Reason Foundation
Policy Brief 85
February 2010

No More iPhones:

How Network Neutrality Threatens Wireless Broadband Innovation

by Steven Titch

The Federal Communications Commission is proposing unprecedented intervention and regulation of the wireless industry. The Commission argues that the proposals, grouped under the heading of Network Neutrality, are necessary to prevent Internet service providers from gaining monopoly-like control over Internet access and applications. The Commission cannot point to any pattern of consumer exploitation or abuse. It simply claims that new regulations are needed just in case there might be a problem. However, there is scant evidence of any such danger. At the same time, these sweeping regulations would pose highly negative consequences for consumers, businesses and American technology leadership.

The FCC has had four Open Internet guidelines in place since 2005.[1] Those guidelines were designed to protect consumers' interest in regard to Internet access. Under a general policy to encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet, they state:

- Consumers are entitled to access the lawful Internet content of their choice.
- Consumers are entitled to run applications and use services of their choice, subject to the needs of law enforcement.
- Consumers are entitled to connect their choice of legal devices that do not harm the network.
- Consumers are entitled to competition among network providers, application and service providers, and content providers.

In a Notice of Proposed Rulemaking issued October 22, 2009, FCC Chairman Julius Genachowski proposed several major changes to these established principles. First, the FCC wants to codify these guidelines as rules. This is a critical, albeit subtle, change in FCC Internet policy. The original open network principles were spelled out in terms of baseline consumer expectations. By creating a new set of rules, the FCC is converting a statement of consumer rights into a set of costly obligations on a single class of Internet service providers—obligations that do not apply to other companies involved in the delivery of Internet applications service and are of questionable value.

Second, the FCC is proposing to add an additional

guideline labeled as a "non-discrimination" rule. Such a regulation would prohibit a service provider from prioritizing or optimizing any application, voice or data, as it crosses its network. Finally, the FCC wants all Internet regulations, including this new, controversial non-discrimination regulation, to apply to wireless service providers.

A non-discrimination mandate would dumb down wireless services, devices and networks and preclude consumers from having access to the kinds of customized mobile services and related service plans they are growing to expect. Functionality is as much a part of a free and open Internet as is access. "Free and open" becomes meaningless if bandwidth crowding and congestion renders many Internet applications useless. This paper will focus on those unintended, but likely, consequences.

WIRELESS IS A CONSUMER-CENTRIC, COMPETITIVE INDUSTRY

Network neutrality proponents argue that the so-called non-discrimination mandates are necessary to ensure continued Internet innovation and prevent service providers from becoming monopolistic Internet gatekeepers. Yet in the five years network neutrality policy has been debated, there have been just two instances that would qualify as violations. The first, involving Madison River Communications, a small North Carolina phone company, was settled with a fine. The second, involving Comcast's intentional slowing of voluminous peer-to-peer traffic using the BitTorrent protocol, a network management decision that served the interest of the 95 percent of its customers who don't use the protocol, was settled through amicable agreement between Comcast and BitTorrent. The FCC, nonetheless, levied a fine against Comcast, which the cable company has challenged in court.

The aggressive application of Internet regulations to wireless is even more problematic. First, the primary tenet behind the proposal, that there is competitive market failure in broadband services that is leading the market toward monopoly, dubious enough in wireline, is even weaker in wireless. The four nationwide service providers—AT&T, T-Mobile, Sprint and Verizon Wireless, serve most U.S. markets. Regional carriers such as CellularSouth and U.S. Cellular provide more consumer choices. And companies like MetroPCS, Leap, Stelera Wireless and others are serving niche markets and competing vigorously against the national carriers.

Second, wireless service is overcoming its bandwidth limitations and becoming a legitimate alternative to wireline broadband. While a wireless device may not be the ideal medium to watch the film *Lawrence of Arabia*, it is ideal for fast-growing Web 2.0 applications such as Twitter and Facebook, which consumers use to keep in touch with friends and family around-the-clock. The portability that wireless permits, especially the way it can exploit location-based data for reference and commerce, should not be discounted either.

The introduction of the iPhone in November 2007 catalyzed consumer interest in wireless broadband. Marketing hype aside, the iPhone's introduction was groundbreaking in many ways, particularly because its business model relied on the nurturing of third-party applications developers. This business model was something entirely new. While Apple has the right to approve the applications sold through the Apple mobile apps store, the development and direction of iPhone apps was thrown open to innovators large and small. As of December 2009, at the Apple online iPhone Store alone, there were more than 100,000 applications for the iPhone,[2] most under $5.00 and many for free.[3]

The iPhone triggered a new round of competition among service providers and device makers, all of whom hoped to surpass the iPhone in terms of features, applications or ease of use. Research in Motion introduced a new line of touchscreen BlackBerry devices and LG, Samsung, Nokia, Motorola and Google, as a new entrant, all introduced smartphones of their own. Apple kept the competitive pressure on by introducing a new version of the iPhone in mid-2009. Research in Motion also launched its own mobile apps store to compete with Apple.

