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

MAILED

JUN 30 2008

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In the Matter of
Telecommunications Relay Services and
Speech-to-Speech Services for
Individuals with Hearing and Speech Disabilities
E911 Requirements for IP-Enabled Service
Providers
CG Docket No. 03-123
WC Docket No. 05-196

REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING

Adopted: June 11, 2008

Released: June 24, 2008

Comment Date: [21 days after publication in the Federal Register]

Reply Comment Date: [36 days after publication in the Federal Register]

By the Commission: Chairman Martin and Commissioners Copps, Adelstein and Tate issuing separate statements.

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I. INTRODUCTION

1. In this *Report and Order (Order)*, we adopt a system for assigning users of Internet-based Telecommunications Relay Services (TRS),¹ specifically Video Relay Service (VRS)² and Internet Protocol (IP) Relay,³ ten-digit telephone numbers linked to the North American Numbering Plan (NANP).⁴ The numbering system adopted herein will further the functional equivalency mandate by ensuring that Internet-based TRS⁵ users can be reached by voice telephone users in the same way that

¹ TRS, created by Title IV of the Americans with Disabilities Act of 1990, enables a person with a hearing or speech disability to access the nation's telephone system to communicate with voice telephone users through a relay provider and a Communications Assistant (CA). See Pub. L. No. 101-336, § 401, 104 Stat. 327, 336-69 (1990); 47 U.S.C. § 225; 47 C.F.R. § 64.601 *et seq.* (implementing regulations).

² VRS is an Internet-based form of TRS that allows individuals with hearing or speech disabilities to communicate using sign language through video equipment. The video link allows the CA to view and interpret the VRS user's signed conversation, and relay the conversation back and forth between the VRS user and the called party. See 47 C.F.R. § 64.601(17); *Telecommunications Relay Services for Individuals with Hearing and Speech Disabilities*, CC Docket No. 98-67, Report and Order and Further Notice of Proposed Rulemaking, 15 FCC Rcd 5140, 5152-54, paras. 21-27 (Mar. 6, 2000) (*2000 TRS Order*).

³ IP Relay is an Internet-based form of TRS that permits individuals with hearing or speech disabilities to communicate in text using a computer (or other similar device) and the Internet, rather than with a teletypewriter (TTY) and the Public Switched Telephone Network (PSTN). See *Provision of Improved Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CC Docket No. 98-67, Declaratory Ruling and Second Further Notice of Proposed Rulemaking, 17 FCC Rcd 7779 (Apr. 22, 2002) (*IP Relay Declaratory Ruling & Second FNPRM*).

⁴ The NANP is the basic numbering scheme that permits interoperable telecommunications service within the United States, Canada, Bermuda, and most of the Caribbean. See *Administration of the North American Numbering Plan*, CC Docket No. 92-237, Report and Order, 11 FCC Rcd 2588, 2590, para. 3 (July 13, 1995) (*NANP Order*).

⁵ We use the term "Internet-based TRS" herein to refer to both VRS and IP Relay, unless otherwise specified. Although presently there is a third Internet-based form of TRS – IP captioned telephone service (IP CTS) – we will (continued....)

voice telephone users are called. The measures we adopt today also are intended to ensure that emergency calls placed by Internet-based TRS users will be routed directly and automatically to the appropriate emergency services authorities by Internet-based TRS providers. Consistent with the *Interim Emergency Call Handling Order*,⁶ we require that the ten-digit numbering plan set forth herein be implemented no later than December 31, 2008. In the accompanying *Further Notice of Proposed Rulemaking (Further Notice)*, we seek comment on additional issues relating to the assignment and administration of ten-digit telephone numbers for Internet-based TRS.

II. BACKGROUND

2. *Telecommunications Relay Services.* Title IV of the Americans with Disabilities Act of 1990 (ADA) requires the creation of a nationwide TRS program to allow persons with hearing and speech disabilities access to the nation's telephone network.⁷ Title IV requires that TRS be available to the extent possible and in the most efficient manner,⁸ and that relay services offer access to the telephone system that is "functionally equivalent" to voice telephone services, as reflected in the TRS mandatory minimum standards.⁹ The functional equivalency standard serves as the benchmark in determining the services and features TRS providers must offer to consumers.¹⁰ TRS is now available nationwide, twenty-four hours a day, seven days a week, so that persons with hearing and speech disabilities can access the telephone system to make calls to, and receive calls from, voice telephone users. In some circumstances, TRS equipment also permits persons with hearing disabilities to communicate directly with each other (*i.e.*, peer-to-peer or deaf-to-deaf calls).

3. When Congress enacted section 225, relay calls were placed using a text telephone device (TTY) connected to the Public Switched Telephone Network (PSTN). Since then, the Commission has recognized new forms of TRS, including Internet-based forms of TRS such as VRS,¹¹ IP Relay,¹² and IP CTS.¹³

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address any issues relating to IP CTS, if appropriate, in a separate order because IP CTS raises distinct technical and regulatory issues. *See infra* note 13.

⁶ *See Telecommunications Relay Services And Speech-to-Speech Services For Individuals With Hearing And Speech Disabilities, E911 Requirements For IP-Enabled Service Providers*, CG Docket No. 03-123, WC Docket No. 05-196, Report and Order, 23 FCC Rcd 5255 (Mar. 19, 2008) (*Interim Emergency Call Handling Order*).

⁷ Pub. L. No. 101-336, § 401, 104 Stat. 327, 336-69 (1990); 47 U.S.C. § 225.

⁸ 47 U.S.C. § 225(b)(1).

⁹ 47 U.S.C. § 225(a)(3); *see also* 47 C.F.R. § 64.604.

¹⁰ *See* 47 C.F.R. § 64.604.

¹¹ *See 2000 TRS Order*, 15 FCC Rcd at 5152-54, paras. 21-27.

¹² *See IP Relay Declaratory Ruling & Second FNPRM*, 17 FCC Rcd at 7783-84, paras. 10-14.

