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The FCC Should Keep Broadband Free From Analog-Era Outage Regulations

by

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Transition from the earlier monopolistic analog communications world to the current competitive digital communications world calls for a pro-competitive policy that places primary emphasis on market forces to incentivize the provision of reliable and innovative services. But the Federal Communications Commission's rulemaking proposal to subject Voice over Internet Protocol (VoIP) providers and broadband Internet Service Providers (ISPs) to network outage reporting requirements is premised on a pro-regulatory approach ill-suited to the 21st Century technological and competitive marketplace. This is but yet one more example of the FCC's proclivity to import legacy regulations into today's IP world when doing so makes little or no sense.

At bottom, the FCC's proposed rulemaking is a monopoly-era legacy regulatory measure. It would carry over rules initially created to address problems pertinent to analog circuit-switched telephone calls to today's diverse and competitive digital communications services marketplace. Technological innovation, including the unique characteristics of digital broadband networks, limit the occurrence and scope of outages experienced by end users in a way that renders such a carry-over ill-advised.

Federal law requires Internet Protocol-enabled communications service providers to make 911 and enhanced 911 (e911) services available to end users.[1] And the combination of competition and innovation in IP-enabled and broadband communications services suggests that VoIP providers and broadband ISPs should continue to have the marketplace flexibility to pursue network management solutions to ensure network reliability, including 911 and e911 reliability. But the outage reporting rules proposed by the FCC would saddle Internet Protocol-based communications with a slew of costly and burdensome mandates that outweigh any perceived long-term benefits.

A demonstrated market failure or anticompetitive conduct posing actual harm to consumers may justify regulatory redress where the benefits of narrowly targeted regulation outweigh the costs, and where no less intrusive alternatives to address anticompetitive concerns are available.

When it comes to 911 and e911 services, however, the FCC has not made any showing that the VoIP and broadband Internet access and backbone markets are failing to deliver reliable 911 or e911 services, or that those markets are failing to incentivize reliable provision of these services. Nor did the FCC's notice contain any attempt at a cost-benefit analysis to establish that the burdens resulting from the Commission's proposed regulations outweigh their supposed benefits. Voluntary efforts by industry as well as inter-agency public-private partnerships already in existence offer a better approach for ensuring the reliability of such emergency communications services.

The FCC's Part 4 Rules for Reporting Network Outages

In its *1992 Part 4 Report and Order*, the FCC established network outage reporting requirements for providers of common carrier services.[2] And in 2004, the Commission extended those requirements to providers of wireless, cable, and satellite communications.[3]

Under the FCC's Part 4 rules, within two hours of discovering a reportable outage voice providers must submit a Notification to the Commission. Voice providers must also file an Initial Report within 72 hours of an outage discovery, as well as a Final Report within 30 days time.[4] The FCC's Part 4 rules define an "outage" as "a significant degradation in the ability of an end user to establish and maintain a channel of communications as a result of failure or degradation in the performance of a communications provider's network."[5] The rules set service level thresholds for reportable outages, with definitions of a reportable significant degradation tailored to different types of communications technologies, such as cable, telephony carrier tandem, satellite, or wireless.[6] In the case of wireline facilities, instances where reporting is mandated include outages of 30 minutes or more on facilities that "[p]otentially affects at least 900,000 user minutes of either telephony or paging" or potentially affect other special facilities.[7]

The Proposal to Impose Outage Regulations on VoIP Providers and ISPs

As the FCC's notice explains, "[c]urrently, only providers of legacy circuit-switched voice and/or paging communications over wireline, wireless, cable, and satellite communications services must report communications outages."[8] The FCC's National Broadband Plan, however, recommended extending the Part 4 outage reporting rules to interconnected VoIP providers and broadband ISPs.[9] And so this past May the FCC issued a proposed rulemaking to extend the outage reporting requirements in Part 4 of its rules regarding 911 and e911 to providers of VoIP services and broadband ISPs, including Internet backbone service providers.[10]