Consumers greeted smartphones with enthusiasm. Sales of smartphones have bucked the year-long recessionary trend. According to research firm NPD Group, smartphones accounted for 28 percent of all handset sales in the United States in the second quarter of 2009—a 47 percent increase in the category's share since the same period in 2008.[4]

BEYOND THE SMARTPHONE

Smartphones weren't the only center of wireless innovation. After two years of being little more than a novelty, Amazon.com's Kindle, a portable device that can be used to purchase, download and read books in electronic format, finally broke through to the mainstream market. This was largely due to the investments service providers made to wireless networks in response to iPhones and other wireless data devices. While it did not disclose specific numbers, Amazon said the Kindle e-book reader posted its best sales yet in the month of December—and that was only half-way through the month. Kindle is now "locked in a heated fight with rivals Sony Corp. and Barnes & Noble over who will emerge with the best-selling electronic reading device."[5]

The case for applying Internet regulation to wireless networks repeatedly returns to the premise that service providers constitute a near-monopoly and are in a position to control access to the Internet. This, Genachowski and other advocates argue, requires the check of regulations. Genachowski said as much in a speech to the Brookings Institution September 21, 2009. "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 criticism—it is simply a fact about today's marketplace that we must acknowledge and incorporate into our policymaking."[6]

The chairman is wrong as a matter of fact and law. The era of dial-up was just that—the single way to connect to the Internet was through a modem-initiated call to a third-party Internet service provider. It was, in fact, the transition to broadband that brought direct, "always-on" Internet access to consumers from facilities-based competitors: phone companies, cable companies and wireless. Quite the contrary, never in the history of telecommunications has there been as wide a choice of telecommunications and Internet service companies offering distinct and differentiated services than today in 2010.

No better can this be illustrated than among wireless service providers. The FCC's own research has found that 91 percent of Americans have a choice of four or more facilities-based wireless carriers, while 65 percent have a choice of five or more.[7]

When mobile virtual network operators (MVNOs)—companies that purchase capacity wholesale from facilities-based service providers and resell to consumers—are added, the competitive picture broadens further. Consumers in markets such as New York, Los Angeles, Chicago, Houston and Washington, D.C. can choose to purchase wireless service from between 14 and 17 companies, each offering different types of plans to meet different needs and budgets, according to CTIA-The Wireless Association. The plethora of providers is not exclusive to the major markets. Consumers in Ames, Iowa; Sandusky, Ohio; Corvallis, OR; and Casper, WY, have just as many options, CTIA determined.[8]

Other research reinforces the FCC and CTIA findings. The U.S. market is the most competitive of the 26 Organization for Economic Co-Operation and Development ("OECD") countries tracked by Bank of America/Merrill Lynch in the *Global Wireless Matrix*, with the lowest Herfindahl-Hirschman Index (HHI) measurement in the group. HHI is one of the metrics used by the Department of Justice to determine market concentration. It is calculated by squaring the market share of each firm competing in the market and then summing the resulting numbers. For example, for a market consisting of four firms with shares of 30, 30, 20, 20 percent, the HHI is 2600 ($30^2 + 30^2 + 20^2 + 20^2 = 2600$). The higher the number, the greater the market concentration.[9] When the formula is applied to the U.S. wireless market share percentages determined by Bank of America/Merrill Lynch (28.5, 26.7, 18.2. 12.1 and 14.5), the U.S. HHI is 2213. This number is substantially less than the HHI for Japan (3597), France (3808) and the Republic of Korea (3861).

Equally questionable is the premise that without a non-discrimination rule, service providers are in a position to control Internet applications and services—to choose winners and losers—and in the end, innovation would be stifled.

This premise ignores the fact that significant and disruptive innovations like iPhone and Kindle came about because wireless networks are not neutral. AT&T worked closely with Apple and modified its network to ensure the iPhone would work as designed. Similarly, Kindle had to be engineered with each wireless

company to maximize the user experience across all wireless networks. The FCC's proposed Internet regulations, and the non-discrimination rule in particular, would subject any close work between device manufacturer, application developer and/or service provider to FCC review. If the rules proposed in October had been in force two years ago, neither the iPhone, nor its competitors would have been possible. Neither would the Kindle.

First, service providers would have been prohibited from prioritizing applications. AT&T would not have been able to optimize its network for the iPhone and the management of the many data applications it makes possible.

