

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, DC**

In the Matter of)	
)	
Preserving the Open Internet)	GN Docket No. 09-191
)	
Broadband Industry Practices)	WC Docket No. 07-52

**COMMENTS OF THE
ASSOCIATION FOR COMPETITIVE TECHNOLOGY**

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I. SUMMARY AND INTRODUCTION

The Association for Competitive Technology hereby submits these comments in response to the Commission's Notice of Proposed Rulemaking (NPRM), GN Docket No. 09-191 and WC Docket No. 07-52.

We agree with much of what the Commission proposes in the NPRM. Developers of software and providers of IT services rely on competition and unrestricted user access to content, applications, and devices. These principles have effectively served Internet communications policy for the past six years, since they were first articulated by the Commission.¹

ACT fully supports the four principles and believes they represent pro-consumer, and pro-innovator policies. The NPRM proposes to formally adopt the original four principles, and at the same time add two new rules on nondiscrimination and transparency. These new additions are well intentioned but their adoption may unintentionally harm the ability of developers to create new applications and IT services that use wireline and wireless Internet communications.

The Association for Competitive Technology welcomes this opportunity to comment on behalf of our over 3,000 small and medium-sized software developer members. While there are many issues raised by the NPRM that warrant attention, ACT believes there are four critical points that the Commission must consider:

- In the NPRM, the Commission recognizes crucial priorities for the Internet and applications developers, but in an effort to prevent abuses by carriers of Internet traffic, the NPRM engages in "prior restraint" rather than limiting its rules to punishing actual anticompetitive activity. While the FCC should be vigilant to abuses of market dominance, it should err on the side of freedom, rather than restriction.

¹ http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-243556A1.pdf

- Application developers often use a business model that includes a free product as well as a “premium product.” This differentiation tool is especially important in the booming mobile applications market. Removing this option harms small developers.
- The exemptions outlined in paragraph 108 defining certain services as “managed or specialized services” should not be buried as loopholes, but rather promoted as the kinds of enhanced services the FCC wants to encourage, including through the use of price discrimination and partnerships with third party application developers.
- The NPRM’s recommendation that companies seek a “declaratory ruling”² prior to releasing an application will be disproportionately costly and time-consuming to small and medium sized companies. Innovative companies may choose not to release products rather than spend money hiring specialized counsel.

II. ABOUT THE ASSOCIATION FOR COMPETITIVE TECHNOLOGY

The Association for Competitive Technology (ACT) is an international advocacy and education organization for developers of software applications and IT services. We represent over 3,000 small and mid-size IT firms throughout the world and advocate for public policies that help our members leverage their intellectual assets to raise capital, create jobs and innovate.

Our community leaders are not political spokesmen—they are engineers. The workings of the Federal Communications Commission are mostly foreign to software developers—but this NPRM is a notable exception. ACT draws upon its membership’s technical expertise and business concerns to inspire and inform its comments.

ACT was started by a small group of information technology entrepreneurs who felt their interests were not being represented in government. Today, ACT is still run by entrepreneurs from the industry who intimately understand how the regulatory environment affects business decision-making and strategy,

² NPRM at pg 49 Note 134

III. INTERNET COMMUNICATIONS ARE VITAL TO THE SUCCESS OF SOFTWARE AND IT FIRMS

Internet communications infrastructure is now a vital part of the software and IT ecosystem. Application developers design and distribute software for the Internet because that's where their customers are.

According to a study by the Global Information Industry Center at the University of California in San Diego, 226 million Americans use the Internet to send email and web browse – and spend 66 hours a month doing so.³ 95 million consumers use the Internet to access such sites as YouTube and Hulu, or rely on products such as Apple TV for video content.⁴ The total amount of information consumed [was almost nine exabytes (one billion gigabytes). In addition, Verizon has reported that its network delivers on a daily basis:⁵

- 1.7 billion text messages
- 50 million video/pictures
- 400 million e-mails
- 8.7 petabytes of video streamed—the equivalent of 4 million full-length movies

Software developers are the ones who write the applications that allow users to consume data online. But today's online applications can be best characterized as passive participants. Software developers rely on the best efforts of network infrastructure to deliver their applications and content. Larger companies with high-traffic websites may contract with companies like Akamai to locate data physically closer to users so that websites or downloads occur more quickly. Faster, however, does not equal more innovative.

Instead, ACT envisions the future as one of *active opportunity* for software innovation. As the creators of what is perhaps the most innovative part of the economy, software

³ http://hmi.ucsd.edu/pdf/HMI_2009_ConsumerReport_Dec9_2009.pdf

⁴ Ibid.

⁵ <http://policyblog.verizon.com/BlogPost/684/HowtoMeasureConsumerConsumptionofInformation.aspx>

developers believe that innovation knows no boundaries. Innovations can occur throughout the Internet's network of networks, and not just at its edge.

But ACT's members are not interested in innovation just for innovation's sake. Small IT companies want flexibility in business models for delivering innovative content, applications and services. Software continues to increase in complexity and increasingly uses plug-ins, add-ons, and third party features. In order to deliver high definition video, voice, or mission critical applications, developers and IT service providers will need to work with communication network providers to maximize usability, speed and convenience to their users.

The FCC's rules should not be crafted around the fear of a few possible abuses, when instead they could provide incentive for thousands of developers of software applications to create and market their products to users within networks that will benefit developers, carriers and consumers alike.

IV. SOFTWARE INNOVATION WILL SUFFER BECAUSE “NONDISCRIMINATORY” IS OVERBROAD, “REASONABLE NETWORK MANAGEMENT” IS UNDERINCLUSIVE, AND “MANAGED OR SPECIALIZED” SERVICES IS OVERLY VAGUE

ACT is concerned about the Commission's proposal to create and codify a principle of nondiscrimination because the key terms that will restrict or allow certain practices are either overbroad, underinclusive, or too vague. The definition of “nondiscrimination” is overbroad because it prevents socially beneficial quality of service (QoS) and prioritization techniques. On the other hand, the exception for “reasonable network management” is too narrow because it would not apply to many QoS and prioritization practices. While the exemption for “managed or specialized services” could apply to certain implementations of QoS and prioritization, substantial legal uncertainty and steep costs would make it difficult for most software developers and IT firms to obtain declaratory judgments. Finally, we believe that the Commission should be focused on anticompetitive conduct in the marketplace—*competitor* discrimination—, not *packet* discrimination.