The FCC claims that its "analysis of industry-wide outage reports has led to improvements in the engineering, provisioning, and deployment of communications infrastructure and services."[11] The Commission insists that its extension of outage reporting rules to VoIP providers and Broadband ISPs "will allow the Commission to use the same successful process it currently uses with wireline and wireless providers to refine networks better for emergency situations."[12] In particular, the FCC states that information provided in mandated reports would help it to "determine the extent of the problem nationwide, identify recurring problems, determine whether action can be taken immediately to help providers recover or prevent future outages, and ensure to the extent possible that broadband networks are prepared for natural and man-made disasters."[13]

The FCC's proposal for defining reportable outages for VoIP and broadband ISPs would be based, in part, on quality of service criteria. It proposes to establish detailed service metrics like packet loss, latency, and jitter specific to the particular type of broadband-related technology.[14] For VoIP providers, the FCC is contemplating requiring reports when outages or service disruptions last at least 30 minutes on major facilities or "potentially" affect at least 900,000 user minutes.[15]

For broadband ISPs, the FCC similarly contemplates requiring reports where outages last 30 minutes on any major facility or potentially affect at least 900,000 user minutes.[16] For broadband Internet access providers, in particular, the FCC is also considering whether to define "loss of generally-useful availability and connectivity" based on quality of service metrics for packet loss, round-trip latency, or jitter. According to the notice, "packet loss of one percent or more, round-trip latency of 100 ms or more, or jitter of 4 ms or more from the source to the destination host" would trigger reporting requirements.[17] Thus, when service levels drop below the Commission's standards, providers would be required to file reports, even if end users do not actually experience loss of service. For mobile VoIP providers and broadband ISPs providing backbone services, the FCC is also considering the failure of communications equipment like core routers and network servers as a trigger for reporting requirements.[18]

Pro-Regulatory Policy vs. Pro-Competition Policy

When a market undergoes rapid and dramatic change, the basic regulatory approach to that market should be reflective of that change. And where market conditions move from monopolistic to competitive, regulatory policy should no longer be dictated from a pro-regulation playbook. Markets characterized by competition should be accompanied by a pro-competitive policy approach that, without regulatory restraints, provides incentives for continued innovation, investment, and competition. A pro-competitive outlook is especially important where markets are dynamic and characterized not only by increased competition but by disruptive changes brought about by innovative technologies and business models.

A pro-competition approach looks to the forces of free market competition as the primary means for incentivizing and disciplining providers to ensure the availability of superior service and price options to consumers. Under a pro-competition approach, regulation is limited to those instances where there is a demonstrable market failure or harm to consumers, where the benefits of establishing clear and narrowly-targeted regulation outweigh the costs, and where no less intrusive means are available.

When it comes to digital communications, the ongoing transition from monopoly-era analog technologies should coincide with a transition to more limited regulatory controls. Today's broadband-centric market for digital communications calls for a pro-competitive policy that encourages further innovation, investment, and competition through Internet-connected and IP-enabled services free from outdated, unnecessary, and burdensome regulatory restraints. Unfortunately, the FCC’s proposal to impose outage reporting requirements on VoIP providers and broadband ISPs is in keeping with a pro-regulatory approach that must be avoided if the Internet is to achieve its fullest potential as an engine of innovation and economic prosperity.

Competition and Innovation Render Outage Reporting Rules Unnecessary for VoIP and Broadband Internet Services

When the FCC adopted its Part 4 rules in the early 1990s, the vast majority of consumers were reliant on a single local exchange provider operating highly centralized circuit-switched networks. An outage could easily impact enormous numbers of consumers and leave them without any significant alternative channel of communication. As competition grew in local and long distance services, interfacing between new technologies and competitors and the public switched telephone network (PSTN) also resulted in outage incidents. In that unique context, the FCC's requirements that common carriers report network outages to help the FCC facilitate best practices and reduce outages had stronger plausibility claims.

But the communications landscape has changed dramatically over the last several years. The PSTN is now on the way out, with the FCC hosting December 2011 workshops on PSTN retirement issues.[19] As the FCC's notice points out, "broadband

technologies…are fast becoming substitutes for communications services provided by older, legacy communications technologies."[20] The FCC's *Local Telephone Competition Report*s chronicle the steady decline in the total number of switched access lines in recent years. This drop has coincided with a steady increase in VoIP subscriptions. As the FCC's notice points out, "[a]s of June 30, 2010, 28 percent of the more than 89 million residential telephone subscriptions were provided by interconnected VoIP providers—an increase of 27 percent (from 19.9 million to 25.2 million) in the last year."[21]

Consumers today enjoy a multiplicity of IP-enabled communications service choices from competing communications service providers, including traditional wireline telcos, cable companies, wireless carriers, and over-the-top VoIP providers riding on the backs of broadband ISP networks. As a result, even in the event of an outage in one particular service or in a particular geographic area, end users are likely to have access to alternative sources for communications services, including 911 and e911.

