



Net Neutrality vs. Net Neutering

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Regarding the recent FCC ruling upholding Net neutrality, Yogi Berra said it best: "It ain't over 'til it's over."

The US Federal Communications Commission (FCC)'s 2015 ruling on Net neutrality really didn't clarify anything:¹ although it prohibits ISPs from preferentially allocating bandwidth, bandwidth throttling, or differential pricing structures to their customers, it remains to be seen whether this latest move from the FCC will ultimately succeed.

Net neutrality—allowing access to services equally for all users and content providers irrespective of the nature of connectivity, content, or fee structure—is a core component of an open Internet. In fact, Net neutrality is actually a manifestation of the “dumb-pipe” concept of data liberation on the Internet, and, in the case of the ruling, deals solely with lawful content and users.² Content- or source-based throttling, for example, is the kind of bandwidth-handling practice the FCC is trying to prevent.

The defense of dumb-pipe networks is strongly motivated by historical experience: those seeking more control over the Internet tend to deserve less trust. Of course, there might be a middle ground: defenders of open networks could probably live with some traffic shaping if it could be conclusively demonstrated that such shaping was done transparently, and without bias toward content, source, or profit. However, such a compromise isn't likely.

BOTTOM-LINE NETWORKS

Net neutrality is opposed by those who favor corporate prerogatives, and supported by those who have an idealistic attachment to principles

like an open Internet or free speech. It's as much anathema to telecom companies as net-energy metering (NEM) is to investor-owned energy companies. The bottom line is that demand-side independence reduces profits. Period. But even if societal considerations really don't figure into the regulatory statutes, logic should.

One recent decision from Nevada's Public Utilities Commission (PUC) illustrates how illogic can buttress corporate interests through regulation. In 2015 the rooftop solar industry lost their battle with NV Energy, a powerful investor-owned energy company, in a fight to preserve the statutory rate agreements for homes with solar installations to support NEM. A serious lobbying effort was launched by the energy utilities to cripple the homeowners' advantage by increasing connection fees for them alone while lowering metering rates for homes without solar installations.

The PUC assuaged NV Energy by ruling that “it was in the public interest to develop a new tariff that establishes separate rate classes for NEM ratepayers and non-NEM ratepayers, in part because non-NEM ratepayers should not be required to subsidize NEM ratepayers.”³ Following this rococo logic, the connection fees should be charged

on the basis of the individual hookup's actual cost. Were this the norm, there wouldn't be many electrified family farms in America, and utilities subsidies to the poor, aged, and infirm would be unheard of—such activities just aren't profitable. This is preposterous. Public utilities negotiate connection fees with developers and property owners based on a balance between the cost of doing business and the public good (read: not likely to encourage blowback from regulators and elected officials) and not on actual expenses. Here, the “infrastructure cost” argument is just a convenient smokescreen for the fact that widespread rooftop solar installations would cut painfully into the private monopoly's profits. On this matter, Nevada's PUC seems to be stuck on stupid, but because it was successful, we'll probably be seeing this illogic reapplied elsewhere.

Net neutrality complicates things further because it involves both demand-side and supply-side independence from investor-based providers and their associated business

a victory than an opening salvo. The broadband lobbyists could convince Congress to rally in support of legislation that overturns this decision. Further, it's unclear whether the Supreme Court will affirm the current FCC ruling. Either way, there's big money behind reversal.

THE FCC AND THE LAW

In 2008, the FCC attempted to guarantee Net neutrality by subsuming “ancillary jurisdiction” over broadband providers' network management practices (http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-183A1.pdf). It claimed that this authority derived from US Code (Title 47, Chapter 5) Section 154(i): “The Commission may perform any and all acts, make such rules and regulations, and issue such orders, not inconsistent with this chapter, as may be necessary in the execution of its functions.” However, cable broadband provider Comcast claimed that broadband providers don't fall under Title 1 of the Communications Act of 1934, which governs common carriers, and there-

are reasonably ancillary to the Commission's effective performance of its statutorily mandated responsibilities.” The problem, the court held, was while the FCC did indeed have subject-matter jurisdiction (section 1), it didn't satisfy section 2—that the FCC's ancillary jurisdiction included Comcast's network management policies.