A. The Nondiscrimination Rule Prevents Welfare-Enhancing QoS and Prioritization of Software and IT Services

The nondiscrimination rule is extremely broad. It prohibits payment for enhanced or prioritized access on a network of a broadband Internet access provider. The NPRM is candidly clear about the Commission's position on nondiscrimination: "We understand the term 'nondiscriminatory' to mean that a broadband Internet access service provider may not charge a content, application, or service provider for enhanced or prioritized access to the subscribers of the broadband Internet access service provider."⁶

This is a two-way prohibition—the rule prevents Internet providers from charging, but it also prohibits application developers from voluntarily entering into desired arrangements that could benefit application delivery. The FCC's proposed prohibition on pricing is contrary to the position taken by the Department of Justice (DOJ) in comments responding to the Commission's Notice of Inquiry regarding a national broadband plan.⁷ In its comments, DOJ warns that price regulation could discourage deployment and efforts to expand broadband access:

Although enacting some form of regulation to prevent certain providers from exercising monopoly power may be tempting... care must be taken to avoid stifling the infrastructure investments needed to expand broadband access. In particular, price regulation would be appropriate only where necessary to protect consumers from the exercise of monopoly power and where such regulation would not stifle incentives to invest in infrastructure deployment.⁸

⁶ NPRM at p. 41, note 106.

⁷ Notice of Inquiry, *In re A National Broadband Plan for Our Future*, 24 F.C.C.R. 4342, ¶ 6 (2009), available at <http://hraunfoss.fcc.gov/edocs/public/attachmatch/FCC-09-31A1.pdf> ("FCC Broadband NOI").

⁸ Ex Parte Submission of the Department of Justice, Jan. 4, 2010.

The DOJ's comments address only the residential market, but would seem to apply equally to the discussion of a two-sided marketplace where application and content providers would pay for QoS and prioritization and therefore help subsidize broadband Internet access subscription prices.

The DOJ's caution is fully consistent with this Commission's traditional economic and regulatory approach: apply regulations only where the market is not subject to competitive safeguards or where there is a significant likelihood of harm to competition in specific markets and when the restrictions imposed will be effective in eliminating the harm.⁹ The Commission previously has recognized that the Broadband Internet access market contains several emerging platforms and providers, including both intermodal and intramodal competitors, and that Commission policies will promote the availability of competitive broadband Internet access services to consumers via multiple platforms.¹⁰ In such a marketplace, the Commission can rely upon competition between firms, rather than technical and specific prohibitions that will exclude many beneficial arrangements, to ensure that consumers enjoy innovative services and low prices.¹¹ In fact, in 2007, the Federal Trade Commission's Internet Access Task Force issued exactly such a recommendation and caution:

*No regulation, however well-intended, is cost-free, and it may be particularly difficult to avoid unintended consequences here, where the conduct at which regulation would be directed largely has not yet occurred.*¹²

⁹ See, e.g., *Rules for Advanced Wireless Services in the 2155-2175 MHz Band*, 22 FCC Rcd. 17035, 17080 & n205 (2007); *Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz and 2175-2180 MHz Bands*, 19 FCC Rcd. 19263, 19291 (2004). See also 47 U.S.C. § 160(a-c) (Congressional mandate to forbear from regulation where marketplace contains competition).

¹⁰ See *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, 20 FCC Rcd. 14853, 14856 (2005).

¹¹ See FCC Study of Internet Backbone Market, released September 26, 2000, Appendix, at 47.

¹² Federal Trade Commission, Internet Access Task Force, Broadband Connectivity Competition Policy FTC Staff Report, released June 27, 2007, at p.155.

The FTC’s Task Force found solid evidence, as has the FCC in the past, of growing competitiveness in even the newborn broadband Internet access market, including increasing consumer demand and access speeds, falling prices, and new market entrants.¹³ While ACT would not hesitate to advocate regulation where the exercise of significant market power was present and being used to exclude smaller and newer providers of applications and services, the fear of hypothetical exercise of such power should not be used to justify regulatory prohibitions that likely will inhibit new applications and services that might be provided by these very same application and software developers.

B. The Reasonable Network Management Exception Does Not Apply to QoS or Prioritization of Software and IT Services

Perhaps recognizing that the prohibition on nondiscrimination might be overbroad, the NPRM includes an exception for practices related to “reasonable network management.” This exception would apply to practices that “address quality-of-service concerns.” However, the NPRM clarifies that quality of service can only be furthered “for purposes of managing a network, not for purposes of offering a managed or specialized service.”¹⁴ This exception would thus not apply to QoS or prioritization of software and IT services.

ACT believes that the exception to network management should not be so limited. Broadband Internet access providers should be able to charge, and software and IT service providers to pay, for the enhanced delivery of software and IT services as a “reasonable network management” practice. As we explore in more detail in Section V, we believe creating a market for QoS and prioritized delivery will benefit both application developers and users.

C. No Matter How it is Implemented, an Exemption Process for “Managed or Specialized Services” will be Overly Vague, Difficult for Small Businesses, and Harm IT Innovation

¹³ Ibid.

¹⁴ NPRM at p.50, note 253.

The Commission recognizes that there could be certain “managed” or “specialized” services that would benefit from QoS and prioritization and that should be exempt from the proposed rules. ACT commends the Commission for recognizing the need for different policies for innovative new services and business models – the kind that many of our members actively seek to create and implement. However, we fear that no matter how an exemption process is implemented, it will be overly vague, be difficult and costly for smaller businesses, and have the effect of slowing and stifling innovation. And while these costs may not always be borne directly by small business, the time it takes ISPs to seek a declaratory ruling from the FCC will cost innovators’ time, and create uncertainty.

