

Before the
Federal Communications Commission
Washington, D.C. 20554

MAILED
FEB 24 2012
FCC Mail Room

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

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REPORT AND ORDER

Adopted: February 15, 2012

Released: February 21, 2012

By the Commission: Chairman Genachowski and Commissioners McDowell and Clyburn issuing
separate statements.

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I. INTRODUCTION AND SUMMARY

1. In this *Report and Order*, the Federal Communications Commission (FCC or Commission) extends the outage reporting requirements in Part 4 of our rules¹ only to interconnected Voice over Internet Protocol (VoIP) service providers.² In the *Notice of Proposed Rulemaking* in this proceeding,³ we proposed to take much broader action. Specifically, we proposed to extend Part 4 of the rules to both interconnected VoIP services and broadband Internet services. In addition, we proposed to require reporting of both outages based on the complete loss of service and those where, while service is technically available, technical conditions (such as packet loss, latency and/or jitter) effectively prevent communication. In response to the record developed in this proceeding, we are prepared at this time to adopt reporting requirements only with respect to the complete loss of interconnected VoIP service. Collecting this data will help the Commission help ensure the Nation's 9-1-1 systems are as reliable and resilient as possible and also allow us to monitor compliance with the statutory 9-1-1 obligations of interconnected VoIP service providers. At this time, we also defer action on possible performance degradation thresholds for measuring an outage of interconnected VoIP service and on all outages of broadband Internet service.

2. Consumers are increasingly using interconnected VoIP services in lieu of traditional telephone service.⁴ Interconnected VoIP services allow a wireline or wireless user generally to receive calls from and make calls to the legacy public telephone network, including calls to 9-1-1.⁵ As of December 31, 2010, 31 percent of the more than 87 million residential telephone subscriptions in the

¹ 47 C.F.R. Part 4.

² The rules we adopt today modify information collection to OMB No. 3060-0484 (approved Nov. 16, 1991). The Commission will issue a public notice announcing the effective date of the information collection after the Office of Management and Budget approves the modification.

³ See 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, *Notice of Proposed Rulemaking*, PS Docket No. 11-82, 26 FCC Rcd 7166 (2011) (*NPRM*).

⁴ See *Local Telephone Competition: Status as of December 31, 2010*, Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission (Oct. 2011), Figure 1 - Interconnected VoIP Subscriptions and Retail Switched Access Lines, 2008 - 2010, available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db1007/DOC-310264A1.pdf, (last visited Feb. 2, 2012). For example, during the period December 2008 to December 2010 residential and business interconnected VoIP subscriptions increased from 21,744,000 to 31,674,000 (+46 percent) while legacy residential and business telephone lines decreased from 141,019,000 to 116,898,000 (-17 percent).

⁵ Section 9.3 of the Commission's Rules defines "Interconnected VoIP service" as "a service that: (1) Enables real-time, two-way voice communications; (2) Requires a broadband connection from the user's location; (3) Requires Internet protocol-compatible customer premises equipment (CPE); and (4) Permits users generally to receive calls that originate on the public switched telephone network." 47 C.F.R. § 9.3.

United States were provided by interconnected VoIP providers⁶—an increase of 21 percent (from 22.4 million to 27.1 million residential lines) in the last year.⁷ The public's increased reliance on interconnected VoIP services is also reflected in 9-1-1 usage trends; we estimate that approximately 31 percent of residential wireline 9-1-1 calls are made using VoIP service.⁸

3. The availability and resilience of our communications infrastructure, specifically 9-1-1, directly impacts public safety and the ability of our first responders to fulfill their critical mission. The most practical, effective way to maintain emergency preparedness and readiness is to work continuously to minimize the incidence of routine outages.

4. The FCC's public safety mission is one of our core functions, and "promoting safety of life and property" is a foundational reason for the creation of the Commission.⁹ More recently, Congress affirmed the Commission's efforts to accomplish this mission by codifying the requirement for interconnected VoIP providers to provide 9-1-1 services.¹⁰

5. Consistent with our statutory mission, Presidential Directives and Executive Orders, and related implementing documents charge the Commission with ensuring the resilience and reliability of the Nation's commercial and public safety communications infrastructure. National Security Presidential Directive/NSPD-51¹¹ establishes the framework by which the government can continue to perform its most critical roles during times of emergency.¹² Accordingly, the Commission has the responsibility to

⁶ See *Local Telephone Competition: Status as of December 31, 2010*, Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission (Oct. 2011), Figure 2 - Wireline Retail Local Telephone Service Connections by Technology and Customer Type as of December 31, 2010, available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db1007/DOC-310264A1.pdf (last visited Feb. 2, 2012).

⁷ See *Local Telephone Competition: Status as of December 31, 2009*, Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission (Jan. 2011), Figure 2 - Wireline Retail Local Telephone Service Connections by Technology and Customer Type as of December 31, 2009, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-304054A1.pdf. (last visited Feb. 2, 2012).

⁸ See *supra* notes 4-6. The FCC estimates that the percentage of residential wireline VoIP calls to 9-1-1 will be approximately equal to the percentage of residential wireline VoIP telephone subscriptions when compared to the total residential wireline telephone subscriptions. See *Local Telephone Competition: Status as of December 31, 2010*, Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission (Oct. 2011), Figure 2 - Wireline Retail Local Telephone Service Connections by Technology and Customer Type as of December 31, 2010, available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db1007/DOC-310264A1.pdf. (last visited Feb. 2, 2012). The FCC estimates that the percentage of residential wireline VoIP calls to 9-1-1 will be approximately equal to the ratio of residential wireline VoIP telephone subscriptions (27.061M) to the total residential wireline telephone subscriptions (87.088M), *i.e.*, 27.061M/87.088M or 31 percent.

⁹ See 47 U.S.C. § 151.

¹⁰ See 47 U.S.C. § 615a-1.

¹¹ National Security Presidential Directive 51 (NSPD 51), also known as Homeland Security Presidential Directive-20 (HSPD-20) (May 9, 2007), available at <http://www.fas.org/irp/offdocs/nspd/nspd-51.htm> (last visited Feb. 6, 2012).

¹² NSPD 51/HSPD-20 provides a rapid and effective response to and recovery from a national emergency. It establishes the policy on the continuity of Federal government structures and operations. It also establishes "National Essential Functions" (NEFs), which prescribe continuity requirements for all executive departments and agencies to ensure that our constitutional government endures. NEFs include: 1) providing rapid and effective response to and recovery from the domestic consequences of an attack or other incident; and 2) providing for critical (continued....)

ensure continuous operations and reconstitution of critical communications and services.¹³ The Commission also plays an active role in Emergency Support Function 2 (ESF2),¹⁴ the communications branch of the National Response Framework,¹⁵ which guides the Nation's conduct during an all-hazards response. Executive Order 12472 establishing the National Communications System, the functions of which include coordination of the planning for and provision of national security and emergency preparedness communications for the Federal government, also requires FCC participation.¹⁶

6. We have cause to be concerned about the ability of interconnected VoIP subscribers to reach emergency services when they need them. Several recent, significant VoIP outages highlight our concern about the availability of 9-1-1 over VoIP service:

- On May 25, 2010, according to press reports, a service outage involving the AT&T U-Verse platform involved a server failure that impacted U-Verse interconnected VoIP service in AT&T's entire 22-state local phone service area serving approximately 1.15 million customers. The reports indicate that the outage lasted for several hours. It remains unclear how many subscribers were unable to reach 9-1-1 and for how long.¹⁷
- On March 22, 2011, a Comcast outage in 19 New Hampshire communities beginning around 3:30 p.m. left many Comcast customers in those communities unable to make any calls, including 9-1-1 calls. The problem lasted through the evening.¹⁸
- In June 2010, CenturyLink Internet experienced failures that affected approximately 30,000 customers on the Kitsap Peninsula (near Seattle, Washington),¹⁹ and in a separate

(Continued from previous page)

Federal Government services that address the health, safety and welfare needs of the United States. NSPD 51/HSPD-20 (May 4, 2007), ¶ 5.

¹³ See description of the Commission's work with respect to emergency communications: <http://www.fcc.gov/topic/emergency-communications> (last visited Feb. 13, 2012).

¹⁴ ESF2 supports the restoration of the communications infrastructure, facilities, the recovery of systems and applications from cyber attacks, and coordinates Federal communications support to response efforts during incidents requiring a Federal response. See <http://www.fema.gov/pdf/emergency/nrf/nrf-esf-02.pdf> (last visited Feb. 2, 2012).

¹⁵ The National Response Framework was developed by the U.S. Department of Homeland Security (DHS) pursuant to Homeland Security Presidential Directive-8 (HSPD-8). This Directive was enacted to strengthen the preparedness of the United States to prevent and respond to threatened or actual domestic terrorist attacks, major disasters, and other emergencies by requiring a national domestic all-hazards preparedness goal, establishing mechanisms for improved delivery of Federal preparedness assistance to State and local governments, and outlining actions to strengthen preparedness capabilities of Federal, State, and local entities. Homeland Security Presidential Directive-8 (Dec. 17, 2003), replaced by Presidential Policy Directive 8 (March 30, 2011), available at http://www.dhs.gov/xabout/laws/gc_1215444247124.shtm (last visited Feb. 6, 2012).

¹⁶ See *Amendment of Part 63 of the Commission's Rules to Provide for Notification by Common Carriers of Service Disruptions*, CC Docket No. 91-273, Report and Order, 7 FCC Red 2010, 2016-17 ¶¶ 33-34 (1992) (1992 Part 4 Report and Order).

¹⁷ See Mike Dolan *AT&T's VoIP suffers outage*, FierceVoIP, May 27, 2010, available at <http://www.fiercevoip.com/story/ts-voip-suffers-outage/2010-05-27> (last visited Feb. 7, 2012).

¹⁸ See TCMNet, *Phone outages leave 19 communities without 911 for hours*, March 23, 2011, available at <http://www.tmcnet.com/usubmit/2011/03/23/5396533.htm> (last visited Feb. 7, 2012).

¹⁹ See Derek Sheppard, *Internet Outages Frustrate Businesses, Web Surfers in North Kitsap*, Kitsap Sun, June 4, 2010, available at <http://www.kitsapsun.com/news/2010/jun/04/scattered-internet-outages-frustrate-businesses/> (last visited Feb. 7, 2012).

outage, affected approximately 100,000 customers across parts of Texas.²⁰ The Kitsap Peninsula outage lasted an hour according to company sources, but some customers said it lasted four times as long.²¹ The Texas outage lasted over eight hours. During the outages, consumers, businesses and government were unable to place 9-1-1 or other calls over VoIP.

- In March 2010, Comcast Internet and Digital Voice service was disrupted to customers in Nashville, Tennessee, and Atlanta, Georgia. Comcast customers experienced severely degraded service for at least two hours.²² During the outage, local, state, and Federal government department and agency customers of Comcast in the affected areas were unable to make or receive telephone calls. Residential and business subscribers to Comcast Internet and Digital Voice services also were affected by the outage significantly impairing their ability to engage in 9-1-1 and other communications.

