeed, it is no exaggeration to say that the Internet has become an essential vehicle for speech in the 21st century.

Most importantly the Internet provides a critical platform for innovation and diverse voices. This is particularly true for new entrants and underrepresented groups, such as women and people of color, who historically have lacked access to the resources that make participation on traditional media platforms possible. The variety and range of speakers and viewpoints available online is self-evident. Moreover, a recent FCC panel entitled "Speech, Democratic Engagement, and the Open Internet" highlighted the value of the Internet in spurring political participation and creation of cultural content.[290] There the panelists, many of them women and people of color, testified to the importance of an open Internet on their ability to engage in community and political mobilization, to start a new business providing video programming to underserved audiences, and to create community-responsive content that defies stereotypes often prevalent in media.[291]

Conversely, the comparative failure of traditional media to provide outlets for speakers and audiences of color is plain on its face. And if this were not obvious, there are a slew of FCC proceedings, spanning decades, which have recorded this inequity.[292] In each case a promising new

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[288] *Notice* at para. 116

[289] *Notice* at para.116.

[290] FCC Public Notice, "Panelists Announced for Dec. 15 Workshop on Speech, Democratic Engagement, and the Open Internet," (rel. Dec. 11, 2009) *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-295174A1.pdf.

[291] [291] *See, e.g.*, Testimony of Ruth Livier, Ruther Livier Productions, In the Matter of *Broadband Industry Practices, Preserving the Open Internet,* WC Docket No. 07-52, GN Docket No. 09-191 (filed Dec. 22, 2009), *available* at http://fjallfoss.fcc.gov/ecfs/document/view?id=7020354742; Statement of Michelle Combs, Christian Coalition, In the Matter of *Broadband Industry Practices, Preserving the Open Internet,* WC Docket No. 07-52, GN Docket No. 09-191 (filed Dec. 22, 2009) *available at* http://fjallfoss.fcc.gov/ecfs/document/view?id=7020354747; Statement of Garlin Gilchrist, In the Matter of *Broadband Industry Practices, Preserving the Open Internet,* WC Docket No. 07-52, GN Docket No. 09-191 (filed Dec. 22, 2009), *available at* http://fjallfoss.fcc.gov/ecfs/document/view?id=7020355478.

[292] *See, e.g., Statement of Policy on Minority Ownership of Broadcast Facilities*, Public Notice, 68 FCC 2d 979 (1978) (formalizing the sue of minority merits in the comparative hearing process, and adopting a minority tax certificate program and distress sale policy); *Reexamination of the Commission's Comparative Licensing, Distress Sales and Tax Certificate Policies Premised on Racial Ethnic or Gender Classification,* Order, 3 FCC Rcd. 766 (1988); *Policies and Rules Regarding Minority and Female Ownership of Mass Media Facilities*, Notice of Proposed Rulemaking, 10 FCC Rcd. 2788 (1994) (initiating a proceeding to examine way to increase opportunities for women and minorities to enter mass media, including broadcast, cable, wireless

mass media form– broadcast radio, broadcast television, and cable television – failed to decentralize control over the platform, permitting powerful gatekeepers to control access, largely excluding women and minorities from ownership and participation. A free and open Internet, coupled with meaningful measures to spur the build-out and adoption of broadband Internet infrastructure, represent a new and promising remedy to this protracted challenge. However, if non-discriminatory access to, and provision of, content online is not protected, the Internet will be relegated to the same fate and format as those media from which underrepresented citizens have been shutout for decades.

In issuing the *Comcast Network Management Practices Order*, the FCC determined that prohibiting Comcast from blocking the legal and non-harmful content and applications of its customers did not violate the First Amendment rights of Internet access providers by limiting their ability to speak or by compelling them to speak.[293] Nevertheless, in a recent a statement, the head of the National Cable and Telecommunications Association (NCTA) suggested that network neutrality rules would violate the First Amendment by compelling speech by Internet access providers and by interfering with providers' editorial discretion in determining how Internet content and applications reach end users.[294] As the FCC has already established, this position is not only incorrect as a matter of fact, but also as a matter of law. Further, to the extent that network operators suggest that they may exercise editorial control over content on the Internet, this contradicts past industry statements and raises grave concerns over the ability to chill valuable and legitimate speech online.