As a threshold matter, we believe that any regulatory regime that presumes that QoS or prioritization is discrimination unless proven otherwise is inherently flawed. There will be problems of interpretation, oversight and delay. Particularly in our tough economic times, we need innovation on the Internet to run on Internet speed, not at the slower pace of government. The FCC should not adopt regulations that will prohibit business relationships between third parties and Internet access providers or other carriers absent significant evidence that market power is being used to exclude third parties. Moreover, while ACT could respond to the Commission’s call for assistance in defining the category of “managed or specialized services”—and advocate for a broad, inclusive definition—we would still be left wondering how the process for obtaining an exemption would occur. In this regard, we have two specific concerns.

First, declaratory judgment proceedings are costly and time consuming. The Commission states that “[p]roviders would not be required to seek a declaratory ruling from the Commission before a practice is actually deployed, but they *or others* would be free to do so.”¹⁵ [emphasis added]. Third parties would be free to petition the Commission on a number of service offerings—even those already implemented—and claim that they were not within the

¹⁵ NPRM p. 49 at 134.

definitional category of “managed or specialized services.” Far from offering the greater clarity and certainty to Internet users and providers that the Commission seeks, the exemption process would impose uncertain cost and delay. When it comes to the fast-paced software technology industry, a decision delayed is often an innovation denied.

Additionally, an exemption process would harm the overall software and IT services marketplace. Bringing new ideas to market involves a complex but sometimes fragile ecosystem. Venture capitalists analyze risks and likely costs before investing in newer companies. More established companies also analyze risk, although they are often more adept at gauging regulatory risk. For all firms, the higher the risk profile of a project, the less likely it will be funded and pursued. The risk that the Commission, or a company’s competitors, or pro-regulatory advocacy groups, could deny a new product or business model that uses enhanced or prioritized services would delay and raise the costs of beneficial telemedicine, eLearning, and other cloud-based product offerings.

A. The Commission Should Focus on Competitor Discrimination, not Packet Discrimination

ACT’s small and medium-size membership has traditionally been wary of the market power held by large telecommunication companies. Anticompetitive business practices of larger entities can have devastating effects on smaller companies, particularly startups. We therefore concur with the Commission’s concern over possible anticompetitive conduct by broadband Internet service providers.¹⁶ The Commission’s core focus can and should be one of recognizing and remedying actual instances of abusive practices by broadband Internet access providers.

¹⁶ The NPRM explicitly states that the proposed nondiscrimination rule will “focus on that portion of the connection between a broadband Internet access service subscriber and the Internet for which the broadband Internet access provider...may have the ability and the incentive to favor or disfavor traffic designed for its end-user customers.” NPRM at p. 42, para 107.

However, the NPRM goes much further than offering remedies for anticompetitive conduct. Instead, the Commission considers pricing arrangements for enhanced delivery to be a proxy for harmful discrimination against companies, unless proven otherwise. We wonder why a technology prohibition (thou shall not discriminate packets) is the appropriate rule, when a directive to not discriminate against competitors would suffice. While it can be argued that it is difficult to recognize and distinguish beneficial and harmful instances of packet discrimination, a blanket rule throws the good out with the bad. And as previously mentioned, this presumption of harm will in many instances be prohibitive for small and medium-size businesses that desire to have their offerings categorized as a managed or specialized service, but do not have the financial or legal wherewithal to pursue the exemption.

Beyond the definitional problems of key terms and the costs it imposes on innovative software businesses, we believe the nondiscrimination rule is simply unwarranted in light of the Commission's proposed fourth rule on competition:

Subject to reasonable network management, a provider of broadband Internet access service may not deprive any of its users of the user's entitlement to competition among network providers, application providers, service providers, and content providers.

If the Commission believes it must supplement its fourth rule on competition, it may want to investigate options that focus on bad actions instead of pursuing broad technology-driven nondiscrimination restrictions. For instance, the Commission could explore how to emulate the tort of wrongful interference with business relations, a common claim in business disputes.¹⁷

¹⁷ Almost every state recognizes the tort of wrongful interference with business relations. Courts consider:

- (1) the nature of the defendant's conduct;
- (2) the defendant's motive;
- (3) the interests of the plaintiff with which the defendant's conduct interferes;
- (4) the interests sought to be advanced by the defendant;
- (5) the social interests in protecting the defendant's freedom of action and the plaintiff's contractual interests;
- (6) the proximity or remoteness of the defendant's conduct to the interference; and
- (7) the relations between the parties.

In the next section, we describe how partnering between software application developers and broadband Internet access providers can create *opportunities* for developers and new or value-added services for users.

At the present time, ACT has seen no credible or significant evidence that new laws are needed to prevent market power from being used to prevent worthwhile applications and software from being accessed by consumers in favor of applications or services controlled by the carriers or access providers.¹⁸ Rather than adopt overbroad bans on contractual arrangements that will have the unintended consequence of discouraging the introduction of innovative and new services from smaller application and software developers, the Commission should follow a more directed approach to the potential problem of discrimination:

- 1). The Commission should focus on traditional antitrust analysis, as well as the adoption of the four principles that it has previously espoused as policy, and resolve complaints where specific competitors have been unlawfully or improperly excluded from or significantly impaired in providing competitive service.

- 2). The Commission should continue its present course of adopting rules, policies and procedures that foster the development of multiple competing platforms for providing access to the Internet. More will be accomplished by fostering competition between wireline cable and telephone company service providers, as well as providing sufficient spectrum for wireless carriers, than by preventing these service providers from entering into arms-length nuanced arrangements with third parties for the provision and development of new services and applications.

¹⁸ While ACT is aware of several complaint or enforcement proceedings, including Madison River Communications and Comcast, the allegations in these proceedings involve blocking or degrading services provided by competitors that would have violated the first four principles of net neutrality adopted by the Commission, or other prohibitions already adopted by the Commission.

3). Should the FCC remain concerned about the development of what is still a very young Internet, it can continue to collect information about access that is provided to competitive services, as well as network management practices, and adopt more narrow, targeted restrictions should they become necessary in light of specific anticompetitive behavior or other behavior that is antithetical to the interest of the consumers of Internet services.

V. NETWORK MANAGEMENT CREATES INTERNET OPPORTUNITIES FOR SOFTWARE DEVELOPERS

The “best efforts” approach of the Internet for packet delivery has served the Internet very well for many years. However, this approach may no longer be good enough for delivery of today’s applications. Today’s applications and IT services demand increased levels of QoS for applications and content. ACT views this as an opportunity to partner with broadband Internet service providers, not be oppressed by them.