7. Commission staff gathered these facts from press accounts. None of these outages was reported directly to the Commission. The current outage reporting requirements are limited to traditional voice and paging communications services over wireline, wireless, cable, and satellite and do not apply to outages affecting interconnected VoIP services.²³ Obtaining outage information for interconnected VoIP service, however, is the most effective method for the Commission to know whether and how well providers are meeting their statutory obligation to provide 9-1-1 and Enhanced 9-1-1 (E9-1-1) service.²⁴ Further, without detailed information about outages that occur, the Commission is unable to analyze communications vulnerabilities, especially as they pertain to 9-1-1 services, or to share aggregate information with industry to help prevent future outages.

²⁰ See Dave Miller, *Century Link down across region*, Killeen Daily Herald, June 17, 2010, available at <http://www.kdhnews.com/news/story.aspx?s=42355> (last visited Feb. 7, 2012).

²¹ See infoTECH News, *Scattered Internet Outages Frustrate Businesses, Web Surfers in North Kitsap*, June 4, 2010, available at <http://it.tmcnet.com/news/2010/06/04/4828578.htm> (last visited Feb. 7, 2012).

²² See Fred Posner, *Comcast Outage and Phone Service Complaints*, VoIP Tech Chat, March 29, 2010, available at <http://www.voiptechchat.com/voip/431/comcast-outage-and-phone-service-complaints/> (last visited Feb. 7, 2012).

²³ See 47 C.F.R. §§ 4.1-4.13. In 1992, the Commission established network outage reporting requirements for wireline providers. *1992 Part 4 Report and Order* 7 FCC Rcd 2010 (1992); see also *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 8 FCC Rcd 8517 (1993); *Second Report and Order*, FCC Rcd 39-1-1 (1994); *Order on Reconsideration of Second Report and Order*, 10 FCC Rcd 11764 (1995). In 2004, the Commission extended these reporting requirements to providers of wireless, cable, and satellite communications. *New Part 4 of the Commission's Rules Concerning Disruptions to Communications*, ET Docket No. 04-35, *2004 Part 4 Order and FNPRM*, 19 FCC Rcd 16830 (2004) (*2004 Part 4 Order and FNPRM*).

²⁴ Section 615a-1(a) of the Communications Act provides that

“[i]t shall be the duty of each IP-enabled voice service provider to provide 9-1-1 service and enhanced 9-1-1 service to its subscribers in accordance with the requirements of the Federal Communications Commission, as in effect on July 23, 2008 and as such requirements may be modified by the Commission from time to time.”

47 U.S.C. § 615a-1.

8. With the objective of ensuring the availability of 9-1-1 service, this Report and Order:
- extends the Commission's mandatory outage reporting rules to facilities-based and non-facilities-based²⁵ interconnected VoIP service providers;
 - applies the current Part 4 definition of an outage to outages of interconnected VoIP service, covering the complete loss of service and/or connectivity to customers;
 - requires that these providers submit electronically a notification to the Commission within:
 - 240 minutes of discovering that they have experienced on any facilities that they own, operate, lease, or otherwise utilize, an outage of at least 30 minutes duration that potentially affects a 9-1-1 special facility,²⁶ in which case they also shall notify, as soon as possible by telephone or other electronic means, any official who has been designated by the management of the affected 9-1-1 facility as the provider's contact person for communications outages at that facility;
 - in this case, the provider shall convey to that person all available information that may be useful to the management of the affected facility in mitigating the effects of the outage on efforts to communicate with that facility; or
 - 24 hours of discovering that these providers have experienced on any facilities that they own, operate, lease, or otherwise utilize, an outage of at least 30 minutes duration that:
 - potentially affects at least 900,000 user minutes of interconnected VoIP service and results in complete loss of service; or
 - potentially affects any special offices and facilities;²⁷
 - requires that these providers submit electronically a Final Communications Outage Report to the Commission not later than thirty days after discovering the outage; and
 - clarifies that the Part 4 rules apply to voice services provided using new wireless spectrum bands.

²⁵ See *Clarification of § 83.61 International Traffic Data Reporting Requirements*, 13 F.C.C.R. 12809, 12810 (Int. Bur. 2008) (defining "facilities-based" service as a service provided using channels of communication that the carrier owns, or in which the carrier has some other possessory interest, such as an indefeasible right of use (IRU) or a lease).

²⁶ See 47 C.F.R. § 4.5(e).

²⁷ See 47 C.F.R. § 4.5(b).

9. The outage reporting threshold that we adopt today for interconnected VoIP service is technology-neutral in that it mirrors the existing standard applied to other services covered under Part 4 of the Commission's rules. Furthermore, the reporting process adopted herein is quite similar to the current process. We recognize that requiring interconnected VoIP service providers to report even significant outages imposes a burden on them, but we have determined that the cost to these providers of implementing the rules adopted herein is justified by the overwhelming public benefit of a reliable 9-1-1 system and firmly grounded in the Commission's statutory obligation to ensure that reliability 9-1-1 service is provided to users of interconnected VoIP service. Finally, we decide to defer the question of outage reporting requirements for broadband Internet service providers and determine that this issue deserves further study.²⁸

II. BACKGROUND

10. The 9-1-1 system is part of the Nation's critical communications infrastructure. The Commission plays a key role ensuring that the communications network promotes public safety, including matters involving the national security and emergency preparedness of the United States.²⁹ Indeed, Congress established the Commission in part to promote the "safety of life and property."³⁰

11. To perform our statutory and administrative duties effectively, we need timely, accurate and longitudinal information about the nation's communications infrastructure. Since 1992, the Commission has required wireline providers to report major disruptions to their communications services.³¹ In 2004, the Commission extended reporting requirements to providers of wireless (including paging), cable, and satellite communications. With respect to wireless services, the Commission referred to communications that are provided using cellular architecture pursuant to Parts 22, 24 and 90 of the Rules, as well as CMRS paging services.³²

12. The current outage reporting process under Part 4 involves online submission of very basic information within two hours of discovering the existence of a reportable outage ("Notification"), additional information within 72 hours ("Initial Report"), and a more detailed description of the outage and cause(s) within thirty days ("Final Report").³³ The online submissions are made via the FCC's

²⁸ 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, *Notice of Proposed Rule Making*, 26 FCC Rcd 7166, 7181 ¶ 31 (2011)(hereinafter *NPRM*).

²⁹ See Exec. Order No. 12,472, *Assignment of National Security and Emergency Preparedness Telecommunications Functions*, 49 Fed. Reg. 13471 (1984), as amended by Exec. Order 13,286, *Amendment of Executive Orders, and Other Actions, in Connection With the Transfer of Certain Functions to the Secretary of Homeland Security*, 68 Fed. Reg. 10619 (2003), and Exec. Order 13,407, *Public Alert and Warning System*, 71 Fed. Reg. 36975 (2006).

³⁰ See, e.g., 47 U.S.C. § 151.

³¹ See generally *1992 Part 4 Report and Order*.

³² See *2004 Part 4 Report and Order*, 19 FCC Rcd at 16922 at App. B. In addition, in 2005, the Commission sought comment on whether network outage reporting requirements should be extended to include broadband Internet access service providers, but no action was taken on the proposal. *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, CC Docket No. 02-33, *Report and Order and Notice of Proposed Rulemaking*, 20 FCC Rcd 14853, 14933 ¶ 154 (2005) (*Wireline Broadband ISP Order and NPRM*), *aff'd. sub nom. Time Warner Telecom Inc. v. FCC*, 507 F.3d 205 (3d Cir. 2007).

³³ See 47 C.F.R. § 4.11. The Notification shall provide the name of the reporting entity; the date and time of onset of the outage; a brief description of the problem; service effects; the geographic area affected by the outage; and a contact name and contact telephone number by which the Commission's technical staff may contact the reporting entity. The Initial report shall contain all pertinent information then available on the outage. The Final report shall (continued....)

Network Outage Reporting System (NORS), a web-based filing system through which communications providers covered by the Part 4 reporting rules submit reports to the FCC. This system uses an electronic template to promote ease of reporting and encryption technology to ensure the security of the information filed.

13. The Commission uses outage information submitted pursuant to Part 4 of its rules to carry out our mission to promote “safety of life and property” and to fulfill our responsibilities under the Executive Orders describe above by identifying communication system vulnerabilities. Over the last six years, the Commission staff, working with communications providers, has been able to facilitate improved communications resiliency and emergency readiness. The Commission is uniquely positioned to do so. The outage reports identify issues that the Commission needs to address with individual providers whose reports reveal a need for improved reliability. But the Commission also monitors outage reports filed by all reporting providers to identify statistically meaningful trends. Because outage reports are presumed to be confidential,³⁴ no individual carrier, no matter how diligent or motivated, is positioned to perform that role. When Commission staff identifies a possible area of concern across providers, we gather providers together in coordinated efforts to improve security, reliability and resiliency. Where necessary, the Commission considers policy changes to address persistent problems. Over the years, this work has consistently resulted in reductions in the number of outages, as evidenced by a decrease in the number of outage reports filed. More important, the net decrease in the frequency of reported outages reflects an increase in the reliability of the communications infrastructure, which thereby leads to an increase in the availability of the public safety services that rely on the communications infrastructure. In short, as a result of reporting and our subsequent analysis, measureable reliability improvements have been achieved, and reporting has led to improvements in the engineering, provisioning, and deployment of communications infrastructure and services.³⁵

14. In addition, sharing aggregated outage information with providers nationwide has led to the development and refinement of industry best practices, which, in turn, has reduced the number of communications outages. Industry stakeholders and others have recognized the value of these data.³⁶ For example, wireline outages spiked in 2008, decreasing the reliability of 9-1-1 services. Through ongoing, systematic analysis of monthly wireline outages and subsequent work by the Commission and industry groups, such as the Network Reliability Steering Committee (NRSC)³⁷ and the National Emergency

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contain all pertinent information on the outage, including any information that was not contained in, or that has changed from that provided in, the Initial report.

³⁴ See 47 C.F.R. §4.2.

³⁵ See Network Reliability Steering Committee Annual Report 2004 (Oct. 2005), available at http://www.atis.org/NRSC/Docs/2004_Annual_Report.pdf (last visited Feb. 2, 2012).

³⁶ See Network Reliability Steering Committee 2008-2009 Biennial Report (Apr. 2010), available at <http://www.atis.org/nrsc/Docs/ATIS-0100029%20-%20NRSC%20Biennial%20Report.pdf> (last visited Feb. 2, 2012).

³⁷ The Alliance for Telecommunications Industry Solutions (ATIS) Network Reliability Steering Committee (NRSC) is the steering committee of the Network Reliability Council (NRC), which was formed in 1992 to bring together leaders of the telecommunications industry and telecommunications experts from academic and consumer organizations to explore and recommend measures that would enhance network reliability. A key method by which the NRSC accomplishes its work is through coordination with Commission staff on issues identified through analysis of NORS reports and other incidents. The NRSC currently includes nine major wireline and wireless carriers and the National Communications System. When network reliability issues are identified, often through the (continued....)