¹³ Captioned telephone service is a form of TRS generally used by someone who can speak and who has some residual hearing. A special telephone displays the text of what the other party is saying, so that the user can simultaneously listen to what is said over the telephone (to the extent possible) and read captions of what the other person is saying. *See Telecommunications Relay Services, and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CC Docket No. 98-67, Declaratory Ruling, 18 FCC Rcd 16121 (Aug. 1, 2003) (*CapTel Declaratory Ruling*). With IP CTS, the connection carrying the captions between the relay provider and the user is via the Internet, rather than the PSTN. *See Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities; Internet-based Captioned Telephone Service*, CG Docket No. 03-123, Declaratory Ruling, 22 FCC Rcd 379, 388, para. 22 (Jan. 11, 2007) (*IP CTS Declaratory Ruling*).

4. *Uniform Numbering for Internet-Based TRS.* Currently, VRS users do not have a reliable or consistent means by which others can identify or reach them. In contrast to the voice telephone network, Internet-based relay services are not linked to a uniform numbering scheme. Instead of a ten-digit telephone number, VRS users are typically assigned a “dynamic” IP address.¹⁴ As a consequence, it is more difficult to place a relay call to a VRS user, as compared to placing a call to a voice telephone user, because the calling party must ascertain the VRS user’s current IP address each time he or she wishes to place a call to that individual.¹⁵

5. To simplify the process of contacting VRS users, some VRS providers have created their own database of “proxy” or “alias” numbers that link to the IP addresses of their customers, even if a particular customer’s IP address is dynamic.¹⁶ While these numbers often resemble telephone numbers, which makes it easier for Internet-based relay users to give their “number” to hearing persons who may wish to call them via VRS, these databases are maintained by the service provider and generally are not shared with other service providers.¹⁷ Therefore, a person desiring to call an Internet-based relay user via the user’s proxy number can only use the services of the VRS provider that generates the number,¹⁸ an outcome that is in tension with the *Interoperability Declaratory Ruling and FNPRM*.¹⁹

6. IP Relay users frequently are assigned other types of unique identifiers, such as an instant-message service and screen-name.²⁰ Such unique identifiers also make it more difficult to place a relay call to an IP Relay user, as compared to placing a call to a voice telephone user, if for no other reason than they cannot be dialed over a telephone.²¹

7. Recognizing the need for a uniform numbering system for Internet-based TRS, the Commission previously sought comment in May 2006 on the “feasibility of establishing a single global

¹⁴ Because there are more Internet users than possible IP addresses, Internet service providers generally assign a temporary “dynamic” IP address to a computer. Dynamic addressing generally assigns an available address to the computer each time a connection is established. See Ray Horak, *Communications Systems and Networks* (3rd ed.) at 489 (2002). By contrast, a “static” IP address is a number assigned to a computer by an Internet service provider as a permanent Internet address.

¹⁵ See *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing Disabilities*, CG Docket No. 03-123, Declaratory Ruling and Further Notice of Proposed Rulemaking, 21 FCC Rcd 5442, 5447, para. 12 (May 9, 2006) (*Interoperability Declaratory Ruling and FNPRM*); see also *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CG Docket No. 03-123, Notice of Proposed Rulemaking, 20 FCC Rcd 19476, 19481–82, paras. 13–14 (Nov. 30, 2005) (*VRS/IP Relay 911 NPRM*).

¹⁶ *Interoperability Declaratory Ruling and FNPRM*, 21 FCC Rcd at 5459, para. 46.

¹⁷ *Id.*

¹⁸ *Id.* at 5459–60, para. 46.

¹⁹ In the *Interoperability Declaratory Ruling and FNPRM*, we ruled that a VRS provider that restricts the use of its equipment or service so that a VRS user cannot use such equipment or service to place or receive a call through a competing VRS provider is ineligible for compensation from the Interstate TRS Fund. See *id.* at 5454, para. 29. Such a practice, we concluded, violates section 225(a)(3)’s functional equivalency mandate and is inimical to the public interest. *Id.* at 5454–56, paras. 30–36.

²⁰ See Sorenson Refresh Comments at 8–9 (noting that “IP Relay addresses are often associated with a screen name, or some identifier other than an IP address”).

²¹ When IP Relay is made available through a simple web interface, see, e.g., <http://www.sprintip.com>, users are even more difficult to reach given that the user may not need to provide any identifying information (such as a user login name) before initiating a call.

database of proxy numbers for VRS users that would be available to all service providers, so that a hearing person can call a VRS user through any VRS provider, and without first having to ascertain the VRS user's current IP address.²² The Commission requested comment on technical and economic issues relating to the establishment of a numbering scheme, including the "need for standard protocols so that the database system can work with all VRS equipment and services."²³ The Commission also sought comment on "whether there are aspects of proxy numbers that are dependent on functionalities outside of a database, such as functionalities in the user's equipment," as well as any other technical issues commenters may have deemed relevant to the Commission's inquiry.²⁴

8. In addition to seeking comment on the use of proxy numbers, the Commission sought comment on assigning Internet-based TRS users uniform and static end-point numbers linked to the NANP so that the numbers will remain constant and thereby provide Internet-based TRS users a reliable and consistent means by which they may receive calls from non-TRS users.²⁵ The Commission also sought comment on the maintenance and operation of such a database, and on the role of the Commission in creating and maintaining the database.²⁶

9. In the March 19, 2008 *Interim Emergency Call Handling Order*, the Commission announced its intention to adopt a ten-digit numbering plan for Internet-based TRS in a future Commission order.²⁷ That same day, and to ensure that the record reflects new technical, economic, and administrative developments related to the implementation of a ten-digit numbering system, the Commission's Consumer & Governmental Affairs Bureau ("Bureau") issued the *Numbering PN*, inviting interested parties to refresh the record on issues relating to the assignment and administration of ten-digit numbering for Internet-based TRS users.²⁸ The Bureau also sought to refresh the record on other issues related to numbering, including number resource conservation,²⁹ and the application of the Commission's anti-"slamming" rules,³⁰ CPNI rules,³¹ and local number portability (LNP) rules³² to Internet-based TRS

²² *Interoperability Declaratory Ruling and FNPRM*, 21 FCC Rcd at 5460, para. 47.

²³ *Id.*

²⁴ *Id.*

²⁵ *Id.* at 5460, para. 48.

