

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)
)
The Proposed Extension of Part 4 of the) PS Docket No. 11-82
Commission's Rules Regarding Outage Reporting)
to Interconnected Voice Over Internet Protocol)
Service Providers and Broadband Internet Service)
Providers)

COMMENTS OF CENTURYLINK

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SUMMARY

In this proceeding, the Commission proposes to adopt rules that would extend Part 4 outage reporting requirements to interconnected VoIP service providers and broadband ISPs. The Commission justifies its proposed action on the need to ensure that current and future 9-1-1 systems are as reliable and resilient as possible. It asserts that it has authority under the Communications Act to adopt the proposed rules.

CenturyLink has serious reservations about the proposed extension of the Commission's Part 4 outage reporting rules to interconnected VoIP service providers and broadband ISPs. The market-based incentives that motivate interconnected VoIP service providers and broadband ISPs to provide their customers with the most reliable services possible make the proposed rules unnecessary. Most concerning about the Commission's proposal is its use of performance-based metrics to define an event as an outage and to trigger the filing of an outage report. Defining an outage for interconnected VoIP service or broadband service on the basis of performance metrics such as packet loss, latency and jitter is misguided if the Commission's objective is to ensure that VoIP subscribers have access to 9-1-1 services. The packet loss, latency and jitter thresholds proposed by the Commission as outage reporting triggers for interconnected VoIP service providers and broadband ISPs are inconsistent with degraded VoIP service quality and do not correspond to a VoIP subscriber's inability to access 9-1-1 services. CenturyLink opposes the Commission's proposed use of performance-based metrics to define an outage or trigger the filing of an outage report. Any definition of outage, or trigger for the filing of an outage report, should be based on a VoIP subscriber's inability to connect to a Public Safety Answering Point.

The Commission's statutory duty to ensure VoIP subscriber access to 9-1-1 services likely supports its authority to adopt outage reporting requirements for interconnected VoIP

service providers and broadband ISPs that are reasonable, directly related and limited to 9-1-1 service connectivity for VoIP subscribers. The *NPRM* offers no support for a broader assertion of jurisdiction by the Commission. Even when the Commission has jurisdiction to act, it is not compelled to do so. Extending mandatory Part 4 outage reporting requirements to interconnected VoIP service providers or broadband ISPs will neither increase their existing incentive to deliver reliable service to their customers nor improve VoIP subscribers' access to 9-1-1 services.

Should the Commission nonetheless decide to go forward with outage reporting for interconnected VoIP service providers or broadband ISPs, it should first conduct a 12 to 24 month voluntary trial that would allow it to assess the viability and utility of permanent (voluntary or mandatory) outage reporting for interconnected VoIP service providers or broadband ISPs. Regardless of the voluntary or mandatory nature of any outage reporting system adopted for interconnected VoIP service providers or broadband ISPs, the data submitted by the service providers should be treated as presumptively confidential as it is today under Part 4. The current Part 4 thresholds and timelines for submitting outage data to the Commission should not be applied to interconnected VoIP service providers or broadband ISPs. If an outage reporting system is imposed upon interconnected VoIP service providers or broadband ISPs, the Commission should use the thresholds and timelines suggested in these Comments, and the data should be submitted via an electronic reporting template.

TABLE OF CONTENTS

	Page
SUMMARY.....	i
I. INTRODUCTION.....	1
II. DISCUSSION.....	5
A. OUTAGE REPORTING SHOULD NOT BE IMPOSED ON INTERCONNECTED VOIP SERVICE PROVIDERS.....	5
B. THE CURRENT PART 4 OUTAGE REPORTING RULES SHOULD NOT BE APPLIED TO BROADBAND ISPS.....	8
1. BROADBAND INTERNET ACCESS SERVICE PROVIDERS.....	8
2. BROADBAND BACKBONE ISPS.....	15
3. PROPOSED BROADBAND ISP OUTAGE REPORTING.....	16
C. VOLUNTARY REPORTING, IF ANY, SHOULD BE FAVORED.....	20
D. ALL OF THE CURRENT PART 4 REPORTING TIMELINES ARE NOT APPROPRIATE FOR INTERCONNECTED VOIP SERVICE PROVIDERS AND BROADBAND ISPS.....	21
E. CONFIDENTIALITY OF REPORTED INFORMATION IS NECESSARY.....	22
F. THE COMMISSION'S LEGAL AUTHORITY IS LIMITED.....	24
III. CONCLUSION.....	28

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COMMENTS OF CENTURYLINK

I. INTRODUCTION

CenturyLink submits these comments in response to the Federal Communications Commission's (FCC or Commission) *Notice of Proposed Rulemaking (NPRM)*¹ concerning the proposed extension of its Part 4 outage reporting rules to interconnected Voice over Internet Protocol (VoIP) service providers² and broadband Internet service providers (ISPs).³ As discussed below, CenturyLink has serious reservations about the proposed extension of the

¹ *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, Notice of Proposed Rulemaking, FCC 11-74 (rel. May 13, 2011); 76 Fed. Reg. 33686 (June 9, 2011); 76 Fed. Reg. 36892 (June 23, 2011).

² VoIP is defined 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; and (4) permits users generally to receive calls that originate on the public switched telephone network and to terminate calls to the public switched telephone network. *See* 47 C.F.R. § 9.3.

³ As defined by the Commission in the *NPRM*, the term broadband ISP includes "broadband Internet access service providers and/or broadband backbone ISPs." *NPRM* at fn. 3. It does not include "providers that only offer information content, applications, services, or devices accessed over or connected to broadband Internet access services, such as social network providers, which would not be covered by the reporting obligations proposed in the *NPRM*." *Id.* at fn. 87.

Commission's Part 4 outage reporting rules to interconnected VoIP service providers and broadband ISPs.

The Commission observes that its analysis of industry-wide outage reports for legacy circuit-switched voice and/or paging communications over wireline, wireless, cable, and satellite communications facilities, in conjunction with collaborative government-industry work efforts, has promoted the development and refinement of voluntary industry best practices.⁴ Industry's use of voluntary network reliability and resiliency best practices, along with escalating competitive pressure to continuously improve the delivery of services to customers, has produced a steady reduction in the number of circuit-switched voice communications outages. Industry's use of voluntary best practices and competition for customers are the principal drivers of the reduction in circuit-switched voice services outages.⁵ Broadband ISPs participate and share information with many federal committees, councils and work groups within the Executive Office of the President, the Department of Homeland Security (DHS), the Department of Defense, the Federal Bureau of Investigation, the State Department, the Department of Commerce, and the FCC⁶ that are engaged in public-private partnership initiatives concerning broadband infrastructure reliability and protection. Interconnected VoIP service providers and broadband ISPs also regularly work within industry organizations, such as the Alliance for Telecommunications Industry Solutions (ATIS), to examine issues concerning the reliability of broadband networks and services. While it is fair to say that the Commission's Part 4 outage reporting regime has encouraged work already undertaken by industry to develop, update and

⁴ *NPRM* at ¶ 8.