Number Association (NENA), the Commission and industry were able to understand the root causes of this trend, ultimately resulting in the application of improved industry practices that reduced the estimated number of lost 9-1-1 calls by 40 percent. Such dramatic reductions would not have been possible without this bigger picture of industry network reliability made possible by reporting and the sharing of outage data among Commission and industry experts.³⁸

15. Unlike legacy service providers, interconnected VoIP service providers are not covered by the Commission's current outage reporting rules.³⁹ As a result, the Commission is constrained in its ability to bring interconnected VoIP providers into this process of continual evaluation and improvement. The Communications Act and Commission rules do impose 9-1-1-related obligations on interconnected VoIP service providers. In 2005, the Commission adopted rules requiring providers of interconnected VoIP service to supply E9-1-1 capabilities to their customers as a standard feature from wherever the customer is using the service, including relaying Automatic Number Identification (ANI) and the caller's Registered Location to the PSAP, designated statewide default answering point, or appropriate local emergency authority.⁴⁰ And in 2008, Congress enacted the New and Emerging Technologies 9-1-1 Improvement Act of 2008 that, among other things, amended the 9-1-1 Act to codify the Commission's E9-1-1 rules for interconnected VoIP providers.⁴¹

16. Outages to interconnected VoIP service providers negatively affect the ability of interconnected VoIP service providers to meet basic and enhanced 9-1-1 service obligations because, whether or not facilities-based, interconnected VoIP service providers, their 9-1-1 calls are typically established⁴² using the standard Session Initiation Protocol (SIP),⁴³ which does not distinguish between 9-1-1 and other calls. The 9-1-1 call may transit a broadband Internet access service provider and a broadband backbone Internet service provider in order to reach the non-facilities-based interconnected VoIP service provider's 9-1-1 database for routing instructions to reach the caller's nearest PSAP. The inability of SIP to distinguish between 9-1-1 and non-emergency interconnected VoIP calls means that outage reporting for all aspects of interconnected VoIP connectivity is necessary to understand and ensure the reliability of 9-1-1 VoIP calls.

17. The outage information received from interconnected VoIP service providers will help the Commission determine the magnitude of their impact on the nationwide 9-1-1 system, whether action can be taken immediately to help providers recover and prevent future outages, and ensure, to the extent

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Commission's analysis of NORS reports, the NRSC will constitute a team to review the issue and recommend best practices and solutions. See <http://www.atis.org/nrsc/index.asp> (last visited Feb. 2, 2012).

³⁸ ATIS, NRSC Bulletin No. 2009-006 Wireline Outages (Oct. 2009).

³⁹ See 47 C.F.R. §§ 4.1-4.13. The Commission's current outage reporting requirements are limited to traditional voice and paging communications services over wireline, wireless, cable, and satellite and do not apply to outages affecting interconnected VoIP service providers. See *supra* note 23 and accompanying text.

⁴⁰ *IP-Enabled Services; E9-1-1 requirements for IP-Enabled Service Providers*, WC Docket No. 04-36, WC Docket No. 05-196, *First Report and Order and Notice of Proposed Rulemaking*, 20 FCC Rcd 10245, 10246 (2005) (*VoIP 9-1-1 Order and VoIP 9-1-1 NPRM*). See 47 C.F.R. § 9.5(b). The Registered Location is "[t]he most recent information obtained by an interconnected VoIP service provider that identifies the physical location of an end user." 47 C.F.R. § 9.3.

⁴¹ New and Emerging Technologies 9-1-1 Improvement Act of 2008, Pub. L. No. 110-283, 122 Stat. 2620 (2008) (NET 911 Improvement Act of 2008).

⁴² See <http://ir.vonage.com/releasedetail.cfm?ReleaseID=194444> (last visited Feb. 2, 2012).

⁴³ Session Initiation Protocol (SIP) is a signaling protocol for creating, modifying, and terminating VoIP sessions with one or more participants. See <http://www.ietf.org/rfc/rfc3261.txt> (last visited Feb. 2, 2012).

possible, that the various VoIP services are prepared for natural and man-made disasters. Such information will allow the Commission to use the same successful process it currently uses with providers of legacy services to refine and develop best practices that will help enhance the reliability of interconnected VoIP service in emergency situations. We expect that the reports will enable the Commission staff, in conjunction with industry, to analyze patterns of interconnected VoIP service outage on an industry-wide basis, in a manner that will lead to measurably improved reliability and outage reductions that have been achieved to date using data from NORS.⁴⁴ These benefits will become increasingly important as the use of interconnected VoIP service grows.⁴⁵

18. The *National Broadband Plan* recommended that the Commission extend the Part 4 outage reporting rules to include, *inter alia*, interconnected VoIP service providers,⁴⁶ and in July 2010, the Public Safety and Homeland Security Bureau (Bureau) sought comment in a *Public Notice* on extending the Part 4 rules to interconnected VoIP services.⁴⁷ On May 13, 2011, the Commission adopted a *Notice of Proposed Rulemaking* seeking comment on, *inter alia*, extending Part 4 to these services.⁴⁸ On September 8, 2011, the Bureau held a public workshop that addressed this subject.⁴⁹

⁴⁴ The Massachusetts Department of Telecommunications and Cable (MDTC) sees similar benefits, believing the FCC's extending outage reporting requirements will "benefit more than 1 million Massachusetts residential and business subscribers of interconnected VoIP services and more than 2.5 million Massachusetts Internet broadband households." Comments of MDTC at 2. The MDTC maintains that by extending outage reporting requirements to interconnected VoIP providers, the FCC may better enforce existing E-9-1-1 obligations and analyze root causes of outages, which will improve the overall communications network performance." *Id.* at 3. Uffe-Holst Jensen, Councillor, European Commission, explained that the European Union adopted a 2009 Directive, which includes an obligation for outage reporting (on telephone voice-fixed networks, data services, satellite communications, fixed networks, and wireless broadcast services) because "It is important to have some kind of minimum standards . . . [T]o ensure that what we [In the European Union] achieve the most competitive knowledge-based economy. . . . we need to be sure that the telecom services are reliable, and are available. So we need to have a set of minimum standards for the Member States. And it goes into the overall competitiveness of the European Union . . .". Directive 2009/140/EC of the European Parliament and of the Council, chapter IIIa, art. 13(a)(3) (Nov. 25, 2009)(Directive), available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:337:0037:01:EN:HTML> (last visited Feb. 2, 2012).

⁴⁵ This view is shared by observers not just in this country, but in other countries with advance communications networks as well. Masaru Fujino, Counselor, Embassy of Japan in USA, Ministry of Foreign Affairs of Japan, recently said the following about the need for outage information: "And [in Japan] we are more and more dependent on the IP networks, both for . . . public education and for the emergency calls. So it is quite essential in Japan for us, too, to get the information on the IP networks." Workshop/Webinar on Proposed Extension of Outage Reporting and on Network Reliability and Continuity, Washington, DC, September 8, 2011, at 57 (*FCC Workshop*).

⁴⁶ Omnibus Broadband Initiative, *Connecting America: The National Broadband Plan* (Recommendation 16.6, Mar. 2010) (*NBP*), available at <http://www.broadband.gov/plan/national-broadband-plan-action-agenda.pdf> (last visited Feb. 2, 2012).

⁴⁷ See generally *Public Safety and Homeland Security Bureau Seeks Comment on Whether the Commission's Rules Concerning Disruptions to Communications Should Apply to Broadband Internet Service Providers and Interconnected Voice Over Internet Protocol Service Providers*, ET Docket No. 04-35, *Public Notice*, 25 FCC Rcd 8490 (2010) (*PSHSB PN*).

⁴⁸ *NPRM*, 26 FCC Rcd at 7167.

⁴⁹ Workshop/Webinar on Proposed Extension of Outage Reporting and on Network Reliability and Continuity, Washington, DC, September 8, 2011 (*FCC Workshop*).

III. NEED FOR COLLECTING OUTAGE INFORMATION ON INTERCONNECTED VOIP SERVICE

A. Need for Requirement

19. As set forth below, we conclude that significant outages of interconnected VoIP service should be reported to the Commission.

1. Proposal

20. In the *NPRM*, we proposed, *inter alia*, to extend the Part 4 outage reporting requirements to include both facilities- and non-facilities-based interconnected VoIP services.⁵⁰ The Commission recognized that monitoring and analysis of outages is needed in light of increasing evidence that major VoIP service outages are occurring⁵¹ and given that such outages may disable 9-1-1 and other service capabilities. Further, because there currently are no Commission requirements to report such outages, the Commission recognized that it is unable to facilitate resolution, analyze underlying causes, and support the development and application of best practices, all of which, together, ultimately leads to a higher level of network reliability that can better support E9-1-1 service and emergency response.

2. Comments

21. Most industry commenters argue that the Commission does not need to collect interconnected VoIP service outage information because service providers have market incentives to ensure that their systems are reliable.⁵² Some industry commenters argue that the interconnected VoIP information is unnecessary because broadband network technologies⁵³ are designed to reroute traffic to avoid loss of service and/or connectivity, and thus an outage of a facility for interconnected VoIP service may have no effect on the ability to continue to send or receive the related traffic.⁵⁴ Some industry commenters argue that the burdens of extending the Part 4 requirements outweigh the benefits or are otherwise not justified.⁵⁵ State government⁵⁶ and commenters from critically important industry sectors,

⁵⁰ *NPRM*, 26 FCC Rcd at 7170 ¶¶ 11, 26, 40, 46.

⁵¹ See Om Malik, *VoIP Has Serious Problems*, GigaOM, March 6, 2005, available at <http://gigaom.com/2005/03/06/voip-has-serious-problems/> (last visited Feb. 7, 2012).

⁵² See, e.g., American Cable Association (ACA) Comments at 2; AT&T, Inc. (AT&T) Comments at 11-14; The Wireless Association (CTIA) Comments at 6; MegaPath Inc. (MegaPath) Comments at 3-4; MetroPCS Communications, Inc. (MetroPCS) Comments at 6-7; Sprint Nextel Corporation (Sprint) Comments at 5; T-Mobile USA, Inc. (T-Mobile) Comments at 1-3; United States Telecom Association (USTA) Comments at 2-3; the Voice on the Net Coalition (VON Coalition) Comments at 5-6; Vonage Holdings Corp. (Vonage) Comments at 5-6; XO Communications (XO) Comments at 3.

⁵³ VoIP service relies on broadband technologies.

⁵⁴ See MetroPCS Comments, at 9-10; National Cable & Telecommunications Association (NCTA) Comments at 5; Sprint Comments at 5; Verizon and Verizon Wireless (Verizon) Comments at 11; XO Comments at 3.

⁵⁵ AT&T Comments at 2; Time Warner Cable Inc. (Time Warner) Comments at 6; VON Coalition Comments at 10. We address the costs and benefits of the new rules below at paras. 45-53, *infra*.

⁵⁶ MDTC Comments at 2; Michigan Public Service Commission (Michigan PSC) Comments at 2-3; National Association of State Utility Consumer Advocates and the New Jersey Division of Rate Counsel (NASUCA) Comments at 8-11; New York Public Service Commission (NYPSC) Comments at 2, 5-7; Letter from J. Bradford Ramsey, General Counsel, National Association of Regulatory Utility Commissioners, to the Honorable Julius Genachowski, Chairman, Federal Communications Commission, *et al.*, dated Feb. 8, 2012 ("NARUC February 8, 2012 *Ex Parte* Filing).

such as finance and utilities,⁵⁷ however, support the Commission's tentative conclusion that this additional outage information is needed to protect the public.