There exists a large number of small and independent software and application developers, many of whom are interested in offering applications to their customers that would benefit from QoS. Given how competitive the marketplace of Internet applications and Internet Service Providers is, ISPs have no incentive to disadvantage small software developers in favor of their own applications. On the contrary, the vitality and competitiveness of the marketplace mean that both carriers and software developers have a strong incentive to put their best foot forward when entering into cooperation agreements.

There are two types of customers who are already purchasing enhanced QoS offerings from broadband service providers: end-users (primarily enterprise customers) and content providers. Not all content providers demand enhanced QoS. This option is demanded only by those content providers that supply QoS-needy content. Real-time applications represent an important type of QoS-needy content. Real-time video, Voice over Internet Protocol, and online

video games cannot be experienced properly by the end-user if subjected to jitter. Accordingly, real-time content providers demand enhanced QoS.

However, the QoS offerings aimed at content providers are the target of net neutrality proponents. Net neutrality proponents speak of “access tiering” — that is, offering tiered levels of QoS at different prices — as if it is some hypothetical strategy that will be employed at some future date to foreclose unaffiliated content providers. In reality, tiered QoS offerings are already here at different layers of a broadband service provider’s network, and for legitimate technical and economic reasons. Content providers are voluntarily entering into contracts with broadband service providers presumably because content providers (and their customers) value the service enhancements more than they care about the prices for the enhancements.

Enhanced QoS is not forced upon content providers as part of some bundle of services that the providers otherwise do not want, or because the broadband service provider has monopoly power over the supply of one of the products in the bundle. Furthermore, broadband service providers offer enhanced QoS at a surcharge to content providers, not because they are trying to foreclose potential rivals in an upstream market or to degrade the quality for content providers that decline the QoS option, but because it is costly to offer such enhancements and because a managed network ultimately generates benefits for Internet users. Broadband service providers currently may offer enhanced QoS to content providers in the form of managed hosting of content in nearby data centers, and prioritization of traffic at the IP packet layer. By purchasing hosting services from a broadband service provider, a content provider can gain immediate access to the provider’s network. A content provider can also take advantage of the provider’s service level agreements (SLAs), under which the broadband service provider is required to provide proof of a promised level of service. Each SLA contains a technical component, which offers several classes of service. A content provider can request that a broadband service provider offer a fully managed hosting solution or it can manage its own

applications hosted in an Internet Data Center (IDC) owned by a broadband service provider. For example, Qwest offers the following commitment to customers that outsource their Web presence: “You receive industry-leading SLAs. Many data centers are built with high degrees of redundancy in critical systems such as power, hvac, fire detection and suppression and security.”

In the case studies below, we describe services that would benefit from enhanced quality of service rather than best-effort delivery. Our examples focus on three areas:

a. Telemedicine

Telemedicine would benefit greatly if ISPs were allowed to give service guarantees to telemedicine applications between patients and hospitals. Moreover, the general public would benefit if network operators were allowed to give priority to the delivery of emergency information over less urgent tasks, such as the downloading of music. Insisting on best-effort delivery can inhibit supportive technologies that can help millions of Americans with special needs. For example, regulations that prohibit service-level guarantees hamper video relay and peer-to-peer video services. For Americans with hearing loss, these services are functionally equivalent to a voice phone. Regulations may also inhibit the development of innovative Internet services, such as text-to-speech applications that help the blind.

Moreover, regulations insisting on best-effort delivery can stifle future innovation. Because these regulations would prohibit ISPs from offering tailored services to customers, some unique network-based applications would never be developed to help the elderly and infirm. For example, under the regulations proposed by the FCC, ISPs could be prohibited from adding extra network security for online access to hospital medical data banks. Dedicating bandwidth to integrated monitoring and interventions systems for chronically ill patients would be illegal, since it would require prioritizing medical needs over less critical information – like music downloads and other entertainment content.

The limitations that would be imposed by the proposed FCC regulations have serious practical implications for the advancement of telemedicine, as the example below shows:

Rene, a hard-working American family man, is stuck at home during recovery from knee replacement surgery. The doctors sent him home with a complex piece of equipment to guide his exercise therapy. Every other day, a physical therapist drives all the way out to Rene's house to coach the patient and monitor his progress through therapy workouts -- at a cost of several hundred dollars per visit. On alternate days, Rene struggles with his therapy technique and gets more and more discouraged.

Fortunately, there is a better approach to this situation: a startup health care company wants to offer in-home therapy with more personal attention and high-tech equipment that assists and monitors progress -- anytime the patient is ready. Their patent-pending device also includes a video display, camera and microphone, so therapists can watch live, monitor equipment movement, and coach the patient through his exercises -- without wasting hours driving to patients' homes.

However, this new device requires a high-speed, low-latency Internet connection that is much more expensive than what patients typically have in their homes. The company wants to bundle the high-speed upgrade into their therapy service during the several months recovery period. Their technicians would handle the installation and connection management, too.

Rene's local internet service providers would consider such an arrangement with the service provider, except that new federal regulations are preventing them from doing so. The FCC will not let an application provider pay for better internet service to subscribers, fearing that might disadvantage competing providers who did not want to pay for better service.

But all Rene fears now is spending another six months paying twice as much for only half the therapy he needs to get back on his feet.