⁵ CenturyLink disagrees with the Commission's statement that current broadband ISPs are not incentivized to achieve the goal of having a nationwide broadband infrastructure that is reliable. See *NPRM* at ¶ 21.

⁶ *E.g.*, the Communications Security, Reliability and Interoperability Council (CSRIC).

implement legacy circuit-switched voice network reliability best practices, CenturyLink submits that it is not necessary for the Commission to extend its Part 4 outage reporting rules to interconnected VoIP service providers or broadband ISPs in order to ensure that voluntary best practices continue to be developed and implemented by interconnected VoIP service providers and broadband ISPs, or to address issues concerning broadband network vulnerabilities and outages.

If the Commission nonetheless decides to extend the Network Outage Reporting System (NORS) to either interconnected VoIP service providers or broadband ISPs, it should first collaborate with the service providers that would be reporting into NORS to design a voluntary 12-24 month trial reporting program. A voluntary trial program would provide the Commission with data to determine if there is a sufficient basis for permanently adopting the data collection on either a voluntary or mandatory basis. If at the end of the trial the Commission were to determine that the benefits derived from collecting the data outweighed the burdens borne by service providers, the trial will have provided the Commission with the experience needed to modify NORS for interconnected VoIP service provider and/or broadband ISP data collection in a manner that is minimally burdensome for affected service providers and that effectively and efficiently informs the Commission about the overall reliability of the Nation's broadband networks and/or interconnected VoIP services.⁷

Broadband networks and the IP services (such as VoIP) that are carried over them operate very differently than legacy communications networks and circuit-switched voice services. It

⁷ As the President noted in his *Executive Order—Regulation and Independent Regulatory Agencies*, regulatory decisions should be based on a careful analysis of the likely consequences of regulation and “made only after consideration of their costs and benefits (both quantitative and qualitative).” The White House, Office of the Press Secretary, July 11, 2011, *reprinted in* 76 Fed. Reg. 41587 (July 14, 2011).

would be impractical and extremely costly for service providers were the Commission to simply extend all the current NORS reporting criteria, thresholds and timeframes to interconnected VoIP service providers or broadband ISPs. To the extent that interconnected VoIP service providers and broadband ISPs could comply with the reporting requirements proposed in the *NPRM*, the utility of the information reported would be questionable relative to the Commission's stated goals of addressing broadband communications system vulnerabilities, helping prevent future outages through the development and refinement of best practices, and coordinating with individual and groups of reporting providers.⁸ Any outage reporting requirements imposed by the Commission upon interconnected VoIP service providers or broadband ISPs should not use performance-based metrics to define an outage or trigger outage reporting. The definition of an outage should be limited to the complete loss of service or connectivity.

CenturyLink believes that the threat environment for critical communications infrastructures such as broadband networks is high, the ability of bad actors to exploit exposed broadband network vulnerabilities is significant and there is a compelling need to safeguard sensitive information concerning broadband networks. Therefore, any broadband outage information submitted to the Commission by interconnected VoIP service providers or broadband ISPs should be treated as presumptively confidential just as information submitted pursuant to Part 4 for legacy circuit-switched voice services and the facilities carrying them are today.

The Commission's jurisdiction to extend Part 4 outage reporting requirements to interconnected VoIP providers or broadband ISPs is limited. The argument in support of it is strongest when restricted to outages directly impacting the ability of interconnected VoIP

⁸ *NPRM* at ¶ 13.

subscribers to connect with Public Safety Answering Points (PSAPs). It is tenuous when asserted to impose outage reporting on interconnected VoIP service providers or broadband ISPs in the absence of an interconnected VoIP subscriber losing the ability to connect to a PSAP.

II. DISCUSSION

A. OUTAGE REPORTING SHOULD NOT BE IMPOSED ON INTERCONNECTED VOIP SERVICE PROVIDERS.

The Commission proposes to apply its outage reporting requirements to all interconnected VoIP service providers.⁹ Interconnected VoIP service is distinguishable from the voice services covered under the current Part 4 rules. Interconnected VoIP service “is an [I]nternet application utilizing ‘packet-switching’ to transmit a voice communication over a broadband [I]nternet connection.”¹⁰ “Unlike traditional circuit-switched telephony, which establishes a dedicated circuit between the parties to a voice transmission, VoIP relies on packet-switching, which divides the voice transmission into packets and sends them over the fastest available route.”¹¹ As noted in the *NPRM*, interconnected VoIP service requires, among other things, a broadband connection from the user’s location.¹²

The Commission states in the *NPRM* that approximately 28 percent of 911 calls are made using VoIP service.¹³ There were 29 million interconnected retail and business VoIP subscribers in the U.S. in June 2010 and 122 million end-user switched access lines.¹⁴ Although there may be slightly more than 29 million interconnected retail and business VoIP subscribers in the U.S.

⁹ *Id.* at ¶ 26.

¹⁰ *Minnesota Public Utilities Commission v. FCC*, 483 F.3d 570, 574 ¶ 7 (8th Cir. 2007).

¹¹ *In the Matter of Petition for Declaratory Ruling that AT&T’s Phone-to-Phone IP Telephony Services are Exempt from Access Charges*, Order, 19 FCC Rcd 7457, 7458-59 ¶ 3 (2004).

¹² *NPRM* at fn. 2.

¹³ *Id.* at ¶ 25.

¹⁴ *Id.*

today, interconnected VoIP subscribers still only represent about 20 percent of the total number of wireline retail local telephone service subscribers in the U.S. This number is not significant enough to warrant the imposition of the Part 4 outage reporting requirements on interconnected VoIP service providers, most of whom are obligated to report outages related to the circuit-switched voice services that they also provide. In August 2004 when the Commission adopted its *New Part 4 Order*¹⁵ extending outage reporting to wireless service providers, it found that the number of wireless subscribers at the end of 2003 was 158.8 million.¹⁶ Despite steady growth, the number of interconnected VoIP subscribers in the U.S. has yet to similarly approach a level that justifies extending outage reporting requirements to their service providers.