In response to the Comcast decision, the FCC issued the 2010 Open Internet Order (OIO) to specifically require bandwidth management transparency and prohibit blocking (protocol discrimination) and throttling by broadband providers. This time, major mobile bandwidth provider Verizon sued the FCC (*Verizon Communications Inc. v. FCC*) claiming that the OIO could only apply to Title II common carriers—referring to the section in the 1934 Communications Act that spells out federal regulations for telecoms. Once again, the Court of Appeals for the DC Circuit ruled against the FCC and vacated the anti-blocking and anti-throttling provisions.^{5,6}

That set the stage for the 2015 FCC decision. At issue was whether the broadband provider is a telecommunications service (and thus a common carrier under Title II) or an information service (under Title I). The recent FCC policy change attempts to bring broadband under the rubric of Title II provisions and thus avoid the Comcast and Verizon judicial obstacles to Net neutrality.

Immediately after the FCC ruling, a new legal strategy emerged from the broadband providers; they claim that the FCC acted arbitrarily and capriciously in subjecting broadband access to Title II authority.⁷ This argument will wind its way through the courts in 2016.

For now, the future of Net neutrality remains uncertain as Congress and the Supreme Court have yet to weigh in on the issue.

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model. The content/information providers (Netflix, Disney, Google, and so on) want an egalitarian (dumb) pipe to shield them from bandwidth surcharges and throttling. The end users want hassle-free access to bandwidth and cyberspace without nature-of-use-based pricing. Neither community is on the same page as the broadband providers.

The FCC's narrow 3-2 ruling in 2015 in support of Net neutrality was less

fore the FCC has no jurisdiction. The US Court of Appeals for the DC Circuit agreed with Comcast and vacated the FCC's 2008 ruling.⁴

In *Comcast Corp. v. FCC*, the US Court of Appeals held that “The Commission ... may exercise ancillary jurisdiction only when two conditions are satisfied: (1) the Commission's general jurisdictional grant under Title I [of the Communications Act] covers the regulated subject and (2) the regulations

WHERE IS NET NEUTRALITY HEADED?

As of this writing, Net neutrality has received a temporary show of support from the FCC in concert with the Obama administration. However, Congress, the Supreme Court, and the winner of the 2016 presidential election could individually or collectively negate this support. Are there alternative paths to achieve Net neutrality?

Having municipalities offer broadband is one proposed solution, but this is highly unlikely for the same reason that Nevada's NEM program generated corporate opposition. Public networks will be vigorously opposed by the telecom industry^{8,9} and pro-business legislatures. Further, any government attempt to encourage broadband competition (public or private) will be strongly opposed at both the state and federal levels.^{10,11}

In another 2015 ruling, the FCC indeed voted by the same 3–2 majority to preempt state laws that would prevent municipal broadband access,¹² but this position is on the same weak footing as the Net neutrality policy—in fact, they're both part of the same decision. There's no reason to think that public networks won't be contested as fiercely as Net neutrality. Just follow the money trail to see where the power lies. Some things are axiomatic in the broadband world:

- › ISPs will oppose any regulation that stifles their profit potential.¹³ They're already working through both lobbyists and the courts.⁷ In fact, the only reason Net neutrality isn't already prohibited is that two powerful business categories are on opposing sides of the issue: content providers and ISPs. Were the ISPs, their lobbyists, and industry sympathizers in Congress against the *public*, Net neutrality would already be dead.
- › In this mergers-and-acquisitions-happy sector, government encouragement of

genuine competition in broadband access is met with fierce opposition. In 2004, the Supreme Court opined in *Nixon v. Missouri Municipal League* that states can indeed prevent municipalities from offering telecommunications services.¹⁴ As long as the *Nixon* decision stands, public networks can't succeed in states in which politics are heavily influenced by business interests.

- › Municipal broadband services, just like municipal utilities and state banks, present a threat to business profits and thus, without well-organized grassroots support, face well-funded lobbyist opposition. Recall the Nevada NEM debate: ratepayers—who stood to benefit from NEM—lost to corporate interests.