First, it is well acknowledged that the First Amendment protection extends "only to conduct that is inherently expressive."[295] While cable and phone companies do engage in inherently expressive conduct on the Internet -- for example, using their company websites to publish statements voicing their opposition to the adoption of network neutrality rules --maintenance of online traffic does not constitute conduct rising to the level of speech. While network operators provide access to a system that hosts the content and applications of others, the mere act of routing data packets is not itself inherently expressive. In other words, it does not convey an idea or profess opinion or viewpoint. Nor does the fact that network management involves the transfer of "content" convert such management

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cable, and low power television); *Section 257 Proceeding to Identify and Eliminate Market Entry Barriers for Small Businesses*, Notice of Inquiry, 11 FCC Rcd. 6280 (1996) (implementing Section 257 of the Telecommunications Act of 1996 requirements to identify and remove barriers to entry in provision and ownership of telecommunications services, and to promote policies favoring a diversity of media voices); *Promoting Diversification of Ownership In The Broadcast Services*, Report and Order and Third Further Notice of Proposed Rulemaking, 23 FCC Rcd. 5922 (2007) (adopting a ban on non-discrimination in broadcast transactions and advertising sales contracts, but failing to adopt any remedies tied to race- or gender-based preferences).

[293] *See Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices; Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management,"* Memorandum Opinion and Order, 23 FCC Rcd 13028, fn 203 (2008) (*Comcast Network Management Practices Order*) ("As described in more detail elsewhere, we find that Comcast may not, consistent with this purpose, interfere with its customers' use of peer-to-peer networking applications in the manner at issue here. This prohibition does not prevent Comcast from communicating with its customers or others. Nor do we find Time Warner Cable's analogy of a broadband provider to a newspaper to be apt. *See, e.g.*, Time Warner Cable Comments at 27 (arguing that broadband providers have the same First Amendment rights as newspapers and that prohibiting Comcast from interfering with its customers' connections, the Commission would be compelling Comcast to speak). For one, the Commission is not dictating the content of any speech. Nor are we persuaded that Comcast's customers would attribute the content delivered by peer-to peer applications to Comcast, rather than attributing them to the other parties with whom they have chosen to interact through those applications. Under these circumstances, we find that our actions do not raise First Amendment concerns.").

[294] *See* Remarks of Kyle McSlarrow**,** President & CEO, National Cable & Telecommunications Association before the Media Institute: "Net Neutrality: First Amendment Rhetoric in Search of the Constitution," Dec. 9, 2009, *available at* http://www.ncta.com/PublicationType/Speech/Net-Neutrality-First-Amendment-Rhetoric-in-Search-of-the-Constitution.aspx.

[295] *Rumsfeld v. Forum for Academic and Institutional Rights,* 547 U.S. 47, 62 (2006) (citing *Gibony v. Empire Storage & Ice Co.*, 336 U.S. 490, 502 (1949)).

into speech. As the Supreme Court has noted, "it has never been deemed an abridgment of freedom of speech or press to make a course of conduct illegal merely because the conduct was in part initiated, evidenced or carried out by means of language, either spoke, written, or printed."[296]

A non-discrimination principle would neither limit what Internet access providers say, nor require them to say anything. Instead, a non-discrimination principle affects what Internet access providers must do or refrain from doing in order to provide non-discriminatory treatment of data flowing over a network. Thus, because a non-discrimination principle would only target the non-expressive conduct of network management and not speech, such a regulation would not violate the First Amendment.

Similarly, Internet access providers cannot credibly claim that a non-discrimination principle compels them to speak. Maintenance of online traffic is not speech; likewise, a rule ensuring that Internet access providers treat all data equally does not somehow force an operator to speak, nor to endorse particular applications, content, or viewpoints. Compelled speech violations are found only when "the complaining speaker's own message was affected by the speech it was forced to accommodate."[297] Prohibiting Internet access providers from discriminating against the legal, non-harmful content and applications of others in no way affects the messages of phone and cable companies. Allowing Internet users to access the content of their choice does not prohibit cable and telephone companies from expressing their views, nor does it force them to endorse messages with which they disagree.