Should the Commission nonetheless decide to extend outage reporting requirements to interconnected VoIP service providers, CenturyLink strongly believes that the definition of an interconnected VoIP outage must be limited to the complete loss of service or connectivity. The Commission stresses in the *NPRM* the importance of interconnected VoIP subscribers having access to 9-1-1 service.¹⁷ CenturyLink respectfully submits that defining an outage for interconnected VoIP service on the basis of performance-based metrics is misguided if the objective is ensuring subscriber access to 9-1-1 service. The performance metrics and thresholds proposed by the Commission in the *NPRM* for triggering outage reporting, 1 percent for packet loss, 100 milliseconds (ms) for latency and 4 ms for jitter, are not consistent with degraded VoIP service quality. Further, they wholly miss the mark for determining the availability of interconnected VoIP service to connect a subscriber to a PSAP.

¹⁵ *In the Matter of New Part 4 of the Commission's Rules Concerning Disruptions to Communications*, Report and Order and Further Notice of Proposed Rulemaking, 19 FCC Rcd 16830 (2004) (*New Part 4 Order*).

¹⁶ *New Part 4 Order*, 19 FCC Rcd at 16838 n. 18.

¹⁷ *NPRM* at ¶¶ 5, 25 and 26.

A performance-based metrics approach to determining interconnected VoIP service outages is impractical and would be extremely costly to implement nation-wide for all VoIP sessions. There are too many factors affecting the performance aspects of an interconnected VoIP subscriber's experience that are outside of the control of an interconnected VoIP service provider to reasonably ascribe total responsibility for interconnected VoIP service performance to the service provider. With respect to packet loss, latency and jitter, performance is affected by the application, the subscriber, the service provider, as well as any number of other entities and facilitators. If outage reporting is to be required of interconnected VoIP service providers, the ability of subscribers to connect to their PSAPs in order to effectively communicate with emergency personnel should drive the determination of an outage, in conjunction with the duration and scale of any loss of connectivity across a service provider's subscriber base.

CenturyLink believes that 900,000 user minutes as a threshold for triggering outage reporting by an interconnected VoIP service provider is reasonable where there is a loss of connectivity by interconnected VoIP subscribers. Service degradation should not be embodied in the definition of an outage for interconnected VoIP service. Further, there should be at least 7,500 interconnected VoIP subscribers that have lost connectivity for at least 120 minutes before an event is considered to be an interconnected VoIP service outage that must be reported by the interconnected VoIP service provider. Interconnected VoIP service events of any duration that affect fewer than 7,500 VoIP subscribers should not be considered reportable outages. If the duration of an event is less than 120 minutes, it should not be a reportable outage regardless of the number of VoIP subscribers affected.

B. THE CURRENT PART 4 OUTAGE REPORTING RULES SHOULD NOT BE APPLIED TO BROADBAND ISPS.

The Commission asks for comment on how to define broadband Internet access service provider¹⁸ and broadband backbone ISP.¹⁹ CenturyLink believes that defining a broadband Internet access service provider as a provider of mass-market retail service by wire or radio that provides the capability to transmit data to and receive data from all or substantially all Internet endpoints, including any capabilities that are incidental to and enable the operation of the communications service, but excluding dial-up Internet access service, is reasonable.

CenturyLink also believes that it is reasonable to define broadband backbone ISP to be a broadband ISP that provides long-haul transmission for one or more broadband Internet access service providers, typically transporting Internet traffic among major cities – but it should be noted that not all traffic on a broadband backbone ISP’s network is bound for the public Internet nor is it all generated by mass-market retail broadband end-users.

1. BROADBAND INTERNET ACCESS SERVICE PROVIDERS.

Although defining outage in the context of broadband Internet access service providers as the “loss of generally-useful availability and connectivity” may seem reasonable, CenturyLink submits that the definition of outage in this context should be limited to the loss of connectivity to the public Internet. “Generally-useful availability” is a term that provides no objective standard against which to measure performance. What constitutes generally-useful availability will vary by individual and the purpose for which an individual uses the Internet. The level of performance that is generally acceptable for e-mail and loading web pages is different than what constitutes generally acceptable performance for VoIP, video chats, online gaming and video

¹⁸ *NPRM* at ¶ 34.

¹⁹ *Id.* at ¶ 35.

streaming. The Commission asks whether it should “measure ‘generally-useful availability and connectivity’ of broadband Internet service as it relates to a broadband Internet access service provider as the operational state in which the transmission from the end-user to the broadband ISP Point of Presence (PoP) [footnote omitted] is operating as designed for normal use, the logical functions and relay systems required from ISPs are operating as designed for normal use, and the end-user is not prevented by the broadband Internet access service provider from establishing communications with any destination device on the global Internet that has an assigned Internet Protocol address[.]”²⁰ CenturyLink believes that the responsibility of a broadband Internet access service provider to deliver generally-useful availability and connectivity to an end-user must be limited to a broadband Internet access service provider being responsible for transporting an end-user’s communication to one or more other broadband ISPs (i.e. a broadband backbone ISP). It should be recognized that service degradation or a lost connection experienced by an end-user with respect to the end-user’s Internet access service may be out of the control of the end-user’s broadband Internet access service provider. It is impossible for a broadband Internet access service provider to assure the delivery of an end-user’s communication to any destination of the end-user’s choosing on the Internet. Once an end-user’s broadband Internet access service provider has delivered the end-user’s communication to another broadband ISP, the end-user’s broadband Internet access service provider no longer has control over, visibility to, or the ability to affect the end-user’s communication.

The Commission asks whether the loss of generally-useful availability and connectivity can be measured using metrics such as packet loss, round-trip latency, or jitter from the source to

²⁰ *Id.* at ¶ 41.

the destination host.²¹ Broadband ISPs are only able to control the network elements under their physical control. The Internet is a network of networks, and the notion of a single ISP being responsible for the delivery of an Internet communication from the source of the communication to the destination host is unreasonable and not technically feasible. Likewise, it is equally unrealistic to expect a broadband Internet access service provider to be able to identify, after it has handed off the communication to another broadband ISP without trouble, where in an end-to-end Internet transmission degradation in the transmission occurs or where a connection may be lost in another broadband ISP's network. Even if the endpoint is within the broadband Internet access service provider's network, gathering useful performance-based metrics from end-users' broadband access lines is fraught with issues and not a useful or scalable way to accomplish outage reporting for mass-market retail Internet access service.