3. Discussion

22. Based on the record in this proceeding, we continue to believe that outage reporting is the most effective and least burdensome way to ensure that interconnected VoIP providers are meeting their statutory obligation to provide 9-1-1 service and that, without such reporting, we will continue to have extremely limited visibility into the reliability of access to 9-1-1 emergency services, which impairs our ability to secure improvements in 9-1-1 service reliability and to fulfill our statutory obligations pursuant to the NET9-1-1 Act.

23. To address network reliability issues, the Commission has generally employed the light-touch approach of using outage reporting requirements to facilitate the development and use of voluntary best practices, rather than an approach that relies on such measures as mandating specified levels of performance. Since the institution of the Part 4 rules in 2004, we have reviewed and analyzed outage data on both an individual provider and an aggregated basis. We regularly collaborate with providers to identify the causes of outages, develop and apply best practices to address the causes of both isolated and systemic outages, and in some cases, even facilitate restoration efforts.

24. The Commission is uniquely positioned to piece together an overall picture of aggregated network performance because of the ability to collect and analyze outage data provided by communications providers that would otherwise be disinclined to share sensitive outage data. No single provider – even with strong commercial incentives to ensure that its network performance attracts and retains customers – has the data to spot trends across industry and lead efforts to coordinate effectively with other governmental entities and industry working groups. The Commission's ability to look at information received from different providers' outage reports allows us to assess large-scale outages when they occur, thereby increasing the opportunities for federal assistance in dealing with the immediate problem. The following discussion identifies a number of ways that outage reports have served as a uniquely effective precipitating force for improving network reliability – and thus the reliability of 9-1-1 services.

25. *Collaboration with Network Reliability Steering Committee.* On a quarterly basis, the Commission provides the NRSC with aggregated outage data across all entities subject to Part 4 of the rules and draws attention to those categories of outages showing a statistically significant trend upward in the number of outages. With respect to these categories of outages, the Commission then requests that the NRSC create a team to recommend procedures, best practices and, in some cases, equipment design alterations to address the underlying issue.

26. A complete wireline outage impairs the ability of consumers to reach 9-1-1. Hence, a dramatic reduction in wireline outages will result in a dramatic reduction in lost 9-1-1 calls. In 2008, the frequency of wireline outages was increasing at a rate of 3.5 percent per month. The Commission referred this situation to the NRSC, which analyzed the major causes of these outages and recommended best practices to reverse the trend. The NRSC team found that the substantial increase in wireline outages was due primarily to cable damage, identified a set of best practices that would prevent these types of outages, and released to the public a bulletin describing their findings.⁵⁸ As the chart below illustrates, during the six-month period when the Commission worked with the NRSC to reverse the trend in wireline

⁵⁷ Financial Services Sector Coordinating Council Reply Comments at 2; Utilities Telecom Council Reply Comments at 1-2.

⁵⁸ ATIS, NRSC Bulletin No. 2009-006 Wireline Outages (Oct. 2009).

outages, there was a more than 40-percent reduction in the estimated lost 9-1-1 calls due to wireline outages.

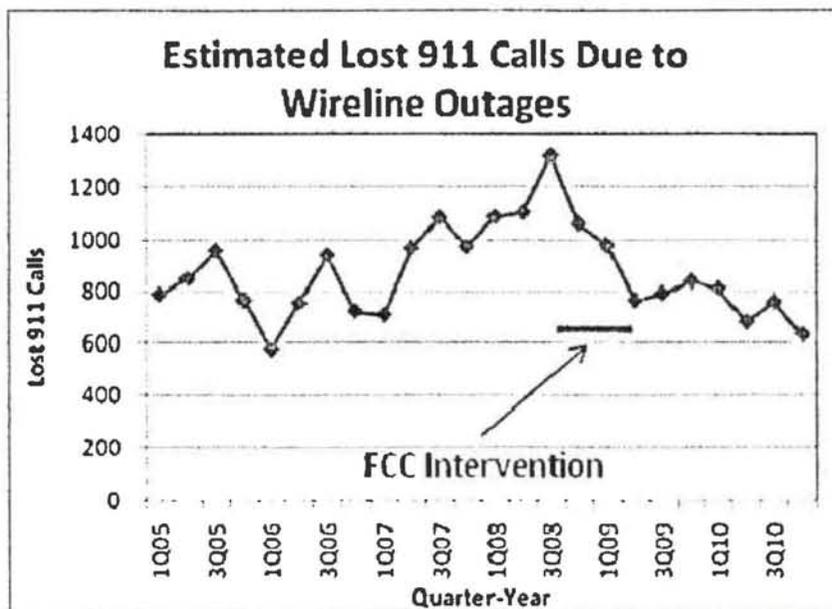


Figure 1: Estimated Reduction in Lost 9-1-1 Calls

27. Moreover, the Commission also has addressed several other types of outage problems that are not reflected in the Figure 1 data. In 2005 and 2006, analysis of NORS data revealed an extremely high incidence of outages affecting back-up-paths (*i.e.*, those paths that handle traffic when the primary paths fail) in high-capacity transport circuits.⁵⁹ The Commission requested that the NRSC develop and implement revisions to existing best practices to reduce the length of time that back-up-paths were inoperative. In the months following the Commission's referral of this problem to the NRSC, the number of these outages dropped by more than 65 percent,⁶⁰ increasing the resiliency of the communications infrastructure and the availability of public safety communication services.

28. In 2009, analysis of data filed in NORS revealed a high incidence of outages affecting the portion of the network dedicated to 9-1-1 (*i.e.*, dedicated routers and trunks responsible for routing 9-1-1 calls to emergency dispatch operators).⁶¹ Again, the Commission worked with the NRSC to identify best practices that would prevent these problems. A year later, these outages had decreased by 13 percent.

⁵⁹ Presentation by Jeffery Goldthorp, Chief, Communications Systems Analysis Division, Public Safety & Homeland Security Bureau, Federal Communications Commission, "Analysis of Network Outage Reports for NRSC Meeting", to the Network Reliability Steering Committee of the Alliance for Telecommunications Industry Solutions on October 19, 2006, Viewgraph 6 (filed in the instant proceeding on May 12, 2011).

⁶⁰ Presentation by John Healy, Telecommunications Systems Specialist, Communications Systems Analysis Division, Public Safety & Homeland Security Bureau, Federal Communications Commission, "Analysis of Network Outage Reports for NRSC Meeting", to the Network Reliability Steering Committee on July 24, 2007, Viewgraph 6 (filed in this proceeding on May 12, 2011).

⁶¹ See <http://editor5.securesites.net/911/> (last visited Feb. 2, 2012), for a description of how a 9-1-1 call traverses the dedicated 9-1-1 network. See also 47 C.F.R. § 9.3 Definitions, Wireline E911 Network, describing portions of the telephone network dedicated to serving 9-1-1 calls.

29. In 2011, following widespread wireless 9-1-1 failures in the Washington, D.C. area during a major snowstorm, the Commission referred an issue regarding Centralized Automatic Message Accounting trunk performance to the NRSC.⁶² After studying the problem, the NRSC recommended changes in equipment settings and emergency procedures that have been applied nationwide to resolve an issue that was causing trunks carrying traffic to PSAPs to go out of service.⁶³

30. *Coordination with Individual Providers.* Based on analyzing outage data, the Commission has been able to spot statistically significant upward trends in the number of outages filed by particular providers, trends that the provider had either not identified or not addressed adequately. In these cases, the Commission contacts the provider and works with it to identify causes and solutions. In several such cases, service providers have implemented large-scale improvements to their networks. The net result of reducing the number of reportable outages is increased resiliency of the communications infrastructure and availability of the public safety services that rely on the communications infrastructure. For example:

- In 2006, after NORS analysis revealed a major outage, the provider, at the Commission's urging, implemented an audit program across its entire footprint to monitor the diversity of all major facilities, including critical 9-1-1 and Signaling System 7 (SS7) facilities. The importance of this work was magnified because the source of these outages was a Digital Cross Connect System, a major hub for traffic in carrier networks.
- In 2008, after NORS analysis revealed a large increase in the number of wireless outages affecting access to 9-1-1, a major wireless provider instituted new monitoring capabilities on its links and aggressively worked with the companies from which it leased facilities to improve the reliability of the facilities. By 2009, the number of this type of outage had decreased by 60 percent.
- In 2006, after NORS analysis revealed a large outage affecting B and D links,⁶⁴ resulting in 3.5 million blocked calls, a major provider instituted new rules on the sizing of B or D links to ensure the links in the SS7 networks are not overloaded.
- In 2009, after NORS analysis revealed that software problems were the root cause of an unusually high number of outage reports over the course of several months, a major provider replaced dense wavelength division multiplexing amplifier cards to correct the situation.

31. *Identification of Industrywide Issues Through NORS Analysis.* In 2010, Commission staff discerned from outage reports that a significant number of outages associated with delivery of 9-1-1

⁶² Centralized Automatic Message Accounting (CAMA) trunks are dedicated for Enhanced 911 use, and when reported to the telephony system provider, get immediate repair. Another feature that CAMA trunks provide is End User Hold. If a 911 call is placed on an ISDN PRI circuit and gets disconnected, the call drops and that channel of the T1 becomes idle. With CAMA trunks, the End User Hold feature keeps that call activated with the PSAP operator, displaying the calling party number. See http://www.amcomsoftware.com/Solutions/Enhanced_911_Solutions/FAQ/ (last visited Feb. 2, 2012).

⁶³ See NRSC 9-1-1CAMA Trunk Throughput Optimization Analysis (Aug. 2011), at 14-15 available at http://www.atis.org/legal/Docs/NRSC/CAMATrunk_Transmittal_Final.pdf (last visited Feb. 10, 2012).

⁶⁴ A "B" (bridge) link connects an SS7 Signaling Transfer Point (STP) to another STP. Typically, a quad of "B" links interconnect peer (or primary) STPs (e.g., the STPs from one network to the STPs of another network). A "D" (diagonal) link connects a secondary (e.g., local or regional) STP pair to a primary (e.g., inter-network gateway) STP pair in a quad-link configuration. Secondary STPs within the same network are connected via a quad of "D" links. The distinction between a "B" link and a "D" link is rather arbitrary. For this reason, such links may be referred to as "B/D" links. See <http://pt.com/page/tutorials/ss7-tutorial> (last visited Feb. 2, 2012).

services were being caused by a relatively small number of factors, each of which could be addressed by applying a known best practice. For example, Network Operators and Service Providers should consider placing and maintaining 9-1-1 circuits over diverse interoffice transport facilities⁶⁵ and deploy Diverse Automatic Location Identification systems used in Public Safety.⁶⁶ The Public Safety and Homeland Security Bureau (PSHSB) issued a *Public Notice* urging communications providers to implement these practices widely in their networks.⁶⁷

32. *Leveraging Outage Data to Assist Emergency Response.* During emergency situations, the Commission assists emergency response by providing “Notification”⁶⁸ data in NORS directly to the U.S. Department of Homeland Security, where it is used to support restoration efforts and emergency response. The Commission also uses it to provide real-time support to PSAPs that have been affected by a 9-1-1 outage.