At a time when we want to encourage greater efficiency in health care, we should not allow Net Neutrality to neutralize the innovation potential of America's entrepreneurs

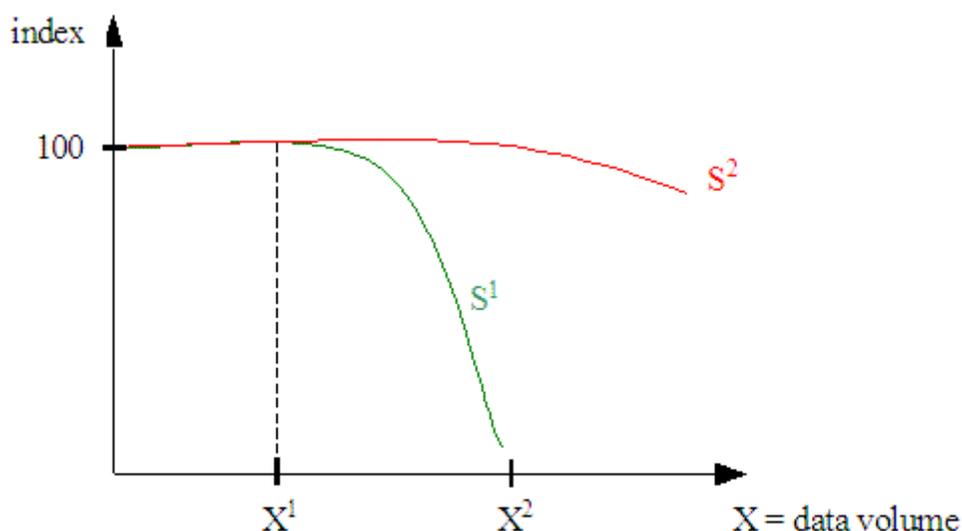
b. e-learning

The use of e-learning as a separate concept may be a misnomer. At the core, e-learning is an umbrella term that relies on technology from nearly every other segment, including virtual blackboards, video conferencing, social networking, and even games. E-learning is not a technology but a label describing the use of a particular technology. When a school uses iTunes to distribute video podcasts of a lecture, iTunes is an e-learning application. When iTunes is used to download a song, it is an entertainment application. An insistence on best-effort delivery could stifle the technologies that make e-learning possible. For applications such as interactive lectures and real-time voice conversations, the quality of service significantly suffers in the case of delay and data packet loss. E-learning applications require more data to be moved with greater levels of effort to ensure quality of service. In a strictly neutral Internet, low-value, elastic applications such as P2P file sharing or online videos are likely to crowd-out quality-sensitive services and the demand for high-value, quality-sensitive applications will decrease if the quality of service cannot be maintained due to congestion. Therefore, regulations insisting on best-effort delivery could, in the long run, undermine innovative new services such as online universities, which allow for broader access to education.

Figure 1 shows the crowding out of a quality sensitive service. Suppose there are two different services with S1 being a highly quality sensitive application (e.g. e-learning, telemedicine) and S2 an application that is rather elastic with respect to delays and data packet loss (e.g. file sharing). The Y-axis shows the individual demand or willingness to pay for the respective service given the total bandwidth consumption X . With bandwidth consumption below

X1 where no congestion occurs, the index of the demand for all three applications will be 100. If the data volume exceeds X1, congestion in the form of delay and jitter might occur. This causes the demand for the highly quality-sensitive service S1 to decrease. The demand for S2 will not be affected by the slight reduction in quality of service. If the total bandwidth consumption exceeds X2, the high value, quality sensitive service S1 will be totally crowded out because the marginal (potential) consumer of this service will not accept the low quality any more.

Figure 1. Crowding out of quality-sensitive services



Certainly, excess capacities are needed to deal with the peak-load problem of data traffic, but they are very expensive and, beyond a certain level, economically inefficient. More important, even huge overcapacities cannot solve the congestion problem sufficiently because 99% quality is simply not enough for some applications. Peak-load pricing or volume-based pricing models could partially remedy the problem for services with medium quality-sensitivity, but they are not able to solve the problem with respect to highly quality-sensitive services. Such pricing models could be extremely complex and – not least – inconvenient for consumers. Therefore, a different treatment of different data packets according to their quality sensitivity and economic value

could be an efficient solution. Such regimes are often referred to as Quality of Service models or traffic management.

c. Online gaming

The gaming industry has become increasingly important to our economy, computer games now outsell movies and music regularly, with more than \$8 Billion¹⁹ spent annually in the United States alone. Furthermore, the technology created by the gaming industry leads to innovations in other fields, such as telemedicine, e-learning and movies.

Online video game providers may purchase enhanced QoS as an option with hosting services from broadband service providers. For example, Sony produces *EverQuest*, a three-dimensional, fantasy, massive multiplayer online role-playing game (MMORPG) that requires users to pay a recurring monthly fee. For a time, *EverQuest* was the most popular MMORPG in the industry. Blizzard Entertainment produces *World of Warcraft*, another MMORPG set in a fantasy environment. As of September 2006, *World of Warcraft* had almost 7 million active subscriptions worldwide. In both games, online subscribers control a character avatar “exploring the landscape, fighting monsters and performing quests on behalf of computer controlled characters.” In addition to cash incentives for good performance, a player is rewarded with experience that allows her character to improve in skill and power. MMORP games have hundreds of thousands of users playing simultaneously. To achieve the best possible fantasy environment for their online gaming websites, Sony and Blizzard place their servers in an Internet Data Center (IDC) owned by broadband service providers all over the world. They simply cannot afford for the players of their games to experience jitter.

Software developers have made great strides over the last few years, creating exciting new applications that make it possible to play complex realistic games, receive medical treatment, and even complete entire university degree programs online. However, the