It is not useful to include mass-market end user premises in performance-based or outage monitoring. In the mass-market retail broadband sector, one of the network endpoints (the end-user's public IP address) is within the end-user's premise and the broadband access line and the home network behind it are under the physical control of the end-user – not the broadband Internet access service provider. An end-user could, for example, shut down his/her modem. If the end-user's broadband Internet access service provider were monitoring the broadband access line, the modem shut down would look like a service outage. End-users can also affect performance metrics such as latency, jitter and packet loss. The manner of use of the broadband access line by an end-user affects these performance metrics.²² For example, an end-user

²¹ *Id.* at ¶ 42.

²² *Measuring Broadband America, A Report on Consumer Wireline Broadband Performance in the U.S.*, FCC Office of Engineering and Technology and FCC Consumer and Governmental Affairs Bureau (presenting the results of the Commission's first nationwide test of residential

uploading a large movie or downloading many files at once on a DSL line could use all available capacity (upstream or downstream) and delay or drop packets that would affect the performance of the broadband access service. This would affect the latency and packet loss metrics on the end-user's broadband access line, as well as the jitter metrics since jitter is latency variance. End-users within a DSL architecture could also disable the response to the Internet Control Message Protocol (ICMP) pings in the modems or third party routers/computers that are connected to it (end-users can and do bridge modems to computers and routers) which disables the ability of a broadband Internet access service provider's network to track those end-users. Packet loss could occur within an end-user's home network due to a multitude of conditions and appear as something within the broadband Internet access service provider's transmission path.

CenturyLink believes that performance-based metrics should not be used in broadband Internet access service outage reporting. Within a broadband Internet access network, gathering useful data related to these metrics would be very difficult for an ISP, and as previously discussed, factors affecting these metrics are often under the control of end users. Unlike the broadband backbone network, the broadband access network utilizes a wide range of technologies and geographic conditions. These can differ between rural and urban service areas given the usually more complicated backhaul, older technologies like ATM, slower interfaces, differing connection speeds, and more devices in the transmission path. Latency varies among fiber, microwave and copper facilities and also among the technologies used for an end-user's broadband access connection. In older Asynchronous Digital Subscriber Line (ADSL) technology, interleaving (an error correction technique) can cause the "first hop"²³ latency to be

wireline broadband service) (rel. Aug. 2, 2011) (*Residential Broadband Speed Test Report*), at p. 9.

²³ The first link in the transmission path from an end-user's modem to the gateway device.

32 ms or more. This combined with any distance traveled can mean that end-users may have 120 ms or more latency to an endpoint on a normal, fully operating Internet connection.

The Commission asks how the number of potentially affected users should be counted for broadband Internet access service providers.²⁴ Depending on where an event occurs, CenturyLink is able to use a mixture of methods to determine how many possible end-users may have been affected by a service disruption. In most cases, provisioning systems would supply customer counts on an edge element (such as a DSLAM or gateway router). Where end-user traffic is aggregated, such as in the ATM, Metro Ethernet or broadband backbone network, it is much harder to determine exactly how many end-users may have been on a link due to routing and redundancy. CenturyLink may only be able to provide estimates of the maximum number of customers potentially affected based on traffic drop. An example of this would be if there was an outage and a trunk's traffic dropped by 400 million bits per second (Mbps). If the current traffic per customer is 100 kilobits per second (Kbps), an estimate could be made that 4,000 customers may have been affected. Active Internet sessions could also be used as an estimate; however, customers frequently self-disconnect from the network and, in addition, residential power outages in homes will cause modems and computers to lose power causing traffic and IP address drops.

The Commission asks whether a construct similar to that applied to wireless service providers today for voice services should be used for non-mobile broadband access users to arrive at an estimate of potentially affected users in an outage.²⁵ While it is true that all broadband lines may not be actively in use by end-users at the time of an event, CenturyLink feels that for wireline broadband access connections it is clearer to simply state the maximum

²⁴ *NPRM* at ¶ 42.

²⁵ *Id.*

number of broadband access service end-users that may have been affected. If all service providers use that maximum, it makes it simple for everyone and removes the need to update a ratio later as patterns shift. The Commission asks if broadband Internet access service providers should be required to submit outage reports when they experience outages or service degradation for at least 30 minutes: on any major facility that it owns, operates, leases, or otherwise utilizes potentially affecting generally-useful availability and connectivity of at least 900,000 user minutes.²⁶ CenturyLink believes that 900,000 user minutes as a threshold for triggering outage reporting by a broadband Internet access service provider where there is a loss of connectivity to the Internet by end-users is reasonable. However, CenturyLink does not believe that service degradation should be embodied in the definition of outage for broadband Internet access service providers. Further, CenturyLink believes that there should be a minimum number of end-users that are affected by a loss of connectivity to the Internet before an event is considered to be an outage for broadband Internet access service providers. That minimum number of affected end-users should be 7,500, and the duration of the event should be 120 minutes or more before outage reporting is required (equivalent to 900,000 user minutes). Events of any duration impacting fewer than 7,500 end-users should not be considered reportable outages. If the duration of an event is less than 120 minutes, it should not be a reportable outage regardless of the number of end-users affected.

The Commission should not use performance-based metrics such as the proposed packet loss, latency and jitter metrics as a basis for triggering outage reporting by broadband Internet access service providers. There is no economically feasible way to track and process such

²⁶ *Id.* at ¶ 43.

performance metrics in the mass-market setting given the lack of service provider control over end-users' premises, equipment or line usage.²⁷

With respect to special offices and facilities,²⁸ CenturyLink believes that it is reasonable for broadband Internet access service providers to file outage reports for events that affect special offices and facilities such as major military installations, key government facilities, nuclear power plants, airports and PSAPs.

The Commission solicits comments concerning the costs, burdens, and benefits associated with its proposed outage reporting requirements for broadband Internet access service providers.²⁹ CenturyLink believes that the benefits of the Commission's proposal are minimal given the challenges surrounding individual end-user monitoring in the mass-market setting and the costs and burdens are very high if performance metrics such as end-user latency, jitter and packet loss measurements are used in establishing thresholds for triggering mandatory outage reporting. Broadband Internet access service providers have an inherent desire to provide their end-user customers with a highly reliable Internet access service given the fierce competition that exists for more technically sophisticated customers and the constant introduction of new applications. Broadband Internet access service providers continuously strive to meet the demands of their customers. Mandatory outage reporting for broadband Internet access service providers is unnecessary.

