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Julius Genachowski

## *On Improving Broadband and Mobile Communications*



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Thank you, Darrell. Thank you, Brookings, for hosting me and this discussion about the future of broadband and the Internet.

We've just finished a summer of big-ticket commemorations, celebrating the 40th anniversary of the Apollo landing and of Woodstock. 1969 was also a good year to be a kid in New York -- with Joe Namath calling the Super Bowl, and the Knicks' season that ended up with the legendary Willis Reed in Game 7. I grew up a long fly ball from Shea Stadium and soaked up every minute of the Miracle Mets' season. Maybe that's why I tend to believe in miracles.

But perhaps the most momentous birthday from that famous summer of 1969 -- in its way, a miracle -- went by just a couple of weeks ago with little mention. Just over 40 years ago, a handful of engineers in a UCLA lab connected two computers with a 15-foot gray cable and transferred little pieces of data back and forth. It was the first successful test of the ARPANET, the U.S. government-funded project that became the Internet -- the most transformational communications breakthrough since the printing press.

Today, we can't imagine what our lives would be like without the Internet -- any more than we can imagine life without running water or the light bulb. Millions of us depend upon it every day -- at home, at work, in school, everywhere in between. The Internet has unleashed the creative genius of countless entrepreneurs and has enabled the creation of jobs and the launch of small businesses and the expansion of large ones all across America.

That's why Congress and the President have charged the FCC with developing a National Broadband Plan to ensure that every American has access to open and robust broadband.



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The fact is that we face great challenges as a nation right now: health care, education, energy, public safety. While broadband Internet alone won't provide a complete solution to any of those problems, it can and must play a critical role in solving each one.

Why has the Internet proved to be such a powerful engine for creativity, innovation, and economic growth? A big part of the answer traces back to one key decision by the Internet's original architects: to make the Internet an open system.

Historian John Naughton describes the Internet as an attempt to answer the following question: How do you design a network that is "future proof" -- that can support the applications that today's inventors have not yet dreamed of?

The solution was to devise a network of networks that would not be biased in favor of any particular application. The Internet's creators didn't want the network architecture, or any single entity, to pick winners and losers because it might pick the wrong ones. Instead, the Internet's open architecture pushes decision-making and intelligence to the edge of the network -- to end users, to the cloud, to businesses of every size and in every sector of the economy, to creators and speakers across the country and across the globe. In the words of Tim Berners-Lee, the Internet is a "blank canvas" allowing anyone to contribute and to innovate without permission.

It's easy to look at today's Internet giants -- and the tremendous benefits they have supplied to our economy and our culture -- and forget that many were small businesses just a few years ago, founded on little more than a good idea and a no-frills connection to the Internet. Marc Andreessen was a graduate student when he created Mosaic, which led to Netscape, the first commercially successful Web browser. Mark Zuckerberg was a college student in 2004 when he started *Facebook*, which just announced the addition of its 300th millionth member. It's hard to say 'cause it's so big. Pierre Omidyar originally launched *eBay* on his own personal website. Today more than 600,000 Americans earn part of their living by operating small businesses on eBay's auction platform, bringing jobs and opportunities to Danvers, Massachusetts, Durham, North Carolina, Lincoln, Nebraska, and many communities in both rural and urban America.

This is the power of the Internet: distributed innovation and ubiquitous entrepreneurship, the potential for jobs and opportunity everywhere there is broadband.

And let us not forget that the open Internet enables much more than commerce. It is also an unprecedented platform for speech, democratic engagement, and a culture that prizes creative new ways of approaching old problems.

In 2000, Jimmy Wales started a project to create a free online encyclopedia. He originally commissioned experts to write the entries, but the project only succeeded after moving to volunteers to write them collaboratively.



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The result is, of course, *Wikipedia*, one of the top 10 most visited websites in the world today and one of the most comprehensive aggregations of human knowledge in our history. The potential of collaboration and social media continue to grow. It is changing and accelerating innovation. And we've seen new media tools like *Twitter* and *YouTube* used by democratic movements around the globe.

Even more, the Internet is beginning to transform health care, education, and energy usage for the better. Health-related applications, distributed over a widely connected Internet, can help bring down health care costs and improve medical services. Four out of five Americans who are online have accessed medical information over the Internet, and most of those say the information affected their decision-making. Nearly four million college students took at least one online course in 2007. The Internet can potentially connect kids anywhere to the best information and best teachers everywhere. And the Internet is helping enable smart grid technologies, which promise to reduce carbon dioxide emissions by hundreds of millions of metric tons.