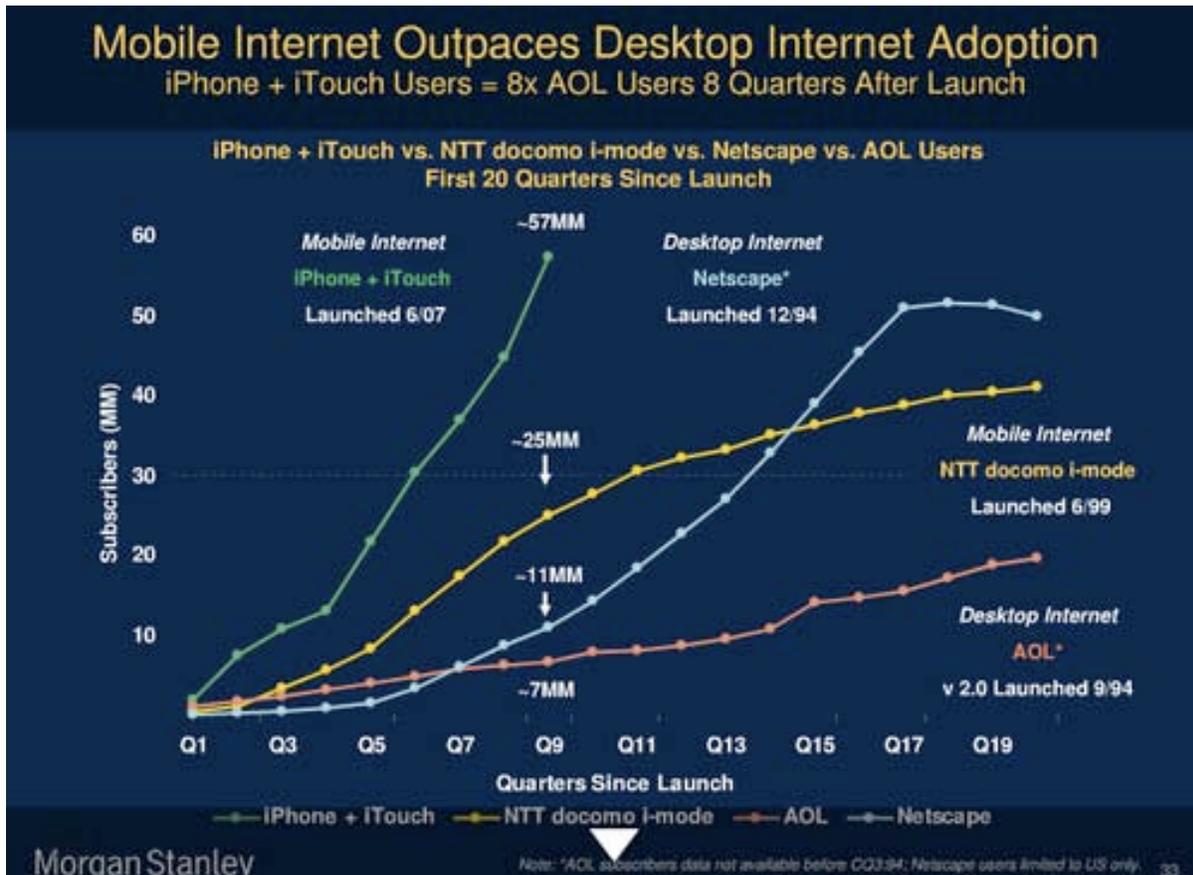
¹⁹ <http://www.cnn.com/2007/TECH/09/24/halo3.launch.ap/index.html>

performance of some of these new applications is hampered because many software developers have to rely on the public Internet to deliver their software to users. Additionally, the only way to improve performance is through spending programmer time creating complicated compression algorithms, instead of new features. This is unfortunate, and may preclude further investment in innovation. In many ways, software developers are ahead of the curve compared to Internet service providers. ACT therefore sees great potential for future collaborative arrangements between developers and ISPs, as many developers are willing to pay for QoS guarantees that will allow their customers to enjoy new software innovation. It would be unfortunate if FTC regulations prevented these new business models.

VI. MOBILE APPLICATIONS PRESENT NEW OPPORTUNITIES—BUT ALSO NEW CHALLENGES—TO NETWORK AND BUSINESS MANAGEMENT

The Internet has been directly responsible for millions of jobs created, and billions of dollars added to the economy. Even taking into account the “.com bomb” that hit in 2000, the overall value of Internet applications continues to grow. If the previous decade had developers’ attention on desktop applications, the next new frontier is in mobile. And the speed at which

new users are adopting mobile Internet applications dwarfs all other historical benchmarks.



However, there is a risk to this rapid adoption. Unlike wired Internet service, wireless service is dependent on a scarce resource – spectrum. Wireless ISPs cannot simply dig more trenches and pull more fiber to increase speed, quality or bandwidth. Instead they use innovative technology that compresses data into ever-smaller nuggets, essentially packing two pounds in a one-pound bag.

Companies like Qualcomm continue to invent new ways to squish more in, but the speed of their innovation is no match for the rapid rate of wireless Internet adoption.

For ACT members who write applications for mobile devices like the iPhone, Android or Windows Mobile, this bandwidth scarcity creates its own restrictions on the types of applications that can be written. Even if every developer is especially parsimonious in their bandwidth

usage, the sheer number of new applications can cause pressure on the system. This problem is even more pronounced when every bit transmitted has the same priority.

As Princeton professor Ed Felten discussed in his paper on Net Neutrality²⁰, developers usually abide by a social contract when it comes to packet collisions and congestion. Dr. Felten is afraid that providing faster access for some bits will “break the social contract”. But where Dr. Felten sees a problem, our developers see an opportunity. In basic terms, if my application doesn’t need a high Quality of Service or especially low latency, I would be happy to let another developer who does need lower latency subsidize the improvement of the network overall by paying for it.

Moreover, if a developer finds a wireless ISP to be too aggressive in managing the network, the developer may urge his users to change networks. Despite assertions to the contrary, the wireless space clearly seems to have plenty of competition.

The DoJ agrees with this contention, having previously said in the past that it does not support the assessment of net neutrality proponents that the broadband market is at best a weak duopoly and that wireless broadband cannot be a competitive substitute for wireline broadband. As the DoJ wrote, "Wireless may be a very attractive alternative for consumers who greatly value mobility and for consumers who do not place much value on the highest speeds. " [Wireless broadband] ...appears to offer the most promising prospect for additional competition in areas where user density or other factors are likely to limit the construction of additional broadband wireline infrastructure." (p.8, para 1)

a. Wireless Bandwidth Usage is Up, and ACT Members are the Reason Why

It has been suggested that Apple’s iPhone has revolutionized the smartphone market, and that iPhone users have dramatically different data usage patterns than traditional phones.