Technical design aspects of broadband networks also have implications for the delivery of 911 and e911 services that differentiate digital networks from legacy systems. As the FCC acknowledges in its notice, "[b]roadband networks operate differently than legacy networks, so the impact of outages is likely to be different."[22]

Unlike circuit-switched systems that establish a dedicated transmission path between end users, broadband packet-switched systems use no specific path but instead use numerous paths across networks. As a result, packet-switching can avoid the effects of problems in one part of a network and allow end-users to communicate with little or no discernable disruption. Furthermore, broadband networks have built-in redundancies in infrastructure and equipment such as fiber rings and routers that automatically reroute information-storing data packets in the event of network disruption. Redundant cell towers and fiber backhaul paths to switching centers are also among the network reliability features employed by wireless broadband ISPs. Backup power supplies are also routinely used by broadband ISPs.

These redundancies built into broadband networks reduce the likelihood that end users will experience any loss of service. Such networks are also architecturally designed to decrease the scope or number of end users experiencing outages. Thus, broadband network outages are more likely to be limited in geographical scope than legacy system outages.

So rapid growth in market competition and technological innovation have profound implications for emergency communications. 911 services have become more ubiquitous. And e911 services that were unknown when the FCC first established its Part 4 rules in the early 1990s are now available.

However, the FCC apparently has little regard for these changes. The FCC contends that imposing outage requirements on VoIP providers and broadband ISPs is consistent with other regulations it has adopted in recent years reflecting consumers' growing

reliance on broadband technologies – such as requiring VoIP providers to transmit 911 calls and offer customers e911 capabilities.[23]

Of course, the mere existence of prior regulations doesn't justify the addition of even more regulations. But the more salient point is that the FCC's pro-regulatory proposal for imposing mandates on VoIP providers and broadband ISPs is inconsistent with the kind of policy approach that actual conditions in the market calls for.

Providers of IP-enabled communications services such as VoIP are already required by statute to reliably provide 911 and e911 services. Consistent with a pro-competitive policy for advanced telecommunications services, the FCC should allow providers to undertake their own best efforts to meet their mandate without imposing costly reporting requirements that offer negligible benefits.

Claims That the Market Fails to Incentivize Reliable Service Are Unsupported

In its notice, the FCC does make something nearing a market failure argument to rationalize its pro-regulatory proposal. It says the "[t]he economic justification to ensure such service appears to be limited, and does not consider network externalities."[24] This assertion is bereft of any supporting evidence or analysis. It is also difficult to take seriously because VoIP providers and broadband ISPs have incentives to provide reliable services to end users and to avoid service outages. Otherwise, they will lose goodwill and frustrated end users will migrate to competitors' services.

The FCC likewise asserts that "even if incentives did motivate individual market participants to optimize their own reliability, they do not necessarily optimize systemic reliability."[25] When it comes to modern technology industries, including broadband Internet-related services, optimization almost always involves consideration of numerous constraints and trade-offs owing to the limits on technological availability and capability. If "optimization" is the touchstone for regulatory intervention, then the FCC could insist on regulatory action in nearly any circumstance where it is inclined to second-guess the engineering or business model decisions made by service providers in the market. In the end, arguments for regulatory second-guessing of design and operational decisions involving broadband networks and services technology fail to show market failure or lack of market incentives to justify the FCC's proposed outage report regulations.

Moreover, the FCC's emphasis upon optimizing "systemic reliability" appears misplaced and a throwback to legacy regulation of traditional analog systems. As pointed out earlier, while "systemic reliability" is of critical importance to the functioning of circuit-switched systems, the rerouting features of packet-switched broadband networks and built-in redundancies reduce the effects of any network disruptions, drastically reducing the risk of systemic failures. And the ready availability of alternative communications platforms reduces the criticality of a single network outage.