²⁶ *Id.* at 5460, paras. 49–50. Eight comments and five reply comments were filed with the Commission in response to the *Interoperability Declaratory Ruling and FNPRM*. Commenters generally supported the establishment of a uniform numbering system linked to the NANP for Internet-based TRS users. See, e.g., Comments of AT&T Inc., July 17, 2006 at 2–4; Comments of CSD, July 17, 2006, at 1–9; Comments of Hands On, July 17, 2006 at 1–15; Comments of Sorenson, July 17, 2006 at 2–7; Comments of Sprint Nextel Corporation, July 17, 2006 at 2–4; Comments of Verizon, July 17, 2006 at 1–5.

²⁷ See *Interim Emergency Call Handling Order*, 23 FCC Rcd at 5257, para. 1.

²⁸ See *id.* at 5257, 5269, paras. 1, 24; see also *Consumer & Governmental Affairs Bureau Seeks to Refresh Record on Assigning Internet Protocol (IP)-Based Telecommunications Relay Service (TRS) Users Ten-Digit Telephone Numbers Linked to North American Numbering Plan (NANP) and Related Issues*, CG Docket No. 03-123, Public Notice, 23 FCC Rcd 4727 (Mar. 19, 2008) (*Numbering PN*) (seeking to refresh the record on numbering issues for Internet-based TRS users).

²⁹ See, e.g., *Interoperability Declaratory Ruling and FNPRM*: Comments of Communication Service for the Deaf, Inc. in CG Docket No. 03-123 at 6–8 (July 17, 2006) (addressing numbering-related slamming and LNP issues); see also Ex Parte of Hands On Video Relay Services, Inc. in CG Docket No. 03-123 at 2 (Nov. 7, 2007) (asserting that number conservation efforts should not hinder the deployment of a numbering system for Internet-based TRS).

³⁰ See 47 U.S.C. § 258(a); 47 C.F.R. § 64.1120 (slamming restrictions).

providers.³³

10. In the *Interim Emergency Call Handling Order*, the Commission also announced a plan to hold a Stakeholder Workshop addressing ten-digit numbering for Internet-based TRS at the conclusion of the comment cycle established by the *Numbering PN*.³⁴ The Stakeholder Workshop, which was attended by consumers, providers, vendors, and other interested parties, included presentations and discussions of three principal proposals for implementing a ten-digit numbering system for Internet-based TRS, as filed in the record by NeuStar, Inc., CSDVRS LLC, and AT&T/GoAmerica, Inc.³⁵ The Stakeholder Workshop, which was webcast and archived for later viewing,³⁶ also included consumers' perspectives on each of the proposals, and a discussion of technical and operational issues posed by each proposal.³⁷

11. *Emergency Call Handling Requirements for Internet-Based TRS*. Under the Commission's emergency call handling requirements, a traditional, TTY-based TRS provider must use a system for incoming emergency calls that "automatically and immediately transfers the caller to an appropriate Public Safety Answering Point."³⁸ Through a series of orders between 2001 and 2008, the Commission examined the applicability of these requirements to Internet-based TRS and, in particular, assessed the technological challenges associated with determining the geographic location of Internet-based TRS calls.³⁹ The Commission recognized that because these services use the Internet, rather than a

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³¹ See 47 U.S.C. § 222; 47 C.F.R. § 64.2001 *et seq.* (CPNI requirements).

³² See 47 U.S.C. § 153(30) (defining number portability); 47 C.F.R. § 52.20 *et seq.* (LNP requirements).

³³ *Numbering PN*, 23 FCC Rcd at 4727-28. Ten comments and twelve reply comments were filed by providers and other entities in response to the *Numbering PN*. More than four hundred individual comments were also filed. Commenters overwhelmingly support Commission adoption of a system for assigning ten-digit telephone numbers to Internet-based TRS users.

³⁴ See *Interim Emergency Call Handling Order*, 23 FCC Rcd at 5257, 5269, paras. 1, 24; see also *FCC to Hold Workshop on Solutions for Implementing Ten-Digit Telephone Numbering for Internet-Based Telecommunications Relay Services on April 29, 2008*, News Release (April 4, 2008); *FCC Releases Agenda for April 29, 2008, Stakeholder Workshop on Ten-Digit Numbering Solutions for Internet-Based Telecommunications Relay Services*, News Release (April 23, 2008) (*April 23, 2008, Stakeholder Workshop News Release*).

³⁵ See *infra* paras. 47-72; see generally *April 23, 2008, Stakeholder Workshop News Release*.

³⁶ See *April 29, 2008 Workshop on Ten-Digit Numbering Plan for Internet-Based TRS*, available at <http://www.fcc.gov/realaudio/mt042908.ram> (Workshop Webcast).

³⁷ See *April 23, 2008, Stakeholder Workshop News Release* (attaching workshop agenda); see also http://www.fcc.gov/cgb/dro/workshop_attendees.html (list of workshop participants).

³⁸ See 47 C.F.R. § 64.604(a)(4). We note that, as amended by the *Interim Emergency Call Handling Order*, section 64.604(a)(4) now applies exclusively to TTY-based TRS providers. The emergency call handling requirements applicable to Internet-based TRS providers are now set forth in section 64.605 of the Commission's rules. See *Interim Emergency Call Handling Order*, 23 FCC Rcd at 5275-76, Appendix B.

³⁹ See generally *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CC Docket No. 98-67, Order, 17 FCC Rcd 157 (Dec. 31, 2001) (*2001 VRS Waiver Order*) (waiving emergency call handling requirement for VRS for two years); *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CC Docket No. 98-67, Order, 18 FCC Rcd 26309 (Dec. 19, 2003) (extending VRS waiver through June 30, 2004); *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CC Docket Nos. 90-571 & 98-67, CG Docket No. 03-123, Report and Order, Order on Reconsideration, and Further Notice of Proposed Rulemaking, 19 FCC Rcd 12475, 12520-21, paras. 111-12 (June 30, 2004) (*2004 TRS Report & Order*) (extending VRS waiver through December 31, 2005); *Telecommunications Relay Services and Speech-to-Speech Services for* (continued....)

telephone and the PSTN, for the link of the call between the calling party and the relay provider, the relay provider does not receive the automatic number identification (ANI) of the calling party.⁴⁰ As a result, providers experience difficulty identifying the caller's location and determining the appropriate public safety answering point (PSAP) to call to respond to an emergency.⁴¹ Nonetheless, the Commission has consistently emphasized the importance of access to emergency services for relay users.⁴² The Commission therefore determined that a temporary waiver was needed to the extent that these technological challenges hindered providers' ability to "immediately and automatically" place the outbound leg of an emergency call to an appropriate PSAP, as required by the Commission's emergency call handling rule.⁴³