Second, service providers would have been prohibited from customized treatment to applications associated with their business partners. Among the reasons Apple chose AT&T was because AT&T committed to engineering its network to support the iPhone and its applications. In order to be sure its Kindle works on wireless networks, Amazon must partner with the various service providers. So do Sony, Havlon, Barnes & Noble, Samsung and the other suppliers of e-book readers. Since each device operates differently, each has to be individually optimized for the network. Yet the FCC's proposed rules stand to make such customized optimization illegal, or at least subject to lengthy review to determine if such optimization falls within the boundaries of "reasonable network management." The very knowledge that the introduction and marketing of any new wireless tool can be held up, or worse, blocked, by an ad hoc FCC interpretation of what is "reasonable," is enough to chill investment and development of innovations akin to the smartphones and e-books readers today. It's hard to see how this will help or protect consumers.

If the regulations the FCC seeks to impose existed four years ago, Apple could not have approached AT&T, nor any of AT&T's competitors, seeking an exclusive marketing and distribution channel and network modifications for just its device. In its own words, the FCC's nondiscrimination principle "would prohibit broadband Internet access service providers from favoring or disfavoring lawful content, applications, or services accessed by their subscribers."[10] The iPhone or any race "to create a phone that consumers will love, instead of one that the carriers approve of," to used *Wired* magazine's words,[11] could not have happened.

Indeed, *Wired*, in a lengthy analysis on the iPhone's effect on the wireless industry, concluded that AT&T realized the key to success was yielding control, not tightening its grip.

After a year and a half of secret meetings, [Apple Chairman Steve] Jobs had finally negotiated terms with the wireless division of the telecom giant (Cingular at the time) to be the iPhone's carrier. In return for five years of exclusivity, roughly 10 percent of iPhone sales in AT&T stores, and a thin slice of Apple's iTunes revenue, AT&T had granted Jobs unprecedented power. He had cajoled AT&T into spending millions of dollars and thousands of man-hours to create a new feature, so-called visual voicemail, and to reinvent the time-consuming in-store sign-up process. He'd also wrangled a unique revenue-sharing arrangement, garnering roughly $10 a month from every iPhone customer's AT&T bill. On top of all that, Apple retained complete control over the design, manufacturing, and marketing of the iPhone. Jobs had done the unthinkable: squeezed a good deal out of one of the largest players in the entrenched wireless industry.[12]

Further down, the article continues to elaborate on the broader significance of the iPhone deal.

But as important as the iPhone has been to the fortunes of Apple and AT&T, its real impact is on the structure of the $11 billion-a-year US mobile phone industry. For decades, wireless carriers have treated manufacturers like serfs, using access to their networks as leverage to dictate what phones will get made, how much they will cost, and what features will be available on them. Handsets were viewed largely as cheap, disposable lures, massively subsidized to snare subscribers and lock them into using the carriers' proprietary services. But the iPhone upsets that balance of power. Carriers are learning that the right phone—even a pricey one—can win customers and bring in revenue. Now, in the pursuit of an Apple-like contract, every manufacturer is racing to create a phone that consumers will love, instead of one that the carriers approve of. "The iPhone is <u>already</u> changing the way carriers and manufacturers behave," says Michael Olson, a securities analyst at Piper Jaffray[13] *(emphasis author's).*

RETHINKING INTERNET REGULATION

In fact, the rapid evolution of wireless Internet applications, and the special network management and engineering they require in order to optimize consumer satisfaction with their mobile Internet experience, has companies that had once advocated network neutrality rethinking their positions.

The biggest about-face has come from Google. At one time, Google, as major bandwidth user, may have indeed believed that allowing service providers to manage and partition applications would hinder an open and accessible Internet. As Google has grown, and its services depend more on an Internet that can function quickly and efficiently, particularly in managing the hundreds of internal network operations that can be generated by the click of a consumer's mouse or wireless keypad, it has come to understand that a service provider prohibition on cooperative network management and data prioritization could cause many more problems than it would prevent.

In an entry cross-posted on their respective company's policy blogs Eric Schmidt, CEO of Google, and Lowell McAdam, CEO of Verizon Wireless, addressed this issue. They also questioned the FCC's fundamental rationale for network neutrality by asserting that "no central authority" endangers the Internet.

...(H)owever or wherever you access the Internet the people you want to connect with can receive your message. There is no central authority that can step in and prevent you from talking to someone else, or that imposes rules prescribing what services should be available.

Transformative is an over-used word, especially in the tech sector. But the Internet has genuinely changed the world. Consumers of all stripes can decide which services they want to use and the companies they trust to provide them. In addition, if you're an entrepreneur with a big idea, you can launch your service online and instantly connect to an audience of billions. You don't need advance permission to use the network. At the same time, network providers are free to develop new applications, either on their own or in collaboration with others.