Reliability of 911 and e911 service, and therefore reliability of IP-enabled communications and broadband networks, should ultimately be gauged from the perspective of the end user. The FCC's proposed rulemaking, however, appears to be gauged from the perspective of a superintending regulator overseeing the intricate details of the Internet's infrastructure, transmission and content layers, and all its varied device connections and applications operations. An end user perspective also suggests it would be a mistake for the FCC to impose reporting requirements in the event of communications equipment failure where such failure has little or no discernible impact on the service provided to end users.

The FCC Avoids Rigorous Cost-Benefit Analysis

Failure to demonstrate an actual problem also makes it more difficult to weigh the costs and benefits of regulations meant to address a supposed problem. Indeed, the FCC could have gathered information in the course of its proceeding on public safety and best practices for 911 and e911 services to undertake a cost-benefit analysis that would presumably form the basis of any future agency action regarding reliable 911 and e911 services.[26] But the FCC passed up that chance. Although the FCC sought comment on the relative costs and benefits of its proposed rulemaking, its notice provided no such analysis.

Instead, the FCC proposes a set of regulations after summarily stating that it thinks the costs of its rules would be minimal. But the FCC's optimistic claims about the amount of administrative time and costs relating to its rules hinge on unreliable assumptions about the pervasiveness and particularity of VoIP providers' and broadband ISPs' monitoring of network functions.

The FCC's proposal for defining reportable outages includes not just total loss of service but detailed service metrics like packet loss, latency, and jitter. In its notice, the FCC contemplates adopting a myriad of different metrics, based on the particular type of broadband-related technology utilized. Reporting requirements would be triggered when services drop below the FCC's established thresholds and if they last at least 30 minutes and "potentially" affect 900,000 or more user minutes. While admitting "the apparent lack of standardized values for the metrics presented here,"[27] the FCC nonetheless posits its own set of standards. It suggests, for instance, that "packet loss of one percent or more, round-trip latency of 100 ms or more, or jitter of 4 ms or more from the source to the destination host" trigger outage reports.[28]

Broadband ISPs do not routinely monitor ongoing network activity with the level of precision that the FCC appears to take for granted. In countless instances, spikes in packet loss, latency, or jitter are the result of events outside the control of broadband ISPs, given the multi-layered structure of the Internet with connected devices and applications running over the top, as well as the frequency with which end user communications travel across multiple networks. (For that matter, interconnected VoIP providers may not be an end user's broadband access provider or its handset manufacturer, and almost certainly not the end user's electric power company. So VoIP

providers are certainly not well positioned to ascertain the source and cause of disruptions that exist beyond their control.) Installing specific but network-wide monitoring capabilities and protocols involves implementation and operational costs that belie the FCC's assertion that its outage reporting regulations costs would be minimal. And, of course, monitoring for packet loss, latency, and jitter anomalies throughout entire broadband networks does not by itself make the provision of 911 and e911 services more reliable.

If FCC Chairman Julius Genachowski is serious about his stated commitment to implement the substance of Executive Order 13579 and only adopt regulations justified by a cost-benefit analysis,[29] he should make good on that commitment in this proceeding. Admittedly, cost-benefit analysis can be difficult in many instances. Social policy objectives can be complex, or sometimes even impossible to quantify. And at times weighing competing alternatives involves greater resort to common sense judgment in light of regulatory philosophy than to empirical data. But in this case the FCC made no serious attempt at a cost-benefit analysis in proposing outage reporting requirements for VoIP providers and broadband ISPs.

As it now stands, the better approach is for the FCC to look to voluntary cooperative efforts regarding outage reporting and best practices to ensure network reliability as well as 911 and e911 reliability. There are already a number of existing industry and inter-agency private partnerships addressing issues of network reliability and emergency communications. They include the FCC-created Communications, Security, Reliability, and Interoperability Council ("CSRIC"), the government-industry partnering National Coordinating Center (“NCC”), as well as industry organizations such as the Communications Sector Coordinating Council ("CSCC").

Conclusion

Differences between analog-based legacy systems and digital broadband Internet networks call for a pro-competitive policy rather than a pro-regulatory policy. Today's innovative and competitive markets call for less regulation, rather than new regulation based on outdated conceptions of the market.