12. In the *Interim Emergency Call Handling Order*, the Commission terminated the temporary waivers of the emergency call handling rule, effective May 21, 2008, for VRS, IP Relay, and IP CTS in light of the "present imperative to provide Internet-based TRS users a reliable means of accessing emergency services."⁴⁴ The Commission required Internet-based TRS providers to "accept and handle emergency calls" and to access, either directly or via a third party, a commercially available database that will allow the provider to determine an appropriate PSAP, designated statewide default answering point, or appropriate local emergency authority that corresponds to the caller's location, and to relay the call to that entity.⁴⁵ The Commission also adopted several interim emergency call handling requirements for Internet-based relay services, finding that these measures are needed to facilitate access to emergency services for consumers of Internet-based relay services, pending the adoption of a longer term solution.⁴⁶ In particular, the Commission required Internet-based TRS providers to: (1) implement a

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Individuals with Hearing and Speech Disabilities, CG Docket No. 03-123, Order, 21 FCC Rcd 14554 (Dec. 15, 2006) (extending VRS waiver through December 31, 2007) (*2006 VRS Waiver Order*); *IP Relay Declaratory Ruling & Second FNPRM*, 17 FCC Rcd at 7789, para. 30 (waiving emergency call handling requirement for IP Relay for one year); *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CC Docket No. 98-67, Order on Reconsideration, 18 FCC Rcd. 4761, 4766, para. 12, and 4770-71, para. 28 (Mar. 14, 2003) (*IP Relay Reconsideration Order*) (extending IP Relay waiver through December 31, 2007); *2007 IP CTS Declaratory Ruling*, 22 FCC Rcd at 391-92, para. 30 & n.100 (waiving emergency call handling requirement for IP CTS until 911 access for the Internet-based forms of TRS is resolved); see generally *2004 TRS Report & Order*, 19 FCC Rcd at 12594, Appendix E (chart summarizing VRS and IP Relay waivers); *Interim Emergency Call Handling Order*, 23 FCC Rcd at 5255, para. 1 (terminating VRS, IP Relay, and IP CTS waivers, effective May 21, 2008, and adopting interim emergency call handling requirements for Internet-based TRS providers).

⁴⁰ See, e.g., *2004 TRS Report & Order*, 19 FCC Rcd at 12522, para. 117.

⁴¹ *Id.*; see also *IP Relay Declaratory Ruling & Second FNPRM*, 17 FCC Rcd at 7789, para. 30 (recognizing that, without ANI of the calling party, IP Relay provider petitioner could not provide PSAP with information regarding the calling party's location).

⁴² See, e.g., *VRS/IP Relay 911 NPRM*, 20 FCC Rcd at 19477, para. 1 (emphasizing the need for a solution providing direct, automatic access to emergency services via VRS and IP Relay); *IP Relay Declaratory Ruling & Second FNPRM*, 17 FCC Rcd at 7789, para. 30 (urging IP Relay providers to develop a method by which they can automatically provide critical emergency information to an appropriate PSAP).

⁴³ See, e.g., *2001 VRS Waiver Order*, 17 FCC Rcd at 162, para. 13 (granting temporary waiver of emergency call handling requirement for VRS providers).

⁴⁴ See *Interim Emergency Call Handling Order*, 23 FCC Rcd at 5265-66, para. 16.

⁴⁵ See *id.*; 47 C.F.R. § 64.605 (setting forth additional operational standards applicable to Internet-based TRS).

⁴⁶ See *Interim Emergency Call Handling Order*, 23 FCC Rcd at 5265-66, 5275-76, para. 16, Appendix B (adopting new section 64.605, setting forth emergency call handling requirements applicable to Internet-based TRS; prior section 64.605 redesignated as section 64.606).

system that ensures that providers answer an incoming emergency call before other non-emergency calls; (2) request, at the beginning of every emergency call, the caller's name and location information; (3) deliver to the PSAP, designated statewide default answering point, or appropriate local emergency authority, at the outset of the outbound leg of the call, at a minimum, the name of the relay user and location of the emergency, as well as the name of the relay provider, the CA's callback number, and the CA's identification number, thereby enabling the PSAP, designated statewide default answering point, or appropriate local emergency authority to re-establish contact with the CA in the event the call is disconnected; and (4) in the event one or both legs of the call are disconnected (*i.e.*, either the call between the TRS user and the CA, or the outbound voice telephone call between the CA and the PSAP, designated statewide default answering point, or appropriate local emergency authority), immediately re-establish contact with the TRS user and/or the appropriate PSAP, designated statewide default answering point, or appropriate local emergency authority and resume handling the call, when feasible.⁴⁷

13. In the *Interim Emergency Call Handling Order*, the Commission also announced its intention to adopt in a forthcoming Commission order a Registered Location process, similar to that adopted by the Commission in the interconnected VoIP context.⁴⁸ The Commission stated that a Registered Location procedure constitutes "[a] critical component of an E911 solution for Internet-based TRS providers," so that a provider may promptly determine an appropriate PSAP, designated statewide default answering point, or appropriate local emergency authority to call to respond to an emergency.⁴⁹

III. DISCUSSION

A. Jurisdiction

14. We conclude that we have the authority to adopt a system for assigning persons using Internet-based TRS ten-digit telephone numbers linked to the NANP pursuant to sections 225 and 251 of the Act. As set forth below, section 225 requires that functionally equivalent TRS be available nationwide, and directs the Commission to adopt regulations to govern the provision and compensation of TRS. Section 251 grants the Commission authority to oversee numbering administration in the United States.

15. *Section 225.* The Commission's authority to adopt a system for the assignment and administration of ten-digit telephone numbers for Internet-based TRS derives from section 225 of the Act.⁵⁰ That section instructs the Commission to adopt regulations implementing section 225, including regulations "establish[ing] functional requirements, guidelines, and operations procedures for [TRS],"⁵¹ as well as mandatory "minimum standards" governing the provision of TRS.⁵² Section 225 also requires TRS to offer service "in a manner that is functionally equivalent to the ability of an individual who does

⁴⁷ See *Interim Emergency Call Handling Order*, 23 FCC Rcd at 5268, para. 21.