At the same time, we've also seen great strides in the center of the network. Most Americans' early exposure to the Internet was through analog modems, which allowed a trickle of data through the phone lines to support early electronic bulletin boards and basic email. Over the last two decades, thanks to substantial investment and technological ingenuity, companies devised ways to retrofit networks initially designed for phones and one-way video to support two-way broadband data streams connecting homes and businesses across the country. And a revolution in wireless technologies -- using licensed and unlicensed spectrum -- and the creation of path-breaking devices like the *Blackberry* and the *iPhone* have enabled millions of us to carry the Internet in our pockets and our purses.

The lesson of each of these stories and innumerable others like them is that we cannot know what tomorrow holds on the Internet, except that it will be unexpected; that the genius of American innovators is unlimited; and that the fewer obstacles those innovators face in bringing their work to the world, the greater our opportunity as citizens and as a nation.

Now, notwithstanding its unparalleled record of success, today the free and open Internet faces emerging and substantial challenges. We've already seen some clear examples of deviations from the Internet's historic openness. We've witnessed certain broadband providers unilaterally block access to VoIP applications (phone calls delivered over data networks) and implement technical measures that degrade the performance of peer-to-peer software distributing lawful content. We have even seen at least one service provider deny users access to political content.

And as many members of the Internet community and key Congressional leaders have noted, there are compelling reasons to be concerned about the future of openness.



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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. I don't intend that remark as a policy conclusion or as a criticism. It is simply a fact about today's marketplace that we must acknowledge and incorporate into our policymaking.

A second reason involves the economic incentives of broadband providers. The great majority of companies that operate our nation's broadband pipes rely upon revenue from selling phone service, cable TV subscriptions, or both. These services increasingly compete with voice and video products provided over the Internet. The net result is that broadband providers' rational bottom-line interests may diverge from the broad interests of consumers in competition and choice.

The third reason involves the explosion of traffic on the Internet. While [With] the growing popularity of high-bandwidth applications, Internet traffic is roughly doubling every two years. Technologies for managing broadband networks have become more sophisticated and widely deployed. But these technologies are just tools. They cannot by themselves determine the right answers to difficult policy questions -- and they raise their own set of new questions.

In acknowledging the existence of challenging competitive, economic, and technological realities for today's Internet, I want to underscore that this debate, as I see it, isn't about white hats or black hats among companies in and around the network. Rather, there are inevitable tensions built into our system -- important and difficult questions that we have an obligation to ask and to answer correctly for our country.

When I worked in the private sector, I was fortunate to work with some of the greatest innovators of our time. That taught me some lessons about the importance of innovation and investment. It also taught me the importance of developing clear goals and then being focused and practical in achieving them, making sure to have the best input and ideas from the broadest group possible.

I am convinced that there are few goals more essential in the communications landscape than preserving and maintaining an open and robust Internet. I also know that achieving this goal will take an approach that is smart about technology, smart about markets, smart about law and policy, smart about the experiences of ordinary consumers, and smart about the lessons of history.

The rise of serious challenges to the free and open Internet puts us at a crossroads. We could see the Internet's doors shut to entrepreneurs, the spirit of innovation stifled, a full and free flow of information compromised. Or we could take steps to preserve Internet openness, helping ensure a future of opportunity, innovation, and a vibrant marketplace of ideas.



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I understand the Internet is a dynamic network and that technology continues to grow and evolve. I recognize that if we were to create unduly detailed rules that attempt to address every possible assault on openness, such rules would become outdated quickly. But the fact that the Internet is evolving rapidly does not mean we can, or should, abandon the underlying values fostered by an open network, or the important goal of setting rules of the road to protect the free and open Internet.

Saying nothing and doing nothing would impose its own form of unacceptable cost. It would deprive innovators, investors, and the public of confidence that a free and open Internet we depend upon today will still be here tomorrow. It would deny the benefits of predictable rules of the road to all players in the Internet ecosystem. And it would be a dangerous retreat from the core principle of openness -- the freedom to innovate without permission -- that has been a hallmark of the Internet since its inception, and has made it so stunningly successful as a platform for innovation, opportunity, and prosperity.

In view of these challenges and opportunities, and because it is vital that the Internet continue to be an engine of innovation, economic growth, competition, and democratic engagement, I believe the Federal Communications Commission must be a smart cop on the beat preserving a free and open Internet.