33. For example, during Hurricane Katrina, the Commission received over 65 reports of outages from 21 providers. NORS data was the Federal government’s primary and best source of information about the condition of critical communications infrastructure in the disaster area. Using this information, the Commission was able to obtain FEMA’s assistance in maintaining operations in a vital communications hub in New Orleans, the Poydras St. Central Office. Specifically, outage data identified the importance of this particular switch to maintaining communications to a major part of the affected area, and it also revealed that the central office was down due to lack of power. In order to restore the functioning of the switch, personnel needed to access the area to provide fuel for the generators. Once the switch was functioning normally, it required security protection to ensure continued operations and stable access to fuel and back-up power. Based on information that the Commission provided to FEMA, U.S. Marshals were sent to secure the site.⁶⁹

34. In the years since Hurricane Katrina, the Commission, working with industry stakeholders, has developed and implemented a voluntary reporting system – Disaster Information Reporting System (DIRS) -- for use in large-scale emergencies. The decision to activate DIRS is based in large part on data that is made available to the Commission through NORS, which remains the Commission’s most expedient way to become aware of the effect on communications of major man-made and natural disasters. DIRS covers a broader range of communications than those services reported through NORS under Part 4 and is also used to track restoration efforts. Typically, we suspend NORS reporting in favor of the more comprehensive and more flexible DIRS system in the disaster area for the

⁶⁵ See Best Practice 8-7-0566, available at <https://www.fcc.gov/nors/outage/bestpractice/DetailedBestPractice.cfm?number=8-7-0566> (last visited Feb. 2, 2012).

⁶⁶ See Best Practice 8-8-075, available at <https://www.fcc.gov/nors/outage/bestpractice/DetailedBestPractice.cfm?number=8-8-0575> (last visited Feb. 2, 2012).

⁶⁷ 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, *Public Notice*, DA 10-494, rel. March 24, 2010, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-10-494A1.pdf (last visited Feb. 10, 2012).

⁶⁸ As indicated in the 2004 Part 4 Order and FNPRM, the Commission provides encrypted NORS data to the U.S. Department of Homeland Security. See 2004 Part 4 Order and FNPRM, 19 FCC Rcd at 16856 ¶ 47.

⁶⁹ Kneuer, J. U.S. Department of Commerce, The National Telecommunications and Information Administration (2006) (NTIA). NTIA Comments to the *Recommendations of the Independent Panel Reviewing the impact of Hurricane Katrina on Communications Networks*, EB Docket No. 06-119, *Notice of Proposed Rulemaking*, 71 Fed. Reg. 38564-01 (2006).

duration of the crisis. For example, in the wake of the unprecedented tornadoes in Missouri and Southern states and flooding of the Mississippi River in 2011, NORS data was the Commission's first view of the extent of the damage to communications facilities in those areas. In each case, NORS data was a critical factor in the decision making process of the Federal agencies involved to escalate the reporting requested of industry in connection with the disaster. DIRS was activated in both of these cases, and the information received assisted emergency response and resource allocation decisions in those disaster areas.

35. We believe that these examples show that our intervention, guided by outage reporting data, has resulted in tangible improvements to the communications reliability necessary to support 9-1-1 service. As reflected above, no single provider – even with strong commercial incentives to ensure that its network performance attracts and retains customers – has the data to spot trends across industry and lead efforts to coordinate effectively with other governmental entities and industry working groups. Indeed, we have seen that individual providers do not always take steps within their own operations to address reliability problems unique to themselves.⁷⁰ We thus disagree with commenters who argue that market incentives eliminate the need for network outage reporting to the Commission. In addition, we are not persuaded by the claims of a few commenters that outage reporting is unnecessary because broadband technologies reliably reroute traffic or that market incentives are sufficient to prevent significant outages.⁷¹ We find that these claims are belied by the rise in the incidence of significant VoIP outages.⁷² Further, the extent to which network rerouting is successful in preventing outages cannot be determined in the absence of outage data. Observers in critical infrastructure industries and in government, domestically and abroad, are becoming increasingly aware of the need to track reliability data obtained from services relying on broadband technologies to help ensure the reliability of emergency services and critical communications.⁷³

36. Further, reporting outage data is the most efficient means for the Commission to ensure that interconnected VoIP service providers are complying with their statutory obligation to provide 9-1-1 service, and to obtain critical information needed to monitor the reliability and availability of VoIP

⁷⁰ See *infra* note 82 and accompanying text.

⁷¹ See, e.g., Sprint Comments at 5, 7, 9 (Internet protocol networks will re-route traffic when a network node fails); CTIA Comments at 3-4 (next generation wireless standards rely on packet-switching, which divides the voice transmission into packets and sends them over the fastest available route). See also Vonage Reply Comments at 2-3 (VoIP communications are chopped into “packets” that are then routed over the fastest available route, meaning disruption along one network path will not necessarily interrupt communications); Wireless Communications Association, International, Inc Reply Comments at 1-3 (Internet guards against link failures by routing packets through any available path, in contrast to plain old telephone services, which rely on dedicated transmission paths that often have a single point of failure).

⁷² See *supra* para. 6.

⁷³ The basic problem of understanding the extent of the problem without the tools to fully understand it has been observed by others. At the *FCC Workshop*, Laurie Flaherty observed: “Without gathering information from each and all [of the interconnected VoIP service providers and broadband ISPs], it is difficult to figure out . . . how much of a problem you are actually dealing with . . . it is really difficult to figure out how to manage what you can't measure. So from the FCC's perspective, in terms of the statutory requirement to ensure 911 services, I don't know how you would do that without being able to figure out that large a picture [obtained through outage reporting].” Laurie Flaherty, Coordinator, National 911 Program, National Highway Traffic Safety Administration, *FCC Workshop*, Transcript at 60.

Masaru Fujino, Counselor, Embassy of Japan in USA, Ministry of Foreign Affairs of Japan, recently observed that the number of outage events in IP-based services are increasing, jumping from just seven severe incidents in Fiscal Year 2003 to eighteen severe incidents in Fiscal Year 2009. The Japanese government found that many outage incidents involving IP based networks were due to software malfunctions. *FCC Workshop*, Transcript at 45, 48.

9-1-1/E9-1-1 services. As indicated above, both the Act and the Commission's rules mandate that interconnected VoIP service providers provide 9-1-1 and E9-1-1 service, and the rules we adopt today will provide the Commission with a mechanism in place to monitor whether these providers are complying with this basic obligation. Requiring interconnected VoIP service providers to promptly file reports when they experience outages that meet certain thresholds appears vastly superior, for example, to a complaint-driven process; the latter would likely be ineffective in enabling the Commission to detect and resolve quickly (with assistance from the providers involved) failures in the provision of 9-1-1 and E9-1-1 service.⁷⁴

B. Mandatory or Voluntary Requirement

37. As discussed below, we conclude that reporting significant outages of interconnected VoIP service should be mandatory.

1. Proposal

38. In the *NPRM*, the Commission proposed mandatory reporting of significant outages for interconnected VoIP service providers. Mandatory reporting would permit the Commission to obtain a comprehensive, nationwide view of significant outages and assess and address their impact on 9-1-1 and other services, whereas voluntary reporting would likely create substantial gaps in data that would thwart efforts to monitor compliance with statutory obligations and to analyze and facilitate improvement of the Nation's 9-1-1 system.⁷⁵ Therefore, we tentatively concluded that long-term voluntary reporting would serve neither the Nation nor the public well, particularly in light of our negative experience with voluntary reporting from providers of legacy services before the adoption of Part 4.⁷⁶

2. Comments

39. Some commenters suggest that, if the Commission extends its outage reporting rules, then reporting should be entirely voluntary,⁷⁷ with some arguing that existing voluntary efforts by providers and their ongoing involvement in public-private coordination efforts to share information and promulgate best practices are sufficient to minimize risks to the communications infrastructure.⁷⁸ Several industry parties argue that any reporting process should be voluntary and modeled after the voluntary DIRS.⁷⁹ Several providers argue that, if the Commission moves forward, there should be an interim period of up to two years before outage reporting becomes mandatory.⁸⁰

⁷⁴ In other contexts, the Commission has opted to require reporting in lieu of more proscriptive requirements. For example, Section 1.2110(n) of the Commission's Rules requires wireless providers that claim Designated Entity (DE) status to file an annual report to affirm the provider's continuing status as a DE. See 47 C.F.R. § 1.2110(n); FCC Form 611-T. Section 73.3615(a) of the Commission's Rules requires licensees of commercial AM, FM, and full power television broadcast stations as well as Licensees of Class A and Low Power Television stations to file an ownership report every two years to ensure compliance with statutory ownership limits. See 47 C.F.R. § 73.3615(a); FCC Form 323.

⁷⁵ *NPRM*, 26 FCC Rcd at 7189 ¶ 56.

⁷⁶ *NPRM*, 26 FCC Rcd at 7189-90 ¶ 57.

⁷⁷ See, e.g., ATIS Comments at ii, 16; AT&T Comments at 17-18; see also CenturyLink Comments at 20; Sprint Comments at 3; T-Mobile Comments at 10; Telecommunications Industry Association (TIA) Comments at 5; Verizon Comments at 6, 8.

⁷⁸ See CenturyLink Comments at 20; CTIA Comments at 2, 7; National Cable & Telecommunications Association (NCTA) Comments at 3, 12, 16.

⁷⁹ See T-Mobile Comments at 2, 10; USTA comments at 4, n.10; see also Verizon Comments at 8-10.**

⁸⁰ ATIS Comments at ii; CenturyLink Comments at 21.

3. Discussion

40. *Shortcomings of voluntary reporting.* Our experience in other contexts has been that competitive friction frequently makes service providers reluctant to voluntarily disclose detailed information about their own service outages. A voluntary outage reporting trial was attempted, without success, prior to the adoption of the Part 4 rules.⁸¹ There was “a history of several years of unsuccessful voluntary outage reporting trials conducted by groups working under the auspices of Network Reliability and Interoperability Council (NRIC). Those trials, which were conducted over a four-year interval . . . encouraged . . . providers to participate actively and fully in those network outage-reporting effort,” but “participation was spotty and . . . the quality of information obtained was very poor.”⁸² Based on this experience, the existing Part 4 reporting system was adopted as a mandatory reporting scheme to ensure timely, complete and accurate reporting.

41. We have no reason to believe that interconnected VoIP service providers are different, and the record in this proceeding provides us with no reason to believe that long-term voluntary reporting would fare any better this time around. This reluctance would inhibit the development of a highly reliable, nationwide 9-1-1 service, because it inhibits the kinds of information sharing and analysis described above, which the Commission is uniquely positioned to undertake.⁸³ Hence, we agree with the Massachusetts DTC view of “voluntary practices as not removing the critical public safety need for outage data or reporting.”⁸⁴ Moreover, even if VoIP providers were not reluctant to share this information, an individual provider would have insufficient incentive to share such data, because some of the benefits would accrue to other providers. As we explained earlier,⁸⁵ the outage information shared by one provider has led to the development of industry best practices that have benefited all providers nationwide. We also share NASUCA’s view that “[s]ervice outage reporting is far too important to be left to the industry’s voluntary participation,” and given the significant increase in VoIP usage, the risks of a less vigilant approach in this context are becoming indefensible.⁸⁶

42. We are also not persuaded by the argument that any new outage reporting process should apply the voluntary DIRS model.⁸⁷ There are significant differences between the purposes of DIRS and those of an outage reporting system. DIRS is a reporting system for use during large-scale disasters.⁸⁸ In

⁸¹ *2004 Part 4 Report and Order*, 19 FCC Rcd at 16840. Discussing its own experience with voluntary reporting of communications outages, NYPSC states that “despite commitments to participate, the level of real-time and consistent reporting by non-PSTN carriers has been a disappointment.” NYPSC Comments at 6.