While their lobbying efforts and court contests are in gestation, Net neutrality opponents won't stand still; they'll continue to look for ways around the FCC ruling. That's exactly what T-Mobile did with its Binge On video streaming service (www.t-mobile.com/offer/binge-on-streaming-video.html).

Binge On takes an interesting approach to throttling. Instead of slowing the transmission speed for some streaming video providers, it reduces bandwidth demand by lowering the resolution of the video content.¹⁵ The 2015 FCC Net neutrality ruling specifically states that ISPs “shall not impair or degrade lawful Internet traffic on the basis of Internet content, application, or service, or use of a non-harmful device, subject to reasonable network management.”¹¹ Since T-Mobile reduces video content resolution and therefore bandwidth use—even in the absence of network congestion—it appears to be in violation of the ruling. That's certainly the position of the Electronic Frontier Foundation (EFF);¹⁶ it conducted some tests and determined that T-Mobile is indeed throttling streams and downloads to 1.5 megabits per second (Mbps) by default. If this

throttling involved streaming video from providers that couldn't deliver lower video resolutions, the result was audiovisual stuttering. Concluding that there's “no optimization, and everything gets throttled,” EFF called for an FCC investigation.

But T-Mobile identifies Binge On as a *feature*, not a service. How many times have we heard that? The company says the throttling is optional: users can elect to accept Binge On with throttling so that the traffic won't count against high-speed data limits, or they can decline Binge On and pay more for the allocated bandwidth. Into this mix is another Binge On feature giving a data-cap exemption to content “partners” like Netflix and Hulu, but not others such as YouTube. The response from T-Mobile's CEO to EFF was priceless (http://money.cnn.com/2016/01/08/technology/tmobile-versus-eff/index.html?section=money_latest):

What Binge On does is not only detect the video stream but select the appropriate bitrate to optimize to the video—the mobile device. That's part A of my answer. Part B of my answer is, who the f--- are you anyway EFF? Why are you stirring up so much trouble, and who pays you?

Binge On might well be renamed “Game On,” because it portends future aggression against the FCC.

THE GIGGLE DOCTRINE

In *The Net Delusion*—arguably the definitive analysis of Net neutrality—Evgeny Morozov describes and then destroys the currently fashionable “Google Doctrine”: “The Google Doctrine—the enthusiastic belief in the liberating power of technology accompanied by the irresistible urge to enlist Silicon Valley start-ups in the global fight for freedom—is of growing appeal to many policymakers.”¹⁷ Morozov easily disposes of this naïve doctrine as another case of foolish technopomorphism

ADDITIONAL RESOURCES

- » For a thorough overview of the US Federal Communication Commission's position vis-à-vis Title II carriers, read "Net Neutrality: Selected Legal Issues Raised by the FCC's 2015 Open Internet Order," a report by Kathleen Ann Ruane for the Congressional Research Service (12 June 2015; <https://fas.org/sgp/crs/misc/R43971.pdf>).
- » For an examination of bandwidth differentiation by ISPs and an explanation of network normalization engines "Nooter" and "RotoNooter," listen to "28C3: Black Ops of TCP/IP 2011 (en)" [at 53:50], a talk by Dan Kaminsky, presented at the 2011 Chaos Computer Conference; www.youtube.com/watch?v=gQoykhNoBbY.

that seeks to imbue technology with human-like qualities such as intention. Technology is always value-neutral and thus is no more liberating than a spoon is nourishing.

Nevertheless, political arguments based on the Google Doctrine tend to involve a liberal use of catchphrases and buzzwords to manipulate public opinion. "Internet technology" doesn't refer to thousands of interconnected networks bound by a common family of protocols; it's a "magical communication and information technology that the public can be duped into believing will mysteriously solve intractable problems." Thus, to the uninitiated, invoking technology as an ideological solution has an appeal similar to invoking sorcery: because people don't expect concomitant testable empirical hypotheses, they tend to let opinions pass unchallenged. This stuff has to be taken on faith, we're told. However, unlike sorcery, the Internet has instant credibility because of its tangible value to people (email, online shopping, video chatting, and so on). So if we know it works well in some areas, it's not so hard to assume that it'll work well in others—like freeing people from tyranny.