²⁰ <http://itpolicy.princeton.edu/pub/neutrality.pdf>

In fact, a September 2009 article in the *New York Times* calls the iPhone “the Hummer of cellphones,”²¹ not because of its effects on the environment, but because the average iPhone user takes in nearly 60% more data than any other phone on the market. What often gets left out of this discussion is the fact that the change in usage stems not from applications developed by Apple or by AT&T, but rather from the more than 100,000 applications found at Apple’s store. Yet 71% of iPhone developers are not charging for applications, or are charging less than US \$3.00. Many use advertising revenue to offset costs, but that only works for products that will have broad appeal, especially to the desirable 18-35 year-old demographic. Given that incredibly low dollar per user amount, and the fact that the iPhone still represents less than 1% of all phones sold worldwide, developers must find other ways to pay the mortgage. Outside the iPhone marketplace, the total premium mobile services market worldwide is only 8.6 billion dollars²² in 2008, less than Microsoft’s quarterly revenue.

b. Business Models Matter – protecting “freemium” features for Enterprise offerings

The NPRM seeks to protect competitors from the possibility of anti-competitive behavior by the large wireless ISPs, but could destroy an important tool for small software developers to get products into the market - and still make money.

One popular method is through the offering of a free product, with limited or “best effort” services, and a premium product that is a pay-for application.²³ Common examples of such “freemium” products include Congress+, Pandora, and LinkedIn. But in today’s social networking market, increasing the speed at which people connect is an incredibly valuable offering.

²¹ <http://www.nytimes.com/2009/09/03/technology/companies/03att.html>

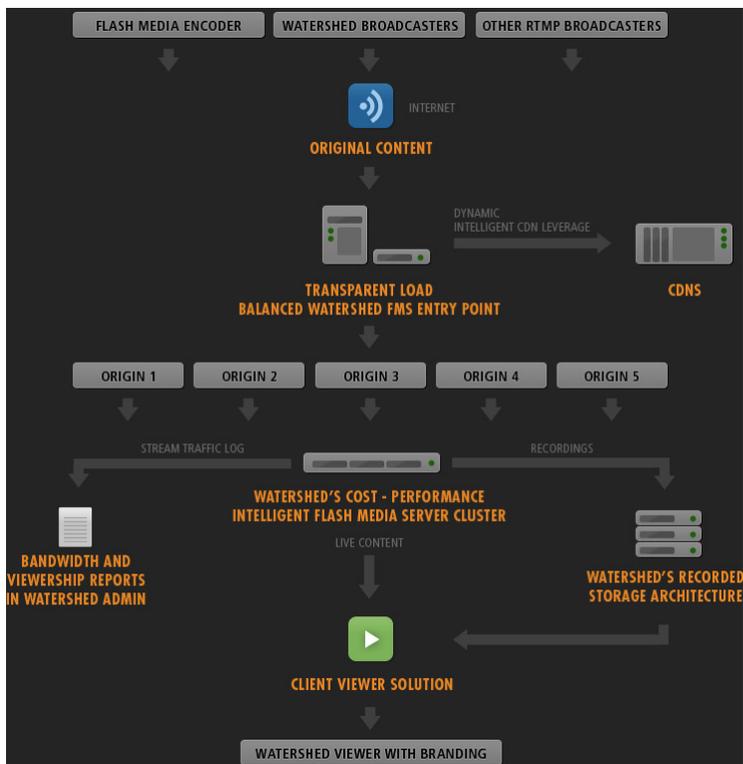
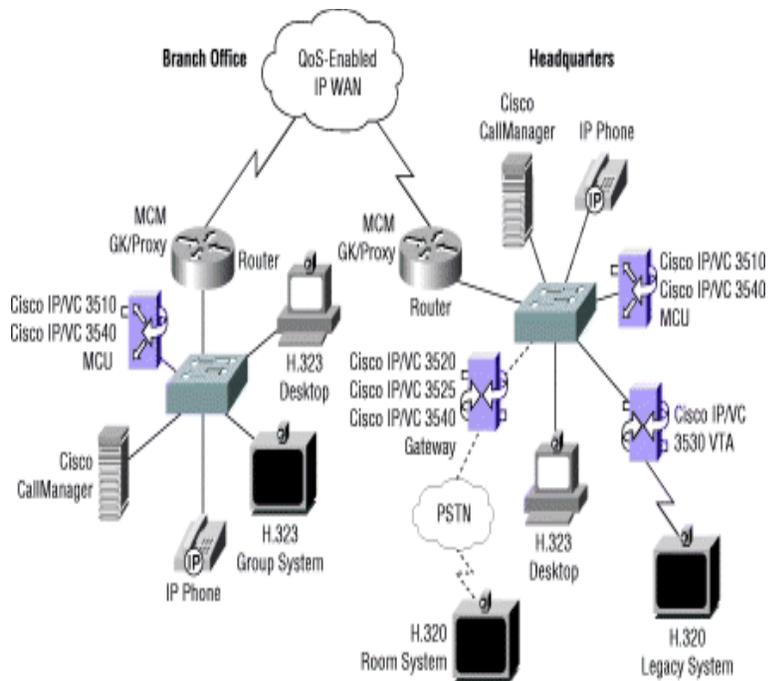
²² figures from Mobile Entrainment Forum, 2008

²³ http://money.cnn.com/magazines/business2/business2_archive/2006/10/01/8387115/index.htm

An obvious example of a product that could benefit from a freemium model with higher level service guarantees would be Ustream. Ustream.TV is a live, interactive video broadcast platform that enables anyone with a camera and an Internet connection to quickly and easily broadcast to a global audience of unlimited size. Ustream has a mobile broadcasting application for both the iPhone and the Verizon Android that allows users to broadcast live using a 3G network. The company, founded by two Iraq war veterans “as way to help overseas soldiers connect more efficiently with their families” has become a major platform for livestreaming political events. President Obama used Ustream to broadcast his recent speech to the troops regarding Afghan deployment²⁴ and Senator McCain used the service during the 2008 Presidential campaign. The web app portion of the service features a viewer and an interactive chat window where participants can ask questions and discuss what is being shown. It allows organizations both small and large to “build global communities around shared live experiences” and currently has more than 10 million unique visitors per month. The broadcast application and the web site are free to use, with a pay-for option available without advertising – but no option to pay for better quality of service.