⁴⁸ See *id.* at 5268, para. 22 (citing *IP-Enabled Services; E911 Requirements for IP-Enabled Service Providers*, WC Docket Nos. 04-36, 05-196, First Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 10245, 10271, para. 46 (June 3, 2005) (*VoIP 911 Order*) (describing Registered Location requirement for interconnected voice over Internet Protocol (VoIP) providers)); see also 47 C.F.R. § 9.3 (defining "Registered Location" as the "most recent information obtained by an interconnected VoIP service provider that identifies the physical location of an end user").

⁴⁹ See *Interim Emergency Call Handling Order*, 23 FCC Rcd at 5268, para. 22.

⁵⁰ 47 U.S.C. § 225.

⁵¹ 47 U.S.C. § 225(d)(1)(A).

⁵² 47 U.S.C. § 225(d)(1)(B).

not have a [hearing or speech disability] to communicate using voice communication services.”⁵³ Throughout its orders, the Commission has relied upon the functional equivalency standard in determining the services and features TRS providers, including Internet-based TRS providers, must offer to consumers.⁵⁴ Further, section 225 requires the Commission to ensure that TRS is available “to the extent possible and in the most efficient manner” to persons with hearing and speech disabilities.⁵⁵

16. The voice telephone system is predicated on the assignment of ten-digit numbers to consumers, and the ability of any telephone user to reach a consumer by dialing that person’s particular number. Further, because location and other identifying information is attached to each number, consumers can dial 911 and reach emergency services that can automatically determine the caller’s location to respond to the emergency. The same holds true for consumers of the PSTN-based TRS. Voice telephone users can call these consumers via TRS if they know the consumer’s ten-digit telephone number, which they provide to the CA when making the relay call. These TRS consumers can also contact emergency services by either dialing 911 directly or by calling a TRS provider; in either case, the caller’s location information will automatically be passed to the emergency personnel. This is presently not the case, however, with respect to consumers using the Internet-based forms of TRS. Voice telephone users can call an Internet-based TRS user only if the caller knows the TRS user’s current Internet address (or a proxy therefor), and the Internet-based TRS user cannot call emergency services and have location information automatically transmitted.

17. We therefore find that the Commission’s rulemaking authority provided in section 225(d) encompasses the authority to adopt a system for assigning Internet-based TRS users ten-digit telephone numbers linked to the NANP to ensure that such consumers have access to functionally equivalent relay service, including the ability to receive calls from voice telephone users and to make emergency calls that will automatically route to an appropriate PSAP. We also find that the Commission has jurisdiction in this context under the authority granted by section 225(a) to ensure that TRS is available to the extent possible and in the most efficient manner to individuals with hearing or speech disabilities.

⁵³ 47 U.S.C. § 225(a)(3), (c).

⁵⁴ See, e.g., *2000 TRS Order*, 15 FCC Rcd at 5152, para. 23 (recognition of VRS as a form of TRS will make relay services functionally equivalent to voice telephone service for persons whose first language is American Sign Language); see generally *2004 TRS Report & Order*, 19 FCC Rcd at 12547–48, para. 189 (the requirement of functional equivalency is met by offering service in compliance with the TRS mandatory minimum standards, and these standards will change as technology changes).

⁵⁵ 47 U.S.C. § 225(b)(1).

18. *Section 251.* We also find that we have authority to establish a ten-digit numbering regime for Internet-based TRS and to extend the LNP requirements to Internet-based TRS providers and their numbering partners, based upon the authority that Congress granted this Commission under section 251(e)(1).⁵⁶ In section 251(e)(1) of the Act, Congress expressly assigned to the Commission exclusive jurisdiction over that portion of the NANP that pertains to the United States.⁵⁷ The Commission therefore has “authority to set policy with respect to all facets of numbering administration in the United States.”⁵⁸ Our plenary authority over NANP numbering resources gives us authority to require Internet-based TRS providers to provide NANP telephone numbers to their users.⁵⁹ We exercise our authority under the Act to ensure that Internet-based TRS users obtain and use NANP telephone numbers in accordance with the ten-digit numbering plan adopted herein.⁶⁰ To the extent that an Internet-based TRS provider provides services that offer its customers NANP telephone numbers, both the Internet-based TRS provider and the telecommunications carrier that secures the numbering resource from the numbering administrator subject themselves to the Commission’s plenary authority under section 251(e)(1) with respect to those numbers.

19. In addition, we have authority under section 251(b)(2) to impose LNP obligations on the local exchange carrier (LEC) numbering partners of Internet-based TRS providers.⁶¹ Section 251(b)(2) states that all LECs have a “duty to provide, to the extent technically feasible, number portability in accordance with the requirements prescribed by the Commission.”⁶² The Commission has long held that it has “authority to require that number portability be implemented ‘to the extent technically feasible’ and that our authority under section 251(b)(2) encompasses all forms of number portability.”⁶³ In addition,

⁵⁶ Cf. *VoIP 911 Order*, 20 FCC Rcd at 10265, para. 33 (relying on the Commission’s plenary authority over U.S. NANP numbers, particularly Congress’s direction to use that authority regarding 911, to impose 911 obligations on interconnected VoIP providers, given interconnected VoIP providers’ use of NANP numbers to provide service). A numbering partner is a carrier that is eligible to receive numbers directly from the NANPA or the Pooling Administrator (PA) and makes such numbers available to its customers through commercial arrangements. See *infra* para. 31.

⁵⁷ See 47 U.S.C. § 251(e)(1) (providing that “[t]he Commission shall have exclusive jurisdiction over those portions of the North American Numbering Plan that pertain to the United States”).

⁵⁸ *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996; Interconnection Between Local Exchange Carriers and Commercial Mobile Radio Service Providers; Area Code Relief Plan for Dallas and Houston, Ordered by the Public Utility Commission of Texas; Administration of the North American Numbering Plan; Proposed 708 Relief Plan and 630 Numbering Plan Area Code by Ameritech-Illinois*, CC Docket Nos. 96-98, 95-185, 92-237, NSD File No. 96-8, IAD File No. 94-102, Second Report and Order and Memorandum Opinion and Order, 11 FCC Rcd 19392, 19512, para. 271 (Aug. 8, 1996) (explaining that by retaining exclusive jurisdiction over numbering policy the Commission preserves its ability to act flexibly and expeditiously).