Finally, the FCC should treat any claims that a non-discrimination principle would violate Internet access providers' editorial discretion with suspicion. For example, in comments submitted in response to Free Press's petition for declaratory ruling on Comcast's network management practices, Time Warner Cable claimed that net neutrality regulation would "run afoul of the First Amendment" because

> "broadband providers, like newspaper publishers or cable operators, are protected speakers entitled to editorial discretion under the First Amendment. A broadband network is "more than a passive receptacle or conduit for news, comment, and advertising;" rather, decisions with respect to the manner in which capacity may be used — the equivalent of "size and content" decisions in the newspaper context — "constitute the exercise of editorial control and judgment" which cannot be subjected to governmental interference."[298]

Any renewal of such arguments should be viewed with skepticism.

As a threshold matter, equating the editorial discretion of newspapers with the network management techniques purported to be used by network operators is unsupported by facts and law. Unlike the selection of articles and other content in a newspaper, the routing of data over networks is conduct -- not speech. Newspaper publishers pay for and choose which content and viewpoints will be printed in their periodicals. Conversely, Internet access providers do not exercise any discretion over the opinions and subject matter contained in websites accessed or emails sent by Internet users. To the

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[296] *Gibony v. Empire Storage & Ice Co.*, 336 U.S. 490, 502 (1949).

[297] *Rumsfeld v. Forum for Academic and Institutional Rights*, 547 U.S. 47, 49 (2006) (comparing the Solomon Amendment's regulation of conduct with the true compelled speech violations in *Hurley v. Irish-American Gay, Lesbian and Bisexual Group of Boston, Inc.*, 515 U.S. 557 (1995)).

[298] *Comments of Time Warner in Response to Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management,"* WC Dkt. 07-52 (filed Feb. 13, 2008) at 26-27 (internal citations omitted).

contrary, members of phone and cable industry consistently have argued that network neutrality regulations are a "solution in search of a problem" because Internet access providers have no interest in monitoring or censoring the online speech of others.[299]

Additionally, editorial discretion entails not only the exertion of a high level of content-based decision-making, but, correspondingly, responsibility -- responsibility, which operators have expressly disavowed for the purpose of avoiding liability for tortious conduct, such as copyright infringement, occurring on their networks.[300] Internet access providers cannot have it both ways. They cannot assert editorial discretion in order to claim the benefits of First Amendment protection for their network management practices while simultaneously denying it to avoid legal responsibility for illegal conduct occurring on network.[301]

To conclude, notwithstanding industry's flawed constitutional arguments, the adoption of a non-discrimination principle would not intrude on the First Amendment rights of network operators. Any arguments suggesting that net neutrality regulations would interfere companies' ability exercise editorial control over the content that they transmit over the Internet not only contradicts past industry statements, but also highlights the need for non-discrimination rules in order to protect users from censorship by network operators. Most importantly, a non-discrimination rule is essential to preserving the open nature of the Internet that has proven so critical to the free dissemination of diverse content and viewpoints online.

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[299] This cable catchphrase was recently reiterated by Comcast's Executive Vice President upon the announcement of this very rulemaking. *See* "Does the Internet Need More Regulation? FCC to Decide," *Comcast Voices,* Sept. 21, 2009, *available at* http://blog.comcast.com/2009/09/does-the-internet-need-more-regulation-fcc-to-decide.html.

[300] For example, under the Digital Millennium Copyright Act, an Internet service provider is immunized from liability of the infringing conduct of its customers, so long as it does not exert control, selection or modification of the content it transmits. *See* 17 U.S.C. §512.

[301] To the extent that when it says "editorial control," industry really means the ability to enter into pay-for-play business schemes that offer preferential treatment to those who can afford it, those arrangements cannot be sheltered under the First Amendment. If every anti-competitive business decision could be couched as an exercise of free speech, this country's antitrust enforcement capacity would be poor indeed. As Yale law professor Jack Balkin has so aptly put it, "the First Amendment protects speech, not business models." Jack M. Balkin, "The Internet's Greatest Gift," SavetheInternet.com (Dec. 16, 2009) *available at* http://www.savetheinternet.com/blog/09/12/16/internets-greatest-gift-participation.