⁸² *2004 Part 4 Report and Order*, 19 FCC Rcd at 16851-52. John Carlson, representing the Financial Services Sector Coordinating Council, made a similar observation on the question of why the extension of Part 4 of the Commission’s rules should not permit outage reporting on a voluntary basis: “[W]e did try that once . . . back before we did the original rules in Part IV today. We did that back in 2003 and 2004 as part of -- . . . the Network Reliability and Interoperability Council -- And it didn’t work out so well. There were a lot of gaps in reporting, and so we concluded that just wasn’t viable.” *FCC Workshop*, Transcript at 67-68. NASUCA echoed the FCC conclusion that past voluntary reporting efforts have been unsuccessful and have been “met with significant resistance.” NASUCA Comments at 10.

⁸³ See *supra* para. 24.

⁸⁴ MDTC Comments at 3.

⁸⁵ See *supra* paras. 14, 17.

⁸⁶ NASUCA Comments at ii-iii.

⁸⁷ See, e.g., Verizon Comments at 8; T-Mobile Comments at 2, 10; ATIS Comments at 17-18.

⁸⁸ As discussed above, DIRS covers a broader range of communications than those services reported through NORS under Part 4 and is also used to track restoration efforts. Typically, we suspend NORS reporting in favor of the more comprehensive and more flexible DIRS system in the disaster area for the duration of the crisis.

disasters, it is important to have maximum flexibility in the types of information requested and the timing of reports so as to enhance situational awareness of the details of the emergency response. DIRS is rarely activated, and the urgent events that lead to its activation tend to motivate communications providers to cooperate to provide the information that is needed to support emergency response. Outage reporting, on the other hand, is designed to enable the Commission to identify key network failures quickly to facilitate restoration and, over time, to create a consistent body of data to permit statistical analysis of trends and patterns over time. Moreover, apart from the outage reports themselves, the Commission may otherwise be unaware of the underlying cause of the outage, such as an internal network failure, whereas outages reported under DIRS are generally widely known and created by an external event, such as a hurricane.

43. To the contrary, evidence suggests that the Commission's poor experience with voluntary outage reporting is not unique. The New York PSC, for example, comments that – based on its experience – voluntary reporting does not ensure that providers “will provide timely, accurate outage information.”⁸⁹ Likewise, the Japanese government finds it necessary to require mandatory outage reporting from broadband communications providers, including high-quality VoIP service.⁹⁰ Japan's adoption of the requirement was a response to the rapid increase of IP-based communications in Japan in recent years, including VoIP. Japan continues to see increasing dependency on VoIP as the primary means to make emergency calls. In 2008, Japan modified its outage reporting requirements to reflect this trend. Today in Japan, 18 million out of 26 million VoIP subscribers use high-quality VoIP, which is required to have an emergency call function, or something equivalent to the U.S. 9-1-1 emergency calling system.⁹¹

44. As we observed, the Commission attempted a voluntary outage reporting trial without success before adoption of the Part 4 rules. The record in this proceeding provides us no reason to believe that long-term, voluntary reporting would fare any better this time around. Although several commenters argue for a trial voluntary reporting period of 12 to 24 months, we believe a mandatory reporting requirement best meets the needs of the Commission to ensure the statutory mandate that interconnected VoIP service providers deliver reliable 9-1-1 service.

45. Similarly, in 2009, the European Union adopted a Directive obligating Member States to ensure that providers of broadband communications notify their respective national regulatory authorities of any breach of security or loss of integrity that has a significant impact on the operation of networks or services. Member States must ensure that the providers take all appropriate steps to ensure the continuity of services and to notify their national regulatory authority of any loss of integrity having a significant impact on network operations or services.⁹² Prior to adoption of the 2009 Directive, only Finland and

⁸⁹ NYPSC Comments at 6.

⁹⁰ According to Japan's Telecommunications Carriers Law Section 2, application providers have an obligation to report when there has been service disrupted by outages impacting 30,000 people or more for two hours or more. See http://www.soumu.go.jp/menu_seisaku/ictseisaku/net_anzen/jiko/judai.html (last visited Feb. 3, 2012).

⁹¹ Masaru Fujino, Counselor, Embassy of Japan in USA, Ministry of Foreign Affairs of Japan, *FCC Workshop*, Transcript at 41, 44-45.

⁹² The European Union's Directive states: “Member States shall ensure that undertakings providing public communications networks take all appropriate steps to guarantee the integrity of their networks, and thus ensure the continuity of supply of services provided over those networks.” Council Directive 2009/140, art. 13a(2), 2009 O.J. (L 337) 37 (EC)(*Directive*), available at <http://eur-ex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:337:0037:01:EN:HTML> (last visited Feb. 3, 2012). “Member States shall ensure that undertaking providing public communications networks or publicly available electronic communications services notify the competent national regulatory authority of a breach of security or loss of integrity that has had a significant impact on the operation of networks or services.” *Id.* at art. 13a(3).

Sweden had experience with this kind of reporting mechanism.⁹³ While Member States individually may amend national legislation, they are obligated to fulfill the objective of the 2009 EU Directive.⁹⁴

46. In short, given the long-term upward trend in VoIP subscription and use, the growing dependence on VoIP for 9-1-1 communications, our prior experience with voluntary reporting, and the statutory mandate that VoIP providers provide 9-1-1, we adopt mandatory outage reporting of interconnected VoIP service, as detailed below. Further, to the extent that interconnected VoIP service providers have affiliated and/or non-affiliated entities that maintain or provide communications networks or services used by the provider in offering such communications, these obligations apply equally to these entities.

47. The rules adopted today modify significantly the proposal in the *NPRM*, in part in response to providers' concerns regarding the costs and burdens associated with reporting significant outages. Specifically, in the *NPRM*, we proposed to extend Part 4 to broadband Internet service providers as well as interconnected VoIP providers. In addition, we proposed to require reporting as outages both loss of service/connectivity as well as situations where, though service is technically being provided, packet loss, latency or jitter were experienced at a level that effectively prevented communication.⁹⁵

48. We are not acting at this time on the extension of Part 4 rules to broadband Internet service providers or to outages based on performance degradation, both of which were sharply opposed by industry on several bases, but especially based on the expected costs to implement these proposals. The rules we adopt today to extend outage reporting to interconnected VoIP services received broad support in the record, and no commenter has argued that this scaled-back, modified extension of outage reporting would be unduly burdensome. We believe that the reporting obligation we impose today will allow us to fulfill our own obligations and to adequately monitor providers' compliance with the obligations. To the extent our predictive judgment proves incorrect, the Commission may revisit this conclusion in the future.

49. *Expected data collection costs.* The record in this proceeding reflects that the additional costs of compliance with our data collection requirement would be minor and significantly outweighed by the benefits. We require the reporting only of significant outages where customers lose service and/or connectivity and, therefore, the ability to access 9-1-1 services. Since every interconnected VoIP service provider has a competitive interest in providing reasonable network reliability to satisfy their customers, it is reasonable to conclude that every such provider is already tracking this sort of information in some manner.⁹⁶ We agree with the comments of the NASUCA and the New Jersey Division of Rate Counsel, which observe, "because VoIP service providers . . . should already be collecting outage-related data in the normal course of conducting their businesses and operations," submitting reports to the Commission "would not result in an undue administrative burden."⁹⁷

50. The record confirms that the configuration of VoIP service should already make this information available. End-user VoIP terminals are IP-enabled devices that run Simple Network Management Protocol (SNMP) with the associated Management Information Base (MIB) or can be monitored by various keep alive mechanisms. Thus, the Network Management System (NMS) of

⁹³ Uffe-Holst Jensen, Councillor, European Commission, *FCC Workshop*, Transcript at 15-16.

⁹⁴ *Id.* at 18.

⁹⁵ With respect to the costs associated with the original proposal to adopt thresholds for quality of service, Verizon claimed it would have to spend in excess of \$100,000,000 (*i.e.*, \$75,000 to upgrade every router). Verizon Comments at 22.

⁹⁶ *See, e.g.*, Verizon Comments at 3.

⁹⁷ NASUCA Comments at 11.

interconnected VoIP providers is able to auto-poll or execute a manual poll of a portion or all of its VoIP-enabled devices to see if they have connectivity. Thus, interconnected VoIP service providers have the ability to monitor their end-user devices to determine if connectivity to those devices has been lost.⁹⁸ The inability of a VoIP-enabled device to connect with its call management system (SIP proxy, Call Manager, etc.) prevents the end-user VoIP-enabled device from making a call, whether or not the end-user device has IP connectivity. This call management system is similar to SS7, where a similar failure would also prevent voice service. These types of failures, if large enough, would most certainly generate a “trouble ticket” or, for smaller incidents, register on similar systems that track outages and customer technical issues. Therefore, it is reasonable to conclude that interconnected VoIP service providers currently have the ability to monitor VoIP-enabled end-user devices for connectivity.⁹⁹ No more is required to satisfy the data collection obligation established here.

51. Indeed, the record reflects that the costs involved in determining whether customers are completely out of service do not impose an undue burden. AT&T suggests that if the Commission extends outage reporting to interconnected VoIP service providers, it should adopt a simple reporting threshold, such as lack of service and/or connectivity.¹⁰⁰ Similarly, Vonage maintains that if the Commission adopts interconnected VoIP service outage reporting, it should require only reporting of “actual loss of communications due to a failure on the provider’s own network. . . [because it] . . . would avoid the heavy burden . . . while also conserving scarce resources.”¹⁰¹

52. Not only do the National Cable & Telecommunications Association, the American Cable Association, and the National Telecommunications Cooperative Association agree that the approach taken today is substantially less burdensome than the one proposed in the *NPRM*,¹⁰² but a wide array of

⁹⁸ At the *FCC Workshop*, Mark Adams commented: “So, at a basic level, we obviously do device level monitoring, and based on the types of devices, we know generally -- not always, but generally -- is it completely service affecting, or is it going to result in some kind of degradation. So we do device level monitoring. We monitor our end points for on or off status right through the switches, and through our cable modems.” Mark Adams, Executive Director, Technology Operations, Cox Communications, *FCC Workshop*, Transcript at 106.

⁹⁹ See, e.g., <http://www.juniper.net/us/en/local/pdf/app-notes/3500145-en.pdf> (last visited Feb. 3, 2012). These materials from Juniper Networks on “Real-Time Performance Monitoring on Juniper Network Devices” describe features available in this major vendor’s routing and switching platforms utilized by interconnected VoIP service providers that allow the service providers to determine if connectivity exists to the end-user VoIP-enabled devices.

¹⁰⁰ AT&T proposes the following requirement: “All interconnected VoIP providers shall submit electronically a Final Report within 30 days of discovering that they have experienced on any facilities that they own, operate, lease, or otherwise utilize, an outage of at least 120 minutes duration: (1) of a non-redundant VoIP network element; (2) that potentially isolates subscribers’ service for at least 900,000 user minutes; or (3) potentially affects a 911 special facility (as defined in paragraph (e) of Section 4.5).” AT&T Reply Comments at 8-9; see also ATIS Comments at 13; Century Link Comments at 13.