The FCC's proposal to subject VoIP providers and broadband ISPs to network outage reporting regulations takes a decidedly pro-regulatory approach. But market alternatives now available to consumers mean that rules created to address problems pertaining to the monopoly-era, analog circuit-switched telephone network make little sense today. The unique characteristics of broadband IP networks also limit the occurrence and scope of outages experienced by end users.

Federal law already requires IP-enabled communications service providers to make 911 and e911 services available to end users. VoIP providers and broadband ISPs should continue to have the marketplace flexibility to pursue network management solutions to ensure network reliability. But the outage reporting rules proposed by the FCC would

saddle IP-based communications with a slate of costly and burdensome mandates that outweigh any claimed long-term benefits.

The FCC has not made any showing that the VoIP and broadband Internet access and backbone markets are failing to deliver reliable 911 or e911 services, or that those markets are failing to incentivize reliable provision of those services. Voluntary efforts by industry and public-private partnerships already in existence offer a better approach for ensuring the reliability of emergency communications services.

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[1] *See* 47 U.S.C. § 615a-1. The current statutory requirements were established by the New and Emerging Technologies 911 Improvement Act of 2008, P.L. 110-283 (July 23, 2008).
[2] Notification by Common Carriers of Service Disruptions, CC Docket No. 91-273, Report and Order, 7 FCC Rcd 2010 (1992).
[3] *See* Report and Order and Further Notice of Proposed Rule Making, New Part 4 of the Commission's Rules Concerning Disruptions to Communications), ET Docket No. 04-35 (2004).
[4] *See* Notice of Proposed Rulemaking ("Notice"), In the Matter of The Proposed Extension of Part 4 of the Commission's Rules Regarding Outage Reporting to Interconnected Voice Over Internet Protocol Service Providers and Broadband Internet Service Providers, PS Docket No. 11-82, at ¶ 61 (released May 13, 2011), available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-11-74A1.pdf; 47 C.F.R. § 4.11.
[5] 47 C.F.R. § 4.5(a).
[6] *See* 47 C.F.C. § 4.9(a)-(f).
[7] Notice, at 14, ¶ 27 fn. 69 (quoting 47 C.F.R. § 4.9(f)).
[8] Notice, at para 10.]
[9] Omnibus Broadband Initiative, Connecting America: The National Broadband Plan, Recommendation 16.6 (March, 2011).
2010) (NBP).
[10] *See* Notice, at ¶¶ 26-50.
[11] Notice, at ¶ 10. *See also id*., at ¶ 16.
[12] Notice, at ¶ 11.
[13] Notice, at ¶ 11.
[14] *See* Notice, at ¶¶ 29, 42-43.
[15] *See* Notice, at ¶ 29.
[16] *See* Notice, at ¶ 43.
[17] Notice, at ¶ 42.
[18] *See* Notice, at ¶ 28 and ¶ 49.
[19] *See* Public Notice: "FCC Workshops on the Public Switched Telephone Network in Transition" (November 10, 2011), available at:
http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db1110/DA-11-1882A1.pdf.
[20] Notice, at ¶ 2.
[21] Notice, at ¶ 2.
[22] Notice, at ¶ 27.
[23] *See* Notice, at ¶ 23.
[24] Notice, at ¶ 20.
[25] Notice, at ¶ 20.

[26] *See* Public Notice: "FCC'S Public Safety and Homeland Security Bureau Reminds Telecommunications Service Providers of Importance of Implementing Advisory Committee 9-1-1 and Enhanced 9-1-1 Services Best Practices," DA 10-494 (released March 24, 2010).
[27] Notice, at ¶ 42.
[28] Notice, at ¶ 42.
[29] *See* Exec. Order No. 13579 (Jul. 11, 2011), available at: http://www.gpo.gov/fdsys/pkg/FR-2011-07-14/pdf/2011-17953.pdf; Press Release: "Statement from FCC Chairman Julius Genachowski on the Executive Order on Regulatory Reform and Independent Agencies" (July 11, 2011), available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-308340A1.pdf. *See also* Exec Order No. 13563 (Jan. 18, 2011), available at: http://www.gpo.gov/fdsys/pkg/FR-2011-01-21/pdf/2011-1385.pdf.