²⁷ In the Commission's recently concluded residential broadband speed test, each end-user that participated in the test was required to have a separate customized router placed inline with their broadband access connection, and many servers were placed around the country to test against. *See Residential Broadband Speed Test Report* at p. 10. The Commission's test illustrates that it is costly and difficult to gather detailed data on individual consumer broadband access lines.

²⁸ *See NPRM* at ¶ 43.

²⁹ *Id.* at ¶ 44.

2. BROADBAND BACKBONE ISPS.

With respect to broadband backbone ISPs, the Commission asks whether the loss of generally-useful availability and connectivity can be measured using metrics such as packet loss, round-trip latency or jitter as measured from source to destination PoP.³⁰ The Commission concludes that the appropriate values to trigger outage reporting for broadband backbone ISPs “should be packet loss of one percent or more, round-trip latency of 100 ms or more, or jitter of 4 ms or more as measured from source to destination PoP[.]”³¹ The Commission asks for comment on its conclusion concerning the use of these performance metrics and values to trigger outage reporting for broadband backbone ISPs and whether these values are appropriate for all types of broadband backbone ISPs.³² CenturyLink opposes the use of performance-based metrics as triggers for outage reporting for broadband backbone ISPs. Only events causing the loss of connectivity should be reported.

The Commission asks whether the failure of routers, network servers, or some other types of communications equipment should be reportable and whether PoPs, core routers, root name servers or authoritative DNS servers should be included on the list of equipment subject to reporting. It must be noted that only a portion of the equipment at a broadband backbone ISP’s location, and the traffic passing through that location, may be mass-market related. A major PoP³³ failure could be a significant outage if it affected the connectivity of 7,500 end-users for 120 minutes or more. In such a case, CenturyLink believes that it would be reasonable to report a major PoP failure as an outage. The loss of any one router should not automatically trigger the

³⁰ *Id.* at ¶ 48.

³¹ *Id.*

³² *Id.*

³³ Not all PoPs qualify as major PoPs. PoPs vary in size and the number of customers potentially impacted by a PoP failure for a particular duration.

reporting of an outage given the diversity that exists in broadband backbone networks and the minor impact that the failure of one router would have on end-users. DNS architecture is built to have redundant servers and special routing to allow end-users to use DNS servers in a different PoP if a DNS server failure occurs within their local area. CenturyLink agrees that the full loss of DNS across a network could be an event triggering an outage report given DNS's important role for end-users. Whether such an event should be reportable as an outage would depend on the event's ultimate end-user impact and duration.

3. PROPOSED BROADBAND ISP OUTAGE REPORTING.

The Commission presents five scenarios in the *NPRM* to illustrate the types of ISP outages to which it proposes to extend its Part 4 rules and asks if the examples of outages unique to ISPs should trigger the outage reporting being proposed.³⁴ CenturyLink provides its comments below to the scenarios based on the outage reporting thresholds proposed in the *NPRM*. CenturyLink's comments should not be read to imply support for a particular proposed threshold or the proposed rules generally.

In *Scenario No. 1*, a broadband Internet access service provider experiences an outage of service of a regional PoP affecting 30,000 subscribers for 30 minutes aggregated across all access arrangements. According to the *NPRM*, "affecting 30,000 subscribers for 30 minutes aggregated across all access arrangements" means affecting, for example, "a mix of 10,000 Cable Modem subscribers, 10,000 DSL subscribers, and 1,000 dial-in ports serving potentially 10,000 dial-up subscribers[.]"³⁵ Arguably, under proposed Rule 4.9(h)(2)³⁶ this scenario could constitute a reportable outage if the "outage of service" of the regional PoP resulted in a

³⁴ *NPRM* at ¶¶ 51-54.

³⁵ *Id.* at ¶ 51 & fn.112.

³⁶ *Id.* at Appendix A.

complete loss of service, or met the specified performance thresholds for average packet loss, average round-trip latency or average jitter, for the entirety of the 30 minutes. If the event results in a complete loss of connectivity, CenturyLink would propose that the minimum duration of the event be 120 minutes before the reporting of an outage is triggered. Given this duration threshold, it seems appropriate that an event affecting the connectivity of 30,000 customers would trigger the reporting of an outage. The scenario, though, begs the question of the data actually being available to broadband Internet access service providers on a customer-specific basis to determine whether the thresholds specified in the proposed rule have been met, and to the extent that the necessary data could be obtained, the cost of obtaining it and their utility as accurate measures of end-users' perceptions of the generally-useful availability of their Internet access service for their particular uses. Arbitrary thresholds for average packet-loss, average round-trip latency or average jitter, particularly in the mass market setting, are not credible measures of the generally useful availability of Internet access in a broadband Internet access service provider's service area since there is no ascertainable fixed average use of the Internet by end users. As noted above, what constitutes generally-useful availability of Internet access service will constantly vary over time by end-user, by the purposes for which end-users use the Internet, and by the devices used by end-users to access the Internet.

In *Scenario No. 2*, a broadband backbone ISP experiences an outage of a PoP for 30 minutes. Proposed Rule 4.5(i) defines Internet PoP as “the facility at which an Internet Service Provider connects to its end users” and “usually includes routers, digital/analog call aggregators, servers, and frequently frame relays or Asynchronous Transfer Mode (ATM) switches.”³⁷ Proposed Rule 4.9(i) would require a broadband backbone ISP to report as an outage any loss of

³⁷ *Id.*

a PoP for 30 minutes or longer.³⁸ In CenturyLink's experience, PoPs vary in size and the number of customers potentially affected by "the loss of a PoP" will also vary. The loss of a large metropolitan PoP would be a significant event potentially affecting hundreds of thousands of customers. Reporting such an event is not unreasonable. There are, though, situations where the loss of a smaller PoP would not be a significant event in terms of the number of customers potentially affected. Accordingly, requiring the reporting of the loss of any PoP for 30 minutes or longer is too encompassing, and CenturyLink would propose a 120 minute minimum loss duration before the loss of a PoP is deemed reportable as an outage.