This kind of "innovation without permission" has changed the way we do business forever, fueling unprecedented collaboration, creativity and opportunity. And because America has been at the forefront of most of these changes, we have disproportionately benefited in terms of economic growth and job creation.[14]

Internet regulations such as those proposed by the FCC replace "innovation without permission" with "mother, may I?" While the NPRM allows for "reasonable" network management, it never defines reasonable. At the same time, the NPRM aims to set "non-discrimination" as a standard condition—"a bright-line rule against discrimination... may better fit the unique characteristics of the Internet."[15]

That means any carrier's attempt at network management would be subject to bureaucratic review. The FCC admits as much. "We believe that a case-by-case approach to providing more detailed rulings in this area is inevitable and valuable," the NPRM reads.[16] How long this process would take is anybody's guess. In a free market, two negotiating parties can settle on a definition of "reasonable." This is exactly what happened in the Comcast-BitTorrent case, which was resolved in a matter of weeks. Government as a rule takes much longer. The FCC took 18 months to approve the Sirius-XM satellite radio merger. By contrast, in an unregulated environment, in the same space of 18 months the iPhone attracted more than a dozen competitors while its price dropped from $499 to $99.

FREE AND OPEN INTERNET?

In his address to the Brookings Institution, the FCC Chairman outlined the FCC's case for Internet regulation , using the term "free and open Internet" seven times, in addition including the phrase in the title of the speech. When the Chairman talks of a preserving an "open" Internet, he defines it as an environment where service providers allow unhindered access to all legal applications now and in the future. He is correct when he said "we cannot know what tomorrow holds on the Internet, except that it will be unexpected."[17]

But the FCC's definition of "open" stops short. We would agree that an open Internet allows unfettered access to any application. Yet it is also true that the Internet is only open to the extent that applications can work correctly. A video application is no good if its streaming is continually interrupted because of bandwidth congestion. A car racing game application is no

fun if transmission latency prevents the player from executing a tricky steering maneuver before crashing.

We agree with the FCC's basic goal: Internet access should be affordable and available. Applications should be open in that they are freely accessible, which also means they must work the way they are supposed to.

Yet it's hard to see that introduction of network neutrality regulation, especially the non-discrimination rule, would do anything to foster either outcome. Given the sophisticated applications that use the Web, such as video, gaming and peer-to-peer networking, all of which require special management techniques to work well in a crowded bandwidth environment, the FCC's forcing service providers into a "hands-off" posture, where they cannot use their own network resources to improve quality or guarantee applications performance, would quickly lead to an Internet that is neither low-cost nor open.

What's more, regulating the Internet under the guise of "network neutrality" would mark the introduction of an unprecedented level of regulation in the wireless sector, a segment that was launched with less regulation than other telecom services, and where regulation has diminished over time and American consumers have reaped tremendous benefits in the form of declining prices, increased choices of services, devices and providers. In near inverse proportion, per-minute prices have come down, usage has gone up, and service options have multiplied as have the types and capabilities of handsets. The iPhone was born not of monopoly, but in the unfettered scramble to win customers by offering new products and new applications.

Even the FCC Chairman acknowledges this. "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."[18]

Which is it? Have consumers' choice of providers "narrowed substantially," or has the choice of technologies, which would include the fiber, DSL, wireless and satellite networks built by service providers, expanded at "a dizzy pace"?

Service is still getting cheaper and more competitive while applications grow. To answer consumer demand, service providers have shown no interest in holding applications back. That's not the goal of network management, packet prioritization and applications discrimination. These tools and processes make sure that applications work. They guarantee a free and open Internet in the fullest meaning of the term. Neither the iPhone, Kindle, nor any of its successors, could function without them.

Smartphones and e-book readers are just two groups of products that are possible because service providers have the freedom to look to other parts of the value chain, mostly companies as big as or bigger than they are, for revenues that drive infrastructure investment while keeping consumer costs low. These agreements are not exploitive, and can produce a win for the manufacturer, a win for the service provider and the biggest win of all for the consumer. The government, the FCC, the industry and consumers should be wary of any rule that would take these vital tools away.

There are few areas of the economy where technological innovation occurs as rapidly as the wireless industry. Consumers have seen a staggering array of new productivity and entertainment options become available at affordable and declining prices. And it has all happened without government oversight, guidance, control or taxpayer-funded interventions of any kind. Consumers are highly satisfied, companies have not needed to be bailed out, and the prospects for further innovation are brighter than ever. It should be a source of serious concern to consumers that the federal government considers this area of private commerce to need aggressive new layers of regulatory control.

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ENDNOTES

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