⁵⁹ See 47 U.S.C. § 251(e)(1).

⁶⁰ Cf. *Telephone Number Requirements for IP Enabled Services Providers; Local Number Portability Porting Interval and Validation Requirements; IP-Enabled Services; Telephone Number Portability; CTIA Petitions for Declaratory Ruling on Wireline-Wireless Porting Issues; Final Regulatory Flexibility Analysis; Number Resource Optimization*, WC Docket Nos. 07-243, 07-244, 04-36; CC Docket Nos. 95-116, 99-200, Report and Order, Declaratory Ruling, Order on Remand, and Notice of Proposed Rulemaking, 22 FCC Rcd 19531, 19544 para. 23 (Nov. 8, 2007) (exercising authority under the Act to ensure that end users maintain an interest in their NANP numbers through the porting process) (*VoIP LNP Order*).

⁶¹ See 47 U.S.C. § 251(b)(2); cf. *VoIP LNP Order*, 22 FCC Rcd at 19543-44, para. 23.

⁶² *VoIP LNP Order*, 22 FCC Rcd at 19543-44, para. 23.

⁶³ *Telephone Number Portability*, CC Docket No. 95-116, Fourth Memorandum Opinion and Order on Reconsideration, 14 FCC Rcd 16459, 16466-67, para. 12 (July 16, 1999).

we believe we have a separate additional source of authority under Title I of the Act to impose LNP obligations on Internet-based TRS providers.⁶⁴

B. Adoption of a Uniform Ten-Digit Telephone Numbering System for Internet-based TRS

20. As stated above, in the *Interim Emergency Call Handling Order*, we committed to adopting a system for assigning users of Internet-based TRS ten-digit telephone numbers linked to the NANP by second quarter 2008, with implementation to be completed no later than December 31, 2008.⁶⁵ To that end, we issued the *Numbering PN*,⁶⁶ and received numerous responses from industry, consumer groups, and concerned individuals.⁶⁷

21. The record reflects a general consensus that Internet-based forms of TRS should have a uniform numbering system to facilitate interoperability between deaf and hearing users and to support comprehensive E911 service.⁶⁸ There is further consensus that the numbering system should utilize numbers from the NANP.⁶⁹ Use of NANP telephone numbers will allow Internet-based TRS users to reach and be reached by both hearing users of the PSTN and other Internet-based TRS users by doing something most Americans take for granted – dialing a ten-digit phone number. Such a system also will help to ensure that persons using Internet-based TRS can promptly access functionally equivalent 911 service.⁷⁰

22. We find that utilization of NANP numbers will best achieve the goal of making Internet-

⁶⁴ Cf. *VoIP LNP Order*, 22 FCC Rcd at 19544–47, paras. 24–27 (explaining that the Commission has ancillary authority over interconnected VoIP services, and that its assertion of subject matter jurisdiction is reasonably ancillary to the effective performance of the Commission’s various responsibilities). See generally *National Cable & Telecomms. Ass’n v. Brand X Internet Services*, 545 U.S. 967, 976 (2005) (“[T]he Commission has jurisdiction to impose additional regulatory obligations under its Title I ancillary jurisdiction to regulate interstate and foreign communications, see §§ [47 U.S.C.] 151–161.”).

⁶⁵ *Interim Emergency Call Handling Order*, 23 FCC Rcd at 5257, para. 1.

⁶⁶ See *Numbering PN*, 23 FCC Rcd 4727.

⁶⁷ A list of commenters is attached at Appendix A. Numerous individuals also filed brief comments. See *supra* note 33.

⁶⁸ See, e.g., AT&T Refresh Comments at 1; CSDVRS Refresh Comments at 2; TDI Coalition Refresh Comments at 2; Nebraska PSC Refresh Comments at 2–3; Sorenson Refresh Comments at 2; Sprint Nextel Refresh Comments at 1; AG Bell Refresh Reply Comments at 1; AAPD Refresh Reply Comments at 2; Sonny Refresh Reply Comments at 1.

⁶⁹ See, e.g., CSDVRS Refresh Comments at 2 (“CSD and CSDVRS enthusiastically support the establishment of a global, uniform ten-digit telephone numbering system for all Internet-based video and text relay users.”); Sorenson Refresh Comments at 2 (“[T]he Commission should adopt a uniform numbering system for Internet-based relay services that is integrated with the numbering system used for traditional voice services.”); GoAmerica Refresh Comments at 6 (“[T]he Commission should mandate that Internet based TRS providers implement a functionally equivalent numbering system for consumers based on NANP numbers”); TDI Coalition Refresh Comments at 2 (“Establishing a numbering system linked to the NANP for IP-based relay services is a critical component in achieving functional equivalency for IP based TRS services”).

⁷⁰ See NENA Refresh Reply Comments at 1 (noting the “critical need for telephone number availability for 9-1-1 purposes for the deaf and hard of hearing community”); Dash Refresh Comments at 2 (“10-digit NANP numbering is a requirement if relay providers are going to successfully interconnect to the existing emergency network.”); CSDVRS Refresh Comments at 5 (“Personal ten-digit local telephone numbers will enable relay users to have integrated E9-1-1 support”); TDI Coalition Refresh Comments at 3.

based TRS functionally equivalent to traditional circuit switched telephony, and will provide Internet-based TRS users a reliable and consistent means by which they may receive calls from voice telephone users. We therefore require, consistent with the procedures set forth below, Internet-based TRS providers to assign Internet-based TRS users NANP telephone numbers.⁷¹ We further require Internet-based TRS providers to stop issuing "proxy" or "alias" numbers no later than December 31, 2008.⁷²

23. Full connectivity between Internet-based TRS and the PSTN cannot be achieved simply by assigning telephone numbers to Internet-based TRS users. The networks upon which the Internet portion of Internet-based TRS operates require IP addresses rather than NANP telephone numbers for routing. In order to allow calls to be appropriately routed and completed, a mechanism must be created for mapping the telephone numbers assigned to Internet-based TRS users to the IP addresses (or other appropriate endpoint identifiers) used by Internet-based TRS.