In *Scenario No. 3*, a broadband ISP experiences the isolation of a PoP for at least 30 minutes, possibly from the loss of a transmission link from a hub PoP to a spoke PoP. The scenario presented gives no additional detail as to potential customer impact occasioned by the "isolation" of the PoP. As noted in the *NPRM*, in the Commission's view, the loss of a transmission link is not limited to a complete transmission loss "but also encompasses a high packet loss rate on a link experiencing degraded operation."³⁹ The Commission notes that it is "generally accepted" that packet loss in the range of five to 25 percent, depending on an application's requirements, renders IP-based communications unusable. CenturyLink believes that it is not unreasonable to report the isolation of a large PoP lasting for at least 120 minutes as a result of the complete or virtually complete loss of a transmission link, depending on the size of the isolated PoP and the resulting potential affect on customers. It is extremely unlikely, though, to have a large PoP networked with a hub and spoke given the design criteria of having redundant backbone links to at least two other PoPs.

³⁸ *Id.*

³⁹ *Id.* at fn. 113.

In *Scenario No. 4*, there is an outage of at least 30 minutes of an inter-ISP link with a data rate greater than 1 gigabit per second (Gbps). CenturyLink believes that absent additional information demonstrating a significant potential affect on customers, such an incident should not necessarily require an outage report. There are redundant links between and among ISPs. The loss of any individual inter-ISP link may have no perceptible affect on customers' ability to use the Internet. Given the size of most backbone links, an inter-ISP link failure resulting in the loss of connectivity with outside networks for more than 120 minutes may warrant reporting the event as an outage. However, it is very difficult to ascertain how many mass-market end-users may be on a backbone link that has a mixture of traffic types not all of which are destined for the public Internet or generated by mass-market broadband end-users.

In *Scenario No. 5*, a router within an Exchange Point is out of operation for 30 minutes or more, or experiences a one-percent or greater packet loss for 30 minutes or more. It is assumed by the Commission "that the very existence of an Exchange Point suggests a traffic volume for upwards of 30,000 potential end users" and would degrade connectivity for end-users.⁴⁰ Peering points are only one of many links to other networks and thus the global public Internet, and the network is designed to reroute traffic in such a case and absorb any extra traffic. Networks are built with spare capacity on each link in order to deal with the failure of any single element. Large backbone and peering routers have dual power supplies and dual routing engines, and due to the distributed nature of the links with other broadband ISPs, they have geographical redundancy. A broadband ISP typically peers with multiple broadband ISPs in many locations and has peering arrangements with the same broadband ISP in many locations. In a situation like the one presented in this scenario, traffic that would have flowed through the failed router in the

⁴⁰ *Id.* at fn. 117.

Exchange Point would, in the normal course of business, be re-routed through another router or Exchange Point. There may or may not be a perceptible increase in latency in the transmission due to the re-routing. Nonetheless, the incident presented in the scenario would be unlikely to produce service-affecting impacts to customers that would warrant reporting an outage.

C. VOLUNTARY REPORTING, IF ANY, SHOULD BE FAVORED.

The Commission proposes mandatory outage reporting for interconnected VoIP service providers and broadband ISPs as is the case for services subject to its Part 4 rules today.⁴¹ As discussed earlier in these comments, CenturyLink believes that no outage reporting by interconnected VoIP service providers or broadband ISPs is necessary in order to achieve the Commission's goals of addressing broadband communications system vulnerabilities, helping prevent future outages through the development and refinement of best practices, and coordinating with individual and groups of reporting providers. These goals can be accomplished through the work of existing federal advisory committees such as CSRIC,⁴² public-private work groups; industry forums; and voluntary information sharing between the Commission and interconnected VoIP service providers and broadband ISPs.

If the Commission decides to pursue outage reporting for interconnected VoIP and/or broadband ISPs, it should first engage the affected service providers in a collaborative process to determine the relevant metrics and thresholds for defining an outage concerning their services

⁴¹ *Id.* at ¶ 56.

⁴² CSRIC provides recommendations to the Commission on matters such as best practices to promote reliable 911, E-911 and Next Generation 911 service; best practices to make communications networks more secure, resilient and defensible from Internet-based attacks; and promoting the development of a broadband-based, next generation alerting system to distribute emergency alerts and warnings to the public. Its participants include representatives from a broad range of organizations including federal, state, local and tribal governments; communications services providers; providers of online services; business users dependent upon communications systems; and consumer and community groups.

and facilities. The Commission should then conduct a 12 to 24 month trial during which the affected service providers could voluntarily report outages, over an Internet-based system, applying the agreed upon metrics and thresholds. At the end of the trial, the results should be assessed and a tentative conclusion reached about whether there is a sufficient basis to continue with outage reporting on either a voluntary or mandatory basis. If the tentative conclusion is to continue the outage reporting, voluntary outage reporting could be continued or a further rulemaking proceeding initiated regarding the adoption of mandatory reporting into NORS. Appropriate modifications to NORS for interconnected VoIP service providers and/or broadband ISPs based on the experience gained from the trial should be made if reporting is continued.

D. ALL OF THE CURRENT PART 4 REPORTING TIMELINES ARE NOT APPROPRIATE FOR INTERCONNECTED VOIP SERVICE PROVIDERS AND BROADBAND ISPS.

Should the Commission proceed to adopt mandatory outage reporting for interconnected VoIP service providers and/or broadband ISPs, it should not apply the 30 minute event duration period as one of the triggers for reporting an event as an outage. For interconnected VoIP service providers and broadband ISPs, an event should last at least 120 minutes, and meet all other adopted thresholds, before it must be reported as an outage by either of them.

The differences between the legacy voice services covered under Part 4 today and interconnected VoIP and broadband ISP services are such that it would be unworkable to apply the same timeline as currently applied to legacy voice services for notifying the Commission of a reportable outage. Rather, for both interconnected VoIP service providers and broadband ISPs, notification of the occurrence of a reportable outage should not be required in less than four hours from the point of discovery. If the Commission requires the filing of an Initial Report for an interconnected VoIP service outage or a broadband service outage, service providers should have a minimum of 72 hours from the point at which the Notification was filed to file the Initial

Report. Interconnected VoIP service providers and broadband ISPs should be allowed at least 30 days from the point at which the Notification was filed to file a Final Report.