This is how I propose we move forward: To date, the FCC has addressed these issues by announcing four Internet principles that guide our case-by-case enforcement of the communications laws. These principles can be summarized as:

Network operators cannot prevent users from accessing the lawful Internet content, applications, and services of their choice, nor can they prohibit users from attaching non-harmful devices to the network. These principles were initially articulated by Chairman Michael Powell in 2004 as the "Four Freedoms," based on work that was done under Chairman Reid Hundt in the late 1990s, and later endorsed in a unanimous 2005 policy statement issued by the Commission under Chairman Kevin Martin and with the forceful support of Commissioner Michael Capps, who of course remains on the Commission today. In the years since 2005, the Internet has continued to evolve and the FCC has issued a number of important decisions involving openness. Today, I propose that the FCC adopt the existing principles as Commission rules, along with two additional principles that reflect the evolution of the Internet and that are essential to ensuring its continued openness.

The fifth principle is one of non-discrimination -- stating that broadband providers cannot discriminate against particular Internet content or applications. This means they cannot block or degrade lawful traffic over their networks, or pick winners by favoring some content or applications over others in the connection to subscribers' homes. Nor can they disfavor an Internet service just because it competes with a similar service offered by that broadband provider. The Internet must continue to allow users to decide what content and what applications succeed.



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This principle will not prevent broadband providers from reasonably managing their networks. During periods of network congestion, for example, it may be appropriate for providers to ensure that very heavy users do not crowd out everyone else. And this principle will not constrain efforts to ensure a safe, secure, and spam-free Internet experience, or to enforce the law. It is vital that illegal conduct be curtailed on the Internet. As I said in my Senate confirmation hearing, open Internet principles apply only to lawful content, services, and applications -- not to activities like unlawful distribution of copyrighted works, which has serious economic consequences. The enforcement of copyright and other laws and the obligations of network openness can and must co-exist.

I also recognize that there may be benefits to innovation and investment of broadband providers offering managed services in limited circumstances. These services are different from traditional broadband Internet access, and some have argued they should be analyzed under a different framework. I believe such services can supplement, but must not supplant, free and open Internet access, and that we must ensure that ample bandwidth exists for all Internet users and innovators. In the rulemaking process I will discuss in a moment, we will carefully consider how to approach the question of managed services in a way that maximizes the innovation and investment necessary for a robust and thriving Internet.

I will propose that the FCC evaluate alleged violations of the non-discrimination principle as they arise, on a case-by-case basis, recognizing that the Internet is an extraordinarily complex and dynamic system. This approach, within the framework I am proposing today, will allow the Commission to make reasoned, fact-based determinations based on the Internet before it, not based on the Internet of years past or guesses about how the Internet will evolve.

The sixth principle is a transparency principle -- stating that providers of Internet access must be transparent about their network management practices. Why does the FCC need to adopt this principle? The Internet evolved through open standards. It was conceived as a tool whose user manual would be free and available to all. But new network management practices and technologies challenge this original understanding. Today, broadband providers have the technical ability to change how the Internet works for millions of users -- with profound consequences for those users and content, application, and service providers around the world.

To take one example, last year the FCC ruled on the blocking of peer-to-peer transmissions by a cable broadband provider. The blocking was initially implemented with no notice to subscribers or the public. It was discovered only after an engineer and hobbyist living in Oregon realized that his attempts to share public domain recordings of old barbershop quartet songs over a home Internet connection were being frustrated. It was not until he brought the problem to the attention of the media and Internet community, which then brought it to the attention of the FCC, that the improper network management practice became known and was stopped.



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We cannot afford to rely on happenstance for consumers, businesses, and policymakers to learn about changes to the basic functioning of the Internet. Greater transparency will give consumers the confidence of knowing that they're getting the service they've paid for, enable innovators to make their offerings work effectively over the Internet, and allow policymakers to ensure that broadband providers are preserving the Internet as a level playing field. It will also help facilitate discussion among all the participants in the Internet ecosystem, which can reduce the need for government involvement in network management disagreements.

To be clear, the transparency principle will not require broadband providers to disclose personal information about subscribers or information that might compromise the security of the network, and there will be a mechanism to protect competitively sensitive data.