24. In light of the foregoing, the Commission must specify two major items in order to establish a uniform ten-digit numbering system for Internet-based forms of TRS: (1) a means for NANP numbers to be assigned to Internet-based TRS users and (2) a central numbering directory mechanism that maps each NANP telephone number assigned to an Internet-based TRS user to the appropriate Internet address.⁷³

1. Number Acquisition and Assignment

25. We find that it is most expedient and consistent with our numbering policies for Internet-based TRS users to obtain NANP telephone numbers directly from their Internet-based TRS providers. Internet-based TRS providers may obtain such numbers either: (1) directly from the NANPA or the PA if they are certificated as carriers and otherwise meet the criteria for obtaining numbers; or (2) through commercial arrangements with carriers (*i.e.*, numbering partners). These are precisely the methods of obtaining numbers that are available to providers of interconnected VoIP service and their customers. Finally, Internet-based TRS users and providers of Internet-based TRS will enjoy the full benefits of LNP.

a. Assigning Telephone Numbers to End Users

26. As an initial matter, we determine how Internet-based TRS users are to obtain, or be assigned, telephone numbers. The record reflects that there are a variety of processes which could be employed, which fall generally into three categories: (1) "remote call forwarding," a process whereby Internet-based TRS users obtain service, including a NANP telephone number, from a LEC and forward

⁷¹ To the extent that TRS consumers are concerned that they will receive unsolicited telemarketing calls, we note that TRS users may register their numbers with the National Do-Not-Call Registry. See *Rules and Regulations Implementing the Telephone Consumer Protection Act of 1991*, CG Docket No. 02-278, Report and Order, 18 FCC Rcd 14014 (July 3, 2003) (*2003 TCPA Order*). Consumers can add their telephone numbers to the Registry by registering online at www.donotcall.gov.

⁷² We acknowledge that certain carriers and Internet-based TRS providers offer, and have issued or assigned to Internet-based TRS providers, numbers that are used to provide toll-free services using non-geographic area codes such as 800, 888, 877 and 866 (toll free numbers). See, e.g., <http://www.csdvrs.com> (last visited June 10, 2008). This *Order* does not preclude an Internet-based TRS user from choosing to keep a toll free number previously obtained from an Internet-based TRS provider in lieu of obtaining a geographically appropriate number. We seek comment in the *Further Notice* regarding issues involved in the use of toll free numbers by Internet-based TRS users, including whether Internet-based TRS users should be subject to a fee for use of toll free numbers as are hearing users. See *infra* Section IV.4.

⁷³ *Numbering for Internet-based Relay Services*, Report of Alliance for Telecommunication Industry Solutions (ATIS), Washington, D.C., at 9, para. 3.3.1 (Dec. 19, 2007) (ATIS Report).

the number to the appropriate Internet-based TRS provider;⁷⁴ (2) Internet-based TRS users obtain NANP telephone numbers directly from a neutral third-party administrator;⁷⁵ or (3) Internet-based TRS users obtain numbers from Internet-based TRS providers.⁷⁶

27. There is little support for the general use of remote call forwarding in the record,⁷⁷ and we find it unreasonable to require Internet-based TRS users to subscribe to local exchange service merely to obtain NANP telephone numbers that can be ported to or otherwise utilized by Internet-based TRS providers,⁷⁸ especially in light of the fact that subscribers to interconnected VoIP service can obtain numbers directly from their service providers. The record does demonstrate some support for Internet-based TRS users obtaining NANP telephone numbers from a neutral third party administrator.⁷⁹ Such an approach has, however, several disadvantages. First, requiring Internet-based TRS users to obtain numbers from a non-service provider is not functionally equivalent to the processes used by voice telephone users and subscribers to interconnected VoIP services. In addition, granting a neutral third-party administrator direct access to numbering resources would not be consistent with the Commission's rules,⁸⁰ and although the neutral third party could obtain numbering resources from numbering partners, it would not be economically efficient to inject a middleman into a process that can be implemented directly by Internet-based TRS providers and numbering partners.⁸¹ Finally, utilization of a neutral third party for number distribution would add unnecessary cost and complexity to the implementation process.

28. We find that the best process for Internet-based TRS users to obtain telephone numbers is directly from their Internet-based TRS providers. The record generally supports this approach.⁸² Such a

⁷⁴ ATIS Report at 13, para. 4.1.4.

⁷⁵ ATIS Report at 13, para 4.1.5.

⁷⁶ ATIS Report at 13, paras. 4.1.1–4.1.3, 4.1.6.

⁷⁷ See Letter from Julie Miron, Executive Director, CAC, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 03-123 at 6 (filed Apr. 28, 2008) (urging that Internet-based TRS users have “primary responsibility for procuring numbers from their LEC”). NeuStar notes that remote call forwarding can be utilized in geographic areas where carriers are unwilling or unable to provide geographically appropriate numbering resources to interconnected VoIP providers and Internet-based TRS providers. See NeuStar Refresh Comments, Attach. at 5. As discussed in greater detail below, we agree that the use of remote call forwarding may be an appropriate temporary “workaround” in those limited cases where numbers are not available to Internet-based TRS providers through a numbering partner. See *infra* para. 41.

⁷⁸ See AT&T Refresh Comments at 2 (“Because VRS users only need to use NANP numbers for inbound service (calls from hearing individuals), there is no need for the VRS user to purchase a local exchange access line to their premise which is more expensive. . . . The resulting cost for the VRS user is significantly less than the \$20 or more per number when purchased individually in conjunction with an access line from the LEC.”); GoAmerica Refresh Comments at 18 (criticizing proposal to require Internet-based TRS users to obtain numbers through LECs).

⁷⁹ See CSDVRS Refresh Comments at 6 (“A single neutral party, rather than VRS providers, should have primary responsibility for assigning and distributing ten-digit local numbers directly to relay users.”); TDI Coalition Refresh Comments at 4 (supporting both third-party administrator and TRS provider options); AG Bell Refresh Reply Comments at 1; AAPD Refresh Reply Comments at 3; Sonny Refresh Reply Comments at 2.

⁸⁰ See *infra* para. 30.

⁸¹ See *infra* para. 33.