Of course, technologists fully understand that the Internet (qua technology) is no more likely to set people free than rubbing a lamp will produce

a wish-granting genie. But the public doesn't think in these terms, and there aren't enough computing technologists giving talks on the subject to civic groups to debunk this tech-evangelism. So the agenda-driven ideologues continue to pander technopomorphism at will to manipulate public opinion. We need to get the word out: the Google Doctrine is better named the *giggle doctrine*—it's good for laughs, but that's about all.

THE NET DELUSION

Morozov's book is precisely titled: people who think the Internet will thwart government intrusion into our private lives, become a wellspring for new democracies, or empower the oppressed to overthrow tyranny are delusional. Why would information technology serve the liberator rather than the oppressor? Morozov is right on target: technology tends to serve the powerful.

Computing professionals of my vintage became acquainted with the punch-card concept by writing programs on Hollerith (IBM) cards. (Never was there a better way to substantiate a computer program than on a job deck. Today's computing students can't fully internalize the concept of correcting Damerau-type data-entry errors without mastering the use of the DUP button on a keypunch machine, but

I digress.) Herman Hollerith learned about the punch card from Charles Babbage, who in turn learned about it from Joseph Jacquard (of loom fame). The social effects of Jacquard's proposed technological panacea, *loomed* large with the Luddites in England due to the anticipation of massive job displacement for textile workers. The Luddites attacked the mill machinery, which in turn led to military suppression. At one time more British soldiers were fighting the Luddites than Napoleon. A further consequence was legislation, such as the Destruction of Stocking Frames, etc., Act of 1812, that made wrecking mechanized looms a capital crime.

There are several lessons to be learned here. First, technology like the Jacquard loom was ethically neutral. Although it displaced mill workers (a societal loss), it also lowered the price of textiles and increased the profitability of the industry and the expansion of the mercantile class (a societal gain). Second, loom automation led to additional advances in the Industrial Revolution that in turn contributed to human convenience and increased quality of life. Third, the Luddite movement did nothing to end or diminish the power elite's control over workers' lives. The government called in the military to suppress dissenters just as earlier militias suppressed agrarian reformers. There was nothing new in this result. Finally, the Luddites put too much emphasis on technology, rather than the political system, as their adversarial target. Millwrights of the time certainly saw Jacquard's creation as the ultimate solution to rising labor costs; thus the loom's maleficence was the giggle doctrine of 19th-century England.

Flash forward to the Iranian Twitter Revolution of 2009. As Morozov documents, the bogus claims that no bullet could stand up to billions of bits led to media hysteria; the illiterati proclaiming that tweets were game changers, and Iran would undergo a revolution as radical as that of 1979. Not so. The

power elite prevailed as it usually does. Reformist Mir-Hossein Mousavi wasn't elected president of Iran, the Green Movement went dormant, dissidence was met with violent suppression, and authoritarianism prevailed. Tyranny, not Twitter, won the day.

Let's examine the key contributions to such popular uprisings: it's more likely that the samizdat materials, open-minded university students, hunger strikes, and the like will move the needle than any identifiable technology. Underground movements make no better use of technology than oppressive governments. In fact, Morozov suggests that the Internet might have hindered Iran's Green Movement more than helped it.¹⁷

So that's the lay of the land. Big money is behind Net neutering, not Net neutrality. The current Congress isn't likely to oppose these interests. The Supreme Court is an unknown at this writing. The prevailing view appears to be that government must avoid intrusion into the broadband industry's business objectives, even if so doing would be counter to public interest. As it stands, the FCC and the Obama administration are the most vocal dissenters.

Computing professionals, information technologists, and tech innovators would be well advised to stay informed on this important issue (see "Additional Resources" sidebar) and to keep the pressure on politicians to prevent further erosion of Net neutrality, for the sake of both our professional future and the public interest. ■

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