Ustream has been incredibly successful in getting viewers for free, but now must find a way to fund its free offerings beyond an “ad-free” version. For Ustream to be successful, it needs to offer solutions to businesses seeking to use video conferencing to lower costs and be more environmentally sound. But to compete against video conferencing behemoths like Cisco, Ustream must find a way to give enterprise customers better performance. A quick review of both Ustream and Cisco’s technology implementation profile shows one truly significant difference. Here are the two side-by-side:

²⁴ <http://www.ustream.tv/recorded/2706187>



The one place where the Ustream solution has no comparison is here:



Cisco's technology wins out because it runs over a private Internet connection running a WAN (Wide Area Network) with QoS. Because Ustream uses the public Internet, and therefore can only offer a "best effort" solution, it will never compare to the Cisco offering.

Unfortunately, the NPRM's proposed rules governing "enhanced" services would preclude small businesses from cutting revenue sharing deals with carriers to provide any "enhanced" service that would include a guarantee of higher quality service through lower latency on a specific network, buffered content hosted by the ISP, or anti-jitter features like packet prioritization. Ustream would be left out in the cold.

While passive entertainment apps may not need higher levels of service, business applications are likely to want more. Historically, entertainment and gaming applications have been analogous to developer 'lottery tickets'. For every successful World of Warcraft, there are hundreds of failed games that never even see the light of day. Enterprise applications are a far better bet. Business needs can be analyzed and quantified much more easily, with clearly defined market opportunities; this makes venture funding easier to acquire, leading to more jobs being created. The iPhone developer community has figured this out: According to Gene Munster of Piper Jaffray, 50% of iPhone developers are creating applications aimed at the enterprise. "15% of the apps will tap into the iPhone's location-based services, 10% will be entertainment oriented, 10% will specifically be video games, and another 15% will be other Enterprise-level apps. We see this as a positive indicator of the potential for Enterprise adoption of the iPhone."

c. Small business leads the way in software innovation

The FCC has stated that it is worried ISPs will use "network management" provisions to give preferential treatment to the carrier's own applications. While we understand why they

might worry, the simple truth is that carriers have chosen not to compete in the mobile applications space.

A review of the Apple iTunes store shows that AT&T has a total of seven applications out of more than 100,000 currently available. Of those, two are account management applications, one is an application to help report service failures, and one is an application to apply for a job at AT&T. Only the GPS and Uverse scheduling applications would be expected to have third party competitors.

All Applications for "at&t inc."



AT&T's GPS Navigation applications faces fierce competition from products like MotionX, TomTom, and Navigon. In fact, MotionX GPS Drive is currently the highest rated Navigation application available²⁵ and is developed by the smallest company, Fullpower Technologies. Clearly, AT&T sees greater advantage to a robust applications marketplace than the iPhone applications marketplace.

This lack of dominance in the applications market is not a problem for AT&T; rather, it is a key part of building the smartphone marketplace. From the ad campaign "there's an app for that" to product reviews, AT&T and its customers have recognized that the third party applications market is driving adoption of the iPhone. AT&T's business motivation for not

²⁵ As of Jan 6 2010.

disadvantaging third party applications is summed up in the closing paragraph of this

TechCrunch review:

It's impressive how far these Android devices have come in a year. But the software/hardware combination still lacks the refinement of the iPhone. Maybe by this time next year, with Google now taking a more hands-on approach, they'll have a device that can match Apple's. But they'll still likely lack the apps. And the iPhone will still likely lack the best Google apps. But it's good to have competition. And it's good to have two companies that can play off each other and push innovation — while at the same time, changing the industry²⁶.

d. Small business needs deals to compete with ISPs

The aforementioned search of the iTunes store showing seven AT&T apps also brought up a small business competitor to AT&T's larger business interests – RingCentral Inc. Its mobile application, called AT&T Virtual Receptionist, is a front end for a virtual PBX (a PBX is the term for a private telephone switching system usually used by business). This small startup, backed by Silicon Valley venture capital, competes directly with the big players in the PBX marketplace – including AT&T²⁷.



Tellingly, one of the biggest criticisms of RingCentral's service is its uneven quality – so much so that one review noted:

“Ringcentral has an incredibly sophisticated system for making sure calls get to the right people at the right times ... and it's easy to change your settings through the website with the help of their video tours or on-page instructions. So as long as you don't actually have anyone calling you on the phone, their phone system is very elegant and easy to use.”²⁸ [emphasis added]

This review points out the reality of software in the Internet world – our product can be perfect, but if the network fails, we fail. Clearly, RingCentral is a small business that could benefit from

²⁶ <http://www.techcrunch.com/2010/01/12/iphone-versus-nexus-one/>

²⁷ http://www.corp.att.com/gov/contracts/maas/services/maas_services_pbxtrunking.html

²⁸ <http://www.hostedpbxguide.com/Complete-Service-Reviews/ringcentral-service-quality.html>

an agreement with a carrier to provide “enhanced” services. Yet, the NPRM would prevent the very deal that could allow RingCentral to compete more effectively with AT&T. Instead, RingCentral can only partner with AT&T on the edges, like collaborating on voicemail, instead of solving its bigger quality issues.

Management of wireless broadband usage can take cues from physical world traffic, namely the creation of High Occupancy Toll (HOT) lanes. These adopted a pricing scheme that allows single-occupancy drivers to pay a premium to use high-occupancy/express lanes when necessary. A similar scheme could be adopted for applications like real-time mapping—customers could pay a premium for faster, “enhanced” service when needed (like when driving) and revert to regular service when not (like when being in the office, or walking). But Net Neutrality regulations will not allow for such wireless HOT lanes, and thus discourage the development of such applications.

VII. CONCLUSION: NEW RULES SHOULD ESTABLISH A PROTECTIVE FLOOR, BUT NOT AN INNOVATION CEILING

Software development and IT services are key areas of the U.S. economy. In order to maintain our global leadership, public policies need to encourage, not restrain, the experimentation with new business models. ACT supports legal remedies in cases where broadband Internet service providers block content, applications, devices, and competition. We also support future innovation for working with broadband Internet service providers to deliver the quality of service our software applications demand and deserve.

ACT supports a floor that preserves basic principles but does not establish a ceiling for future innovation, as this strikes the best balance for continued software and IT innovation. We refuse to believe that our customers are best served by foreclosing integration opportunities with broadband Internet service providers, allowing us to guarantee the highest quality of service when “best effort” just isn’t good enough.

Respectfully submitted,

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