¹⁰¹ Vonage Comments at 8.

¹⁰² See *Ex Parte* Notice Letter, dated Dec. 16, 2011, from Steven F. Morris, Vice President, NCTA, to Marlene H. Dortch, Secretary, Federal Communications Commission (FCC), at 1 (giving tacit support for extending Part 4 requirements to interconnected VoIP services only, because such an approach would provide the Commission with valuable outage data, but would be far less burdensome and less expensive than the proposal in the *NPRM*) (filed Dec. 16, 2011); and see also *Ex Parte* Notice Letter, dated Dec. 9, 2011, from Barbara Esbin, Counsel, ACA, to Marlene H. Dortch, Secretary, FCC, at 3 (noting that limiting Part 4 requirements to interconnected VoIP providers undergoing “hard-down” service outages, providing additional time to make the required outage notifications to the Commission, and eliminating the need to file a detailed Initial Report would be a more reasonable and less burdensome approach to achieving the Commission’s stated goals than the requirements proposed in the *NPRM*) (filed Dec. 12, 2011); and see also *Ex Parte* Notice Letter, dated Dec. 19, 2011, from Jill Canfield, Director, Legal & Industry, National Telecommunications Cooperative Association, to Marlene H. Dortch, Secretary, FCC, at 1-2 (indicating that limiting the rules to “hard downs” affecting interconnected VoIP providers would be substantially (continued....))

commenters, including AT&T, Comcast, the Edison Electric Institute, and CTIA – The Wireless Association – submit that the type of outage reporting requirement we are adopting today is either reasonable, not unduly burdensome, or could be applied so as not to be unduly burdensome.¹⁰³ Even small providers do not assess our outage reporting requirement to be a burden. OPASTCO states that “small ILECs have functioned under Part 4 rules for a number of years without significant impacts on their operations” and, therefore, that extending Part 4 requirements to interconnected VoIP providers “should not prove to be unduly burdensome.”¹⁰⁴ US Telecom urges that if the Commission adopts outage requirements, that such requirements should be limited to a complete loss of interconnected VoIP service, and that such limits could contribute to a “more reasonable and less costly approach in achieving the Commission’s stated goals”¹⁰⁵ We do just that.

53. As interconnected VoIP service providers are driven by business reasons to monitor for service outages, it follows that tracking such information under our rules should not be unduly burdensome. It is significant that not one commenter has stated that it would have to install any additional equipment into its network to detect when a large number of VoIP customers are out of service. We find that mandatory reporting of significant outages is minimally intrusive and fully justified by the benefits of ensuring compliance with statutory 9-1-1 statutory obligations and benefits to public safety through robust 9-1-1 communications that we expect to result from our analysis and use of the reports.

54. *Expected data reporting costs.* Because service providers already have technical and competitive business reasons to routinely collect outage information, the costs of compliance with a reporting requirement are essentially those of identifying reportable outages, then electronically

(Continued from previous page) _____
less burdensome and appears reasonable and appropriate) (filed Dec. 19, 2011).

¹⁰³ See also *Ex Parte* Notice Letter, dated Nov. 23, 2011, from Joseph Marx, AT&T, et al., to Marlene H. Dortch, Secretary, FCC, at 2 (suggesting that the rules could be applied without undue burden to interconnected VoIP providers, provided such outage reporting apply only to events affecting a 9-1-1 facility or involving a complete loss of service that has an actual impact on customers’ ability to reach emergency services) (filed Nov. 23, 2011); see also *Ex Parte* Notice Letter, dated Nov. 18, 2011, from Mary McManus, Comcast Corporation (Comcast), to Marlene H. Dortch, Secretary, FCC, at 1 (indicating that Comcast generally supports [and would not find unduly burdensome] extending existing Part 4 network outage reporting obligations to interconnected VoIP providers in light of the consumer transition from traditional telephone services to VoIP services) (filed Nov. 18, 2011); see also *Ex Parte* Notice Letter, dated Nov. 4, 2011, from David K. Owen, Executive Vice President, Edison Electric Institute, to Marlene H. Dortch, Secretary, FCC, at 3 (indicating that rules that account for the unique architectural characteristics of VoIP technologies will promote reliable data reporting upon which electric utilities and other CII can rely, without imposing an onerous burden on commercial service providers) (filed Nov. 4, 2011); and see also *Ex Parte* Notice Letter, dated Dec. 20, 2011, from Brian M. Josef, CTIA, to Marlene H. Dortch, Secretary, FCC, at 1-2 (indicating that applying the rules to only interconnected VoIP providers that have endured a “hard down” outage appears relatively less burdensome when compared to the rules proposed in the *NPRM*) (filed Dec. 21, 2011).

¹⁰⁴ *Ex Parte* Notice Letter, dated Dec. 7, 2011, from Stephen Pastorkovich, Business Development Director/Senior Policy Analyst, Organization for the Promotion and Advancement of Small Telecommunications Companies (OPASTCO), to Marlene H. Dortch, Secretary, FCC (filed Dec. 7, 2011).

¹⁰⁵ *Ex Parte* Notice Letter, dated Dec. 7, 2011, from Glenn T. Reynolds, USTA, to Marlene H. Dortch, Secretary, FCC (filed Dec. 13, 2011). But see *Ex Parte* Notice Letter, dated Nov. 18, 2011, from Nneka Ezenwa, Executive Director, Verizon, to Marlene H. Dortch, Secretary, FCC, at 1 (opposing extension of the outage reporting requirements to interconnected VoIP providers as redundant, costly, and burdensome) (filed Nov. 22, 2011); see also *Ex Parte* Notice Letter, dated Nov. 21, 2011 from Brian J. Raymond, Director, Technology Policy, National Association of Manufacturers, to Chairman Genachowski and Commissioners Copps, McDowell, and Clyburn, at 1 (opposing extension of Part 4 to interconnected VoIP providers as a additional regulatory burden) (filed Nov. 22, 2011).

reformatting and uploading that information into NORS.¹⁰⁶ Many of the interconnected VoIP customers are served by providers that already have years of experience filing outage reports in NORS with respect to other services.¹⁰⁷ For those interconnected VoIP service providers for which NORS will be new, there will be an additional learning curve. Few parties resist reporting the complete loss of interconnected VoIP service and/or connectivity based on the costs involved in reporting the data.¹⁰⁸ Starting with information in the record from parties with experience filing in NORS and extrapolating that to the total cost that industry will bear to start reporting significant interconnected VoIP outages in NORS, we estimate that *industry-wide* the total operating cost for reporting on interconnected VoIP outages and administering outage reporting programs likely is less than \$1 million in the first year¹⁰⁹ and less than \$500,000 per year thereafter for *all* the providers who will report.¹¹⁰

55. *Comparison of benefits and costs.* In arriving at our decision today, we considered feasible alternatives. We evaluated the cost effectiveness of our adopted approach against a less stringent option (*i.e.*, collecting no additional outage information) as well as several more stringent options (*i.e.*, collecting several types of performance degradation data in addition to collecting data on complete outages). We also considered other mechanisms, such as certification (by which, for example, we monitor compliance with statutory obligations regarding Customer Proprietary Network Information),¹¹¹ complaint-driven mechanisms, and the imposition of performance standards.

¹⁰⁶ For business reasons, providers would naturally want to know if customers are experiencing any major problem with service continuity. There are no commenters who have said that they do not already have the capability of determining whether their customers have experienced significant, complete, “hard-down” outages.

¹⁰⁷ For example, Verizon FiOS and AT&T U-verse interconnected VoIP customers are served by Verizon and AT&T respectively, both companies having years of experience filing outage reports in NORS.

¹⁰⁸ See *supra* note 103 and accompanying text.

¹⁰⁹ Commission staff estimate first-year costs to include one-time training costs of \$416,000 to train approximately 300 new reporting entities (*i.e.*, 5 employees * 100 large service providers * 4 hours * \$80/hour = \$160,000 and 2 employees * 200 small service providers * 8 hours * \$80/hrs = \$256,000 for a total of \$416,000 in first-year training costs) in addition to the annual cost to report outages and administer the outage reporting program. According to data received on Form 477, there are 466 companies providing interconnected VoIP service. Of those companies, staff estimates that at least one-third are already under obligation to report outages of legacy services under the existing Part 4 rules, and that therefore, approximately 300 providers of interconnected VoIP service will now be obligated to report outages that meet the thresholds of the new rule. Based on years of experience coordinating with reporting entities, Commission staff estimates that the largest companies train an average of five staff on outage reporting, and that smaller companies train up to two. In terms of the amount of training necessary, staff estimates that four hours of training will be required for staff in those companies that are already reporting outages of legacy services, and twice that amount will be required for companies that are new to outage reporting. Labor costs were assumed to be \$80 per hour. As discussed in note 110, *infra*, the anticipated reporting costs are \$450,000. Therefore, the anticipated first-year costs are \$416,000 plus \$450,000, or approximately \$866,000.

¹¹⁰ Commission staff estimates the annual outage reporting costs to be \$450,000 (*i.e.*, \$300 per report * 1,500 additional reports). Underlying this calculation is the comment of ATIS that one carrier has indicated its average labor costs associated solely with the preparation of outage reports is approximately \$300 per report. See ATIS Comments at 7, n.9. With respect to the number of expected additional reports, staff extrapolated from several years of outage reporting data regarding wireline service outages (which are functionally equivalent to outages of interconnected VoIP services) and estimates that up to 1,500 additional outage reports per year might be filed for the entire interconnected VoIP industry. Thus, 1,500 reports * \$300/report equals \$450,000 annual cost for outage reporting.

¹¹¹ See 47 C.F.R. § 64.2009(e); Implementation of the Telecommunications Act of 1996: Telecommunications Carriers’ Use of Customer Proprietary Network Information and Other Customer Information; IP-Enabled Services, Report and Order and Further Notice of Proposed Rulemaking, CC Docket. No. 96-115, WC Docket. No. 04-36, 22 (continued....)

56. Our approach captures most of the expected benefits while avoiding the much larger costs associated with more intrusive options. Our approach balances (a) the need for outage information on interconnected VoIP services that facilitates improved E9-1-1 and critical communications reliability with (b) the need to minimize the associated costs and burdens imposed on this growing segment of the communications industry. Further, the Nation and consumers will benefit from increased reliability of interconnected VoIP service, specifically with respect to 9-1-1 service by bringing interconnected VoIP services within the framework the Commission has established for collaborating with industry to bring about network improvements through voluntary applications of best practices. Even a modest improvement in the reliability of 9-1-1 services potentially represents lives saved. Based on the record, our analysis concluded the net benefits will be greater with the approach we are adopting. With respect to the less stringent option, our adopted approach provides all the benefits of increased reliability at a nominal cost estimated to be less than \$1 million industrywide. With respect to the more stringent option, our approach captures most of the expected benefits while avoiding the much larger costs associated with those options.