The Commission asks for comment on its proposal to use an electronic reporting template for the reporting of interconnected VoIP and broadband service outages should it extend outage reporting to the providers of these services.⁴³ CenturyLink supports the Commission's use of an electronic reporting template should the Commission extend outage reporting to interconnected VoIP service providers and broadband ISPs.

E. CONFIDENTIALITY OF REPORTED INFORMATION IS NECESSARY.

The Commission asks for comment on whether outage information that is collected from interconnected VoIP service providers and broadband ISPs should be treated as presumptively confidential as is the case for data currently collected pursuant to the NORS.⁴⁴ CenturyLink believes that the reasons supporting the Commission's decision to make NORS submissions presumptively confidential in 2004 are as relevant and persuasive today as they were when the decision was initially made.⁴⁵ Should the Commission extend outage reporting to either interconnected VoIP service providers or broadband ISPs, disclosure of the outage data would likely cause competitive harm; enable access to sensitive communications infrastructure information by those committed to disrupting communications; and discourage forthright disclosure by service providers.⁴⁶ Accordingly, outage data submitted to the Commission by interconnected VoIP service providers or broadband ISPs should be treated as presumptively confidential, as it is today under Part 4. Further, CenturyLink opposes the public reporting of the

⁴³ *NPRM* at ¶ 62.

⁴⁴ *Id.* at ¶ 66.

⁴⁵ *See New Part 4 Order*, 19 FCC Rcd at 16855 ¶ 45.

⁴⁶ *Id.*

aggregated data of individual reporting service providers. Aggregated data without context will allow for misimpressions and erroneous inferences to be drawn concerning the reliability and health of the networks and services of reporting service providers, as well as misleading comparisons among service providers. CenturyLink would not oppose the public reporting of the aggregated data of all reporting service providers in a manner that precludes individual service provider data from being identified.

In its comments in the *New Part 4 Proceeding*, DHS addressed the danger to critical communications infrastructure posed by the public disclosure of service disruption information reported to the Commission and concluded that “any expansion of the outage reporting rule[s] adopted by the Commission must be accompanied by appropriate measures to safeguard reporting data to the maximum extent consistent with applicable information access laws.”⁴⁷ The threat environment for critical communications infrastructures is higher than ever, the ability of hackers and terrorists to exploit exposed network vulnerabilities is greater, and the need to safeguard sensitive outage data concerning broadband networks and the IP services carried over them is critical.

Currently, the Commission shares information submitted to it pursuant to Part 4 with DHS on a confidential basis. Any additional outage data reported to the Commission as a result of an expansion of the scope of NORS reporting should receive the same confidential treatment. To the extent that other governmental entities seek access to outage data reported to the Commission, access should only be provided on a need to know basis in accordance with the confidential information sharing arrangement that exists with DHS. Because the open records laws in some states may limit the ability of those states to protect outage data from public

⁴⁷ See Comments of the Department of Homeland Security, filed June 2, 2004, ET Docket No. 04-35 at 14.

disclosure, outage data should only be shared with a State upon a showing that the information sought is needed by the State, that the State has the legal ability to keep it confidential, that the State commits to keeping the data confidential, and that the State agrees to reasonable restrictions.

F. THE COMMISSION'S LEGAL AUTHORITY IS LIMITED.

In the introduction to the *NPRM*, the Commission states that its proposed extension of its Part 4 outage reporting requirements to interconnected VoIP service providers and broadband ISPs “will help ensure that our current and future 9-1-1 systems are as reliable and resilient as possible and assist our Nation’s preparedness for man-made or natural disasters, such as Hurricane Katrina.”⁴⁸ The Commission also discusses its rule requiring that interconnected VoIP service providers supply 9-1-1 calling capabilities to their customers.⁴⁹ Later in the *NPRM*, the Commission asserts that it “has direct statutory authority to protect and promote the availability of 9-1-1 services for customers of interconnected VoIP services[.]”⁵⁰ It asks for comment on its assertion of authority to adopt outage reporting rules for interconnected VoIP service providers as proposed in the *NPRM*.⁵¹

Congress has given the Commission an important role with respect to establishing 9-1-1 as a national access number for emergency services and ensuring that the customers of interconnected VoIP service providers have 9-1-1 access. The Commission has historically played a significant role in the public safety area and has the responsibility to encourage and support efforts by states to deploy comprehensive, end-to-end emergency communications

⁴⁸ *NPRM* at ¶ 1.

⁴⁹ *Id.* at ¶ 5. *See also* ¶ 23.

⁵⁰ *Id.* at ¶ 22.

⁵¹ *Id.* at ¶ 67.

infrastructure and programs.⁵² Congress gave the Commission the responsibility to “designate 9-1-1 as the universal emergency telephone number within the United States for reporting an emergency to appropriate authorities and requesting assistance.”⁵³ Congress imposed upon IP-enabled voice service providers the duty to provide 9-1-1 service access to their subscribers in accordance with requirements set forth by the Commission and expressly authorized the Commission to adopt regulations necessary to ensure the ability of IP-enabled voice service providers to fulfill their duty to provide 9-1-1 service access to their subscribers.⁵⁴ 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.⁵⁵

The Commission’s jurisdiction to require outage reporting by interconnected VoIP service providers in circumstances other than when an interconnected VoIP service or facilities failure prevents subscribers from reaching 9-1-1 emergency services is not demonstrated in the *NPRM*. The Commission has yet to classify interconnected VoIP service as either a telecommunications service or an information service. The *NPRM* offers no guidance on the matter of the regulatory classification of interconnected VoIP service. *Comcast v. FCC*⁵⁶ raises

⁵² See 47 U.S.C. § 615.

⁵³ 47 U.S.C. § 251(e) (3).

⁵⁴ 47 U.S.C. § 615a-1(a) and (c).

⁵⁵ Degradation in the quality of an interconnected VoIP 9-1-1 call that does not prevent a subscriber from connecting to a PSAP or prevent a PSAP from obtaining available information from a subscriber could not serve as a basis for requiring an outage report since such a threshold is not directly related and limited to 9-1-1 service availability for the interconnected VoIP subscriber.