In considering the openness of the Internet, it is also important to recognize that our choice of technologies and devices for accessing the Internet continues to expand at a dizzying pace. New mobile and satellite broadband networks are getting faster every day, and extraordinary devices like smartphones and wireless data cards are making it easier to stay connected while on the go. And I note the beginnings of a trend towards openness among several participants in the mobile marketplace.

Even though each form of Internet access has unique technical characteristics, they are all are different roads to the same place. It is essential that the Internet itself remain open, however users reach it. The principles I've been speaking about apply to the Internet however accessed, and I will ask my fellow Commissioners at the FCC to join me in confirming this.

Of course, how the principles apply may differ depending on the access platform or technology. The rulemaking process will enable the Commission to analyze fully the implications of the principles for our mobile network architectures and practices -- and how, as a practical matter, they can be fairly and appropriately implemented. As we tackle these complex questions involving different technologies used for Internet access, let me be clear that we will be focused on formulating policies that will maximize innovation and investment, consumer choice, and greater competition.

I've talked about what we need to do. Now I'd like to talk about how we should do it.<sup>1</sup>

I will soon circulate to my fellow Commissioners proposed rules prepared by Commission staff embodying the principles I've discussed, and I will ask for their support in issuing a notice of proposed rulemaking. This notice will provide the public with a detailed explanation of what we propose to do and why.

Equally importantly, the notice will ask for input and feedback on the proposed rules and their application, such as how to determine whether network management practices are reasonable, and what information broadband providers should disclose about their network



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management practices and in what form. And, as I indicated earlier, it will pose a series of detailed questions on how the Internet openness principles should apply to mobile broadband.

While my goals are clear -- to ensure the Internet remain a free and open platform that promotes innovation, investment, competition, and user interests -- our path to implementing them is not pre-determined. I will ensure that the rulemaking process will be fair, transparent, fact-based, data-driven. Anyone will be able to participate in this process, and I hope everyone will. We will hold a number of public workshops and, of course, use the Internet and other new media tools to facilitate participation. Today we've launched a new website, [www.openinternet.gov](http://www.openinternet.gov), to kick off discussion of the issues I've been talking about. We encourage everyone to visit the site and contribute to the process.

Some have argued that the FCC should not take affirmative steps to protect the Internet's openness. Let me be clear about what this is about, and what it isn't. The fundamental goal of what I've outlined today is preserving the openness and freedom of the Internet. We have an obligation to ensure that the Internet is an enduring engine for U.S. economic growth, and a foundation for democracy in the 21st century. We have an obligation to ensure that the Internet remains a vast landscape of innovation and opportunity.

This is not about government regulation of the Internet. It's about fair rules of the road for companies that control access to the Internet. We will do as much as we need to do, and no more, to ensure that the Internet remains an unfettered platform for competition, creativity, and entrepreneurial activity.

This is not about protecting the Internet against imaginary dangers. We're seeing the breaks and cracks emerge, and they threaten to change the Internet's fundamental architecture of openness. This would shrink opportunities for innovators, content creators, and small businesses around the country, and limit the full and free expression the Internet promises. This is about preserving and maintaining something profoundly successful and ensuring that it's not distorted or undermined. If we wait too long to preserve a free and open Internet, it will be too late.

Some will seek to invoke innovation and investment as reasons not to adopt open Internet rules. But history's lesson is clear: Ensuring a robust and open Internet is the best thing we can do to promote innovation and investment. And while there are some who see every policy decision as either pro-business or pro-consumer, I reject that approach. It's not the right way to see technology's role in America.

An open Internet will benefit both consumers and businesses. The principles that will protect the open Internet are an essential step to maximizing investment and innovation in the network -- on the edge of it, in the cloud -- by establishing rules of the road that incentivize competition, empower entrepreneurs, and grow the economic pie to the benefit of all.





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I believe we share a common purpose: We want the Internet to continue flourishing as a platform for innovation and communication, with continued investment and increasing deployment of broadband to all Americans. I believe my fellow Commissioners share this purpose, and I look forward to working collaboratively with them in this endeavor.

In closing, we are here because 40 years ago a bunch of researchers in a lab changed the way computers interact and, as a result, changed the world. We are here because those Internet pioneers had unique insights about the power of open networks to transform lives for the better, and they did something about it. Our work now is to preserve the brilliance of what they contributed to our country and the world. It's to make sure that, in the 21st century, the garage, the basement, and the dorm room remain places where innovators can not only dream but bring their dreams to life. And that's something none of us can be neutral about.

Thank you.