57. While some commenters urge a period of transition before any mandatory outage reporting requirements go into effect,¹¹² we find any significant delay unjustified in light of the fact that providers already monitor this type of activity in the ordinary course of their business and that the costs of electronically reporting related outages will not be substantial. Also, the vast majority of interconnected VoIP services are provided by an entity that also provides legacy services and, therefore, has years of experience filing in NORS.¹¹³ Finally, as our ultimate approach is much more circumscribed than the one proposed in the *NPRM*,¹¹⁴ implementing the required reporting will be far less complicated. A short interval is necessary, however, to ensure that NORS updates are completed to receive these new reports and PSHSB has an opportunity to present the updates to reporting providers and resolve questions. Therefore, we will make the mandatory reporting requirement effective 90 days after the Office of Management and Budget approves the information collection and will notify providers of the exact date by public notice as soon as possible after we receive the approval from OMB.

C. Legal Authority to Require Reporting of Outages of Interconnection VoIP Service

58. In the *NPRM*, we requested comment on the Commission's legal authority to extend the Part 4 outage reporting rules to interconnected VoIP service providers.¹¹⁵ We conclude that the Commission has sufficient legal authority to require the reporting of outages of interconnected VoIP service.

59. *Comments.* Some commenters originally expressed harsh opposition to the requirements proposed in the *NPRM*: three industry commenters argue that the Commission lacks authority to take the actions proposed in the *NPRM* with regard to interconnected VoIP.¹¹⁶ Others argue that the Commission's authority is either unclear or questionable.¹¹⁷ Several parties maintain that the link between the obligation to ensure 9-1-1 compliance by VoIP service providers and the imposition of outage reporting (Continued from previous page) _____
FCC Rcd 6927 ¶¶ 51-53, 54 (2007) (extending Customer Proprietary Network Information requirements to interconnected VoIP service providers and adopting annual certification requirement).

¹¹² See, e.g., TIA Comments at 5; TIA Reply Comments at 5.

¹¹³ See *supra* note 107 and accompanying text.

¹¹⁴ *NPRM*, 26 FCC Rcd at 7186 ¶ 49.

¹¹⁵ *Id.* at 7192-93 ¶ 67-71.

¹¹⁶ AT&T Comments at 6; CTIA Comments at 12-16; Verizon Comments at 25-28.

¹¹⁷ ACA Comments at 1, 3-4; TIA Comments at 3-4. Like TIA, ATIS believes the issue of the Commission's authority needs to be resolved before we take any action. See ATIS Comments at 9.

requirements on them is too tenuous to support any assertion of direct or ancillary jurisdiction.¹¹⁸ Others suggest, however, that the Commission has some authority,¹¹⁹ or even that our authority here is “unambiguous.”¹²⁰ In more recent *ex parte* filings, many providers focus their legal objections on *NPRM* proposals that this Order does not adopt. For instance, US Telecom continues to challenge the Commission’s authority to impose outage reporting requirements for broadband services, but urges the Commission to “ensure that any reporting requirements that might be adopted are closely aligned with the Commission’s stated public policy goal of ensuring that consumers have access to emergency services. In order to accomplish this goal, the Commission should limit any reporting obligations to outages affecting a company’s own 911 facility or involving a complete loss of its interconnected VoIP service that has an actual impact on customers’ ability to reach emergency services.”¹²¹ Similarly, a group of providers jointly urges that “[w]ith respect to interconnected VoIP services . . . any outage reporting apply only to events affecting a 911 facility or involving a complete loss of service that has an actual impact on customers’ ability to reach emergency services.”¹²²

60. *Discussion.* We focus our analysis here on our authority to impose outage reporting requirements on interconnected VoIP, and not on other actions that were proposed in the *NPRM* but are not adopting here. We are not persuaded by arguments that the Commission lacks authority to extend our outage reporting requirements to interconnected VoIP service. Consistent with our mission in section 1 to “promote[e] safety of life and property,”¹²³ section 615a-1 of the Communications Act clearly imposes a “duty” on “each IP-enabled voice service [interconnected VoIP] provider to provide 9-1-1 service and enhanced 9-1-1 service to its subscribers in accordance with the requirements of the Federal Communications Commission.”¹²⁴ Further, section 615a-1(c) generally directs the Commission to issue

¹¹⁸ See, e.g., Comcast Comments at 7-8; CTIA Comments at 12-16; Verizon Comments at 35-36.

¹¹⁹ See CenturyLink Comments at 25 (“The Commission’s statutory responsibility to ensure access to 9-1-1 services by subscribers to IP-enabled voice services likely provides it with the authority to adopt outage reporting requirements for interconnected VoIP service providers that are reasonable, directly related and limited to 9-1-1 service connectivity for interconnected VoIP subscribers.”); Comcast Comments at 2 (“Comcast supports the Commission’s efforts to extend reporting requirements to [interconnected VoIP] providers.”); see XO Comments at 9 (“XO agrees that the Commission has sufficient ancillary jurisdiction to require providers of interconnected VoIP services to report outages of their mandatory 9-1-1 services.”).

¹²⁰ See NASUCA Comments at 9; NASUCA Reply Comments at 14.

¹²¹ See *Ex Parte* Notification Letter dated Feb. 1, 2012, from Glenn Reynolds, USTA, to Marlene Dortch, Secretary, FCC (filed Feb. 1, 2012); see also *Ex Parte* Notification Letter, dated Feb. 2, 2012, from Brian M. Josef, Assistant Vice President—Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC (filed Feb. 2, 2012) (referencing the “reasonableness” of “reporting obligations in the event of a full, or ‘hard outage,’ occurring to interconnected VoIP service,” relative to broader proposals in the *NPRM*); *Ex Parte* Notification Letter dated Nov. 14, 2011, from Barbara Esbin, Cinnamon Mueller for ACA, et al. to James Arden Barnett, Jr., Rear Admiral (Ret.), Chief, Public Safety and Homeland Security Bureau, FCC (filed Nov. 14, 2011) (urging the Commission “to explore less burdensome alternatives” to the *NPRM* proposals and to “develop a set of outage reporting criteria that is designed to provide meaningful information about actual service disruptions that affect access to emergency services”).

¹²² *Ex Parte* Notification Letter, dated Nov. 23, 2011, from Joseph Marx, AT&T; Melissa Newman, CenturyLink; Kathy Zachem, Comcast; Trey Forgety, NENA; Kathy Grillo, Verizon; and Brendan Kasper, Vonage, to Marlene Dortch, Secretary, FCC (filed Nov. 23, 2011).

¹²³ 47 U.S.C. § 151.

¹²⁴ 47 U.S.C. § 615a-1(a). The term “IP-enabled voice service” means “interconnected VoIP service” as defined in section 9.3 of our rules. *Id.* § 615b (8).

regulations implementing the statute.¹²⁵ Section 615a-1(c) thus grants the Commission authority to require network outage reporting with respect to interconnected VoIP services as provided herein.

61. In addition, the Communications Act grants the Commission broad authority to take necessary steps to implement the Act's mandates, and thus provides concurrent sources of authority for our actions to require network outage reporting. Sections 4(i) and 303(r) generally authorize the Commission to take any actions "as may be necessary" to ensure that interconnected VoIP providers fulfill their statutory 9-1-1 and E9-1-1 duties in section 615a-1.¹²⁶ As explained above,¹²⁷ network outage reporting for interconnected VoIP providers is one of the less intrusive means by which the Commission may monitor compliance with the statutory obligation to provide 9-1-1 and E9-1-1 service and identify and work to eliminate barriers to that compliance. Similarly, we find authority for mandatory reporting in section 403, which authorizes the Commission to launch inquiries to resolve compliance matters and other questions regarding the provisions of the Communications Act.¹²⁸ With regard to affiliates of common carriers — the subscribers of which represent an increasing share of all residential interconnected VoIP subscribers, currently over ten percent¹²⁹ — the Commission also is authorized to

¹²⁵ See 47 U.S.C. § 615a-1(c)(1) (requiring that "[t]he Commission—(1) within 90 days after July 23, 2008 issue regulations implementing [the NET 911 A]ct" and providing a non-exhaustive list of matters to address therein). Our actions here are not time-barred by the statutory deadline in Section 615a-1(c). See Section 615a-1(c)(3) (authorizing the Commission to "modify such regulations [provided for in section 615a-1(c)(1)] from time to time, as necessitated by changes in the market or technology, to ensure the ability of an IP-enabled voice service providers to comply with its obligation under section [615a-1](a) . . ."); see also *Connect America Fund: A National Broadband Plan for our Future: Establishing Just and Reasonable Rates for Local Exchange Carriers; High-Cost Universal Service Support; Developing a Unified InterCarrier Compensation Regime; Federal-State Joint Board on Universal Service; LifeLine and LinkUp; Universal Service Reform—Mobility Fund*, WT Docket No. 10-208, Report and Order and Further Notice of Proposed Rulemaking, 54 Comm. Reg. (P&F) 637, ¶ 767 n.1381 (rel. Nov. 18, 2011) (rejecting arguments that section 251(d)(1) deadline for Commission rulemaking implementing section 251 provisos barred subsequent Commission action); see also *Gottlieb v. Pena*, 41 F.3d 730, 733 (D.C. Cir. 1994) (even when an agency misses a statutory deadline, it retains jurisdiction over the matter unless Congress has set forth consequences for its failure to act, citing *Brock v. Pierce County*, 476 U.S. 253 (1986)).

¹²⁶ See 47 U.S.C. § 154(i) (authorizing the Commission to "perform any and all acts, make such rules and regulations, and issue such orders, not inconsistent with this Act, as may be necessary in the execution of its functions"); 47 U.S.C. § 303(r) (the Commission shall "[m]ake such rules and regulations and prescribe such restrictions and conditions, not inconsistent with law, as may be necessary to carry out the provisions of this Act . . .").

¹²⁷ See *supra* para. 53.

¹²⁸ See 47 U.S.C. § 403 ("The Commission shall have full authority and power at any time to institute an inquiry, on its own motion, in any case and as to any matter or thing concerning which complaint is authorized to be made, to or before the Commission by any provision of this chapter, or concerning which any question may arise under any of the provisions of this chapter, or relating to the enforcement of any of the provisions of this chapter.").

¹²⁹ Approximately 7 percent of residential interconnected VoIP subscriptions were attributable to incumbent local exchange carriers (ILECs) in June 2010, and the share had increased to approximately 9 percent by December 2010. See *March 2011 Local Competition Report*, Figure 4 (1.7M/25.2M). See also *October 2011 Local Competition Report*, Figure 4 (2.5M/27.1M). Information from corporate earnings reports suggests that the share continues to increase. See http://www2.verizon.com/idc/groups/public/documents/adacct/2011_4q_quarterly_bulletin.pdf (last visited Jan. 24, 2012), Wireline – Selected Operating Statistics showing Verizon FiOS Digital Voice residence connections totaled 1.884M in 4Q2011. See also http://www.att.com/Investor/Financial/Earning_Info/docs/4Q_11_IB_FINAL.pdf (last visited Feb. 3, 2012), Consumer Revenue Connections, note 2 showing AT&T U-verse consumer VoIP connections totaled 2.278M as of December 31, 2011. Therefore, Verizon FiOS and AT&T U-verse reported a combined total of 4.162M residential VoIP subscribers at year-end 2011, as compared to 3.218M six months earlier (+29 percent in six months). See http://www2.verizon.com/idc/groups/public/documents/adacct/2011_q2_qb.pdf (last visited Feb. 3, 2012), Wireline – Selected Operating Statistics. See also (continued....)