⁵⁶ *Comcast v. FCC*, 600 F.3d 642 (D.C. Cir. 2010).

substantial doubts about the Commission's jurisdiction to impose regulations on information services absent express statutory authority to do so.⁵⁷ If interconnected VoIP service is an information service, the Commission's ability to impose Part 4 outage reporting requirements on interconnected VoIP service providers outside of the 9-1-1 service availability (connectivity) context is lacking absent express statutory authority to do so, and no such express statutory authority is identified in the *NPRM*. As the Commission notes in the *NPRM*, it may only exercise its ancillary authority "when '(1) the Commission's general jurisdictional grant under Title I [of the Communications Act] covers the regulated subject and (2) the regulations are reasonably ancillary to the Commission's effective performance of its statutorily mandated responsibilities.'"⁵⁸ Accordingly, if interconnected VoIP service is an information service, the Commission's ability to use performance-based metrics to define an outage appears lacking based on the analysis of its jurisdiction offered in the *NPRM*.

Even where the Commission has jurisdiction to act, though, it cannot act arbitrarily or capriciously. Interconnected VoIP subscribers still only represent about 20 percent of the total number of wireline retail local telephone service subscribers in the U.S. Imposing outage reporting requirements, particularly those tied to performance-based metrics, on interconnected VoIP providers, most of which also provide legacy voice service that is subject to the current

⁵⁷ "It is true that 'Congress gave the [Commission] broad and adaptable jurisdiction so that it can keep pace with rapidly evolving communications technologies.' Resp't's Br. 19. It is also true that '[t]he Internet is such a technology,' *id.*, indeed, 'arguably the most important innovation in communications in a generation,' *id.* at 30. Yet notwithstanding the 'difficult regulatory problem of rapid technological change' posed by the communications industry, 'the allowance of wide latitude in the exercise of delegated powers is not the equivalent of untrammelled freedom to regulate activities over which the statute fails to confer . . . Commission authority.' *NARUC II*, 533 F.2d at 618 (internal quotation marks and footnote omitted). Because the Commission has failed to tie its assertion of ancillary authority over Comcast's Internet service to any 'statutorily mandated responsibility,' *Am. Library*, 406 F.3d at 692, we grant the petition for review and vacate the *Order*." *Comcast v. FCC*, 600 F.3d at 661.

⁵⁸ *NPRM* at ¶ 68, citing to *Comcast v. FCC* (600 F.3d at 646).

Part 4 rules, would impose additional costs and administrative burdens that are not justified by the current number of interconnected VoIP subscribers. Interconnected VoIP service providers participate in industry and government-sponsored best practices initiatives that include the development of interconnected VoIP service best practices. Their voluntary use of interconnected VoIP service best practices, in conjunction with competition-driven pressure to win and retain customers, serves to ensure that interconnected VoIP service is as reliable and resilient as possible. Extending mandatory Part 4 outage reporting to interconnected VoIP service providers will not increase their incentive to deliver reliable service to their customers, nor is it likely to improve interconnected VoIP subscriber access to 9-1-1 services.

Broadband is an information service, and *Comcast v. FCC*, as discussed above, also raises substantial doubts about the Commission's authority to impose Part 4 outage reporting requirements on broadband ISPs absent express statutory authority to do so. No such express statutory authority is identified in the *NPRM*. For any broadband ISP outage reporting requirements to be sustainable as reasonably ancillary to ensuring that interconnected VoIP providers are able to satisfy their 9-1-1 availability duties, they too must be reasonable, directly related and limited to 9-1-1 service availability (connectivity) for interconnected VoIP subscribers. Further, the Commission's jurisdiction to use performance-based metrics to define a broadband service outage is not demonstrated in the *NPRM*.

Broadband ISPs continuously strive to fulfill customers' service quality and reliability expectations by diligently following comprehensive network planning, engineering, deployment, maintenance, replacement, repair and recovery practices. CenturyLink encourages the Commission to exercise restraint and not adopt outage reporting requirements for broadband

ISPs. Doing so will only serve to divert time and resources away from these practices that have proven effective in producing reliable broadband networks.

III. CONCLUSION

Part 4 outage reporting should not be extended to interconnected VoIP service providers or broadband ISPs. Interconnected VoIP service providers and broadband ISPs have market-based incentives that motivate them to provide their customers with the most reliable services possible. Further, they continue to work diligently to develop, update and implement best practices that are integral to continuously improving the reliability of their networks and services. Mandatory outage reporting for interconnected VoIP service providers and broadband ISPs is unnecessary, and the associated costs and burdens for the service providers are not justified by the limited benefits that may accrue.

If an outage reporting program for interconnected VoIP service providers or broadband ISPs is adopted, it should be a voluntary trial program. A voluntary trial program would provide the Commission with data to determine if there is a sufficient basis for adopting a voluntary or mandatory permanent outage reporting program.

Any mandatory outage program that is adopted for interconnected VoIP service providers or broadband ISPs should define an outage to be the complete loss of service or connectivity. Defining an outage on the basis of performance-based metrics is misguided if the Commission's objective is ensuring reliable interconnected VoIP subscriber access to 9-1-1 service. Service degradation should not be embodied in the definition of an outage for interconnected VoIP service providers or broadband ISPs. The existing Part 4 thresholds and timelines for reporting outages should not be applied to interconnected VoIP service providers or broadband ISPs. If the Commission adopts mandatory outage reporting for interconnected VoIP service providers or broadband ISPs, it should use the thresholds and timelines suggested herein by CenturyLink.

The reasons supporting the Commission's decision to make NORS submissions presumptively confidential in 2004 are as relevant and persuasive today as they were when the Commission initially made that decision. Any outage data submitted to the Commission by interconnected VoIP service providers or broadband ISPs should be treated as presumptively confidential just as it is today under Part 4.

The Commission's statutory responsibility to ensure access to 9-1-1 services by subscribers to IP-enabled voice services likely supports a limited assertion of jurisdiction to adopt outage reporting requirements for interconnected VoIP service providers and broadband ISPs that are reasonable, directly related and limited to 9-1-1 service connectivity for interconnected VoIP subscribers. The Commission has not demonstrated in the *NPRM* that it has the jurisdiction to go further.

Respectfully submitted,

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August 8, 2011

CERTIFICATE OF SERVICE

I, Richard Grozier, do hereby certify that I have caused the foregoing **COMMENTS OF CENTURYLINK** to be: 1) filed via ECFS with the Office of the Secretary of the FCC in PS Docket No. 11-82; 2) served via e-mail on Ms. Joyce Jones (joyce.jones@fcc.gov) of the Wireless Telecommunications Bureau of the FCC; and 3) served via e-mail on the FCC's duplicating contractor, Best Copy & Printing, Inc. at fcc@bcpiweb.com.

/s/ Richard Grozier

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