⁸² See AT&T Refresh Comments at 2–3 (abandoning proposal that Internet-based TRS users obtain numbers from LECs in favor of proposal that users obtain NANP numbers directly from Internet-based TRS providers, who can obtain numbers the same way VoIP providers obtain numbers, and can make the numbers available to users at a much cheaper price); Dash Refresh Comments at 6 (“We would suggest that relay providers will likely obtain (continued....)”).

process is functionally equivalent to the process by which subscribers to interconnected VoIP, CMRS, and local exchange service obtain numbers.⁸³ Indeed, even proponents of the neutral third-party process note that some consumers view their Internet-based TRS provider as if it were a telephone company and therefore expect that they should obtain numbering resources directly from the Internet-based TRS provider.⁸⁴

b. Internet-based TRS Providers' Acquisition of Numbering Resources

29. In light of our decision to have Internet-based TRS users obtain numbers directly from Internet-based TRS providers, we must determine how Internet-based TRS providers are to obtain access to numbering resources. The record reflects three methods: (1) directly from the NANPA or the PA,⁸⁵ (2) from a neutral third-party administrator established for the purpose,⁸⁶ or (3) from numbering partners through commercial agreements.⁸⁷

30. Only carriers, absent a Commission waiver,⁸⁸ may obtain numbering resources directly from the NANPA or the PA. Section 52.15(g)(2) of the Commission's rules limits access to the NANP numbering resources to those applicants that are (1) "authorized to provide service in the area for which the numbering resources are being requested" and (2) "[are] or will be capable of providing service within sixty (60) days of the numbering resources activation date."⁸⁹ Allowing only carriers to have direct access to NANP numbering resources helps to ensure that the numbers are used efficiently and to avoid number exhaust and also provides some control over who may access numbering databases and personnel.⁹⁰ Thus, to the extent that a provider of Internet-based TRS is licensed or certificated as a carrier under the Act and relevant state law (as appropriate), it may obtain numbering resources directly from the NANPA or PA.⁹¹

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numbers in a manner similar to smaller VoIP service providers, including through resellers and other avenues outside of direct assignment from an ILEC or even CLEC carriers."); GoAmerica Refresh Comments at 17 ("The most efficient methodology would be for relay providers to make numbers available for consumers."); NeuStar Refresh Comments at 4 (proposing that Internet-based TRS providers obtain NANP numbers as VoIP providers do); Sorenson Refresh Comments at 19 ("Providers will have to assign users with NANP numbers"); TRS Advisory Council Refresh Comments at 1.

⁸³ See GoAmerica Refresh Comments at 17 ("Deaf and hard of hearing users should have the same functionally equivalent choice of obtaining their NANP numbers from the equivalent of voice telecommunications providers—relay service providers."); see also AT&T Refresh Comments at 2–3; Dash Refresh Comments at 6; NeuStar Refresh Comments at 4; NeuStar Refresh Reply Comments at 21 ("[S]tandards compliant devices should be able to use [a method] to dial anyone just as a hearing person can.").

⁸⁴ CSDVRS Refresh Reply Comments at 5 ("Some consumers who use IP relay or VRS perceive their relay providers to be the equivalent of a telephone company that distributes telephone numbers to voice users.").

⁸⁵ ATIS Report at 13, 19, paras. 4.1.1, 4.1.6, 5.1.1.

⁸⁶ *Id.* at 13, 20–21, paras. 4.1.3, 4.1.5, 5.1.3.

⁸⁷ *Id.* at 13, 19–20, paras. 4.1.2, 5.1.2.

⁸⁸ See *Administration of the North American Numbering Plan*, CC Docket No. 99-200, Order, 20 FCC Rcd 2957, 2959, 2961–62, paras. 4, 9 (Feb. 1, 2005) (*SBCIS Waiver Order*). We reiterate the Commission's existing rule of general applicability regarding eligibility for direct access to numbering resources. See *VoIP LNP Order*, 22 FCC Rcd at 19542, para. 20; *Numbering Resource Optimization*, CC Docket No. 99-200, Report and Order and Further Notice of Proposed Rulemaking, 15 FCC Rcd 7574, 7615, para. 97 (Mar. 31, 2000) (*NRO First Report and Order*) (stating that carriers must provide evidence demonstrating that they are licensed and/or certified to provide service prior to accessing numbering resources). We note that petitions seeking waivers similar to the relief granted in the *SBCIS Waiver Order* are pending. See, e.g., *Wireline Competition Bureau Seeks Comment on Qwest* (continued....)

31. We recognize, however, that many, if not all, providers of Internet-based TRS will not be licensed or certificated as carriers. Internet-based TRS providers that have not obtained a license or certificate of public convenience and necessity from the relevant states or otherwise are not eligible to receive numbers directly from the NANPA or PA may make numbers available to their customers through commercial arrangements with carriers (*i.e.*, numbering partners). This method has proven successful in the context of interconnected VoIP,⁹² is consistent with our numbering rules,⁹³ and is cost effective.⁹⁴ TRS providers can easily obtain numbers from certified carriers the same way interconnected

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Communications Corporation Petition for Limited Waiver of Section 52.15(g)(2)(i) of the Commission's Rules Regarding Access to Numbering Resources, CC Docket No. 99-200, Public Notice, 20 FCC Rcd 8765 (May 4, 2005). This Order does not in any way prejudice the outcome of the Commission's consideration of those petitions.

⁸⁹ 47 C.F.R. § 52.15(g)(2).

⁹⁰ *NRO First Report and Order*, 15 FCC Rcd at 7615, para. 97.

⁹¹ See 47 C.F.R. § 52.15(g)(2)(i); see also *VoIP LNP Order*, 22 FCC Rcd at 19542, para. 20; *NRO First Report and Order*, 15 FCC Rcd at 7615, para. 97.

⁹² See, *e.g.*, NeuStar Refresh Comments, Attach. at 4 ("This model works well in the VoIP environment and would be the same mechanism for providing telephone numbers to relay providers."); see also NeuStar Refresh Comments at 4 ("This is exactly the same manner through which most VoIP providers obtain and distribute telephone numbers today."); AT&T Refresh Comments at 2; Sorenson Refresh Comments at 6-7. We disagree with the Nebraska PSC that assigning Internet-based TRS users numbers from a pool of numbers associated with an Internet-based TRS provider could be potentially discriminatory as the only individuals receiving such numbers would be part of the deaf and hard-of-hearing community. Nebraska PSC Refresh Comments at 4. Internet-based TRS service providers will not draw numbers from a pool dedicated to Internet-based TRS, but instead will obtain geographically appropriate numbers from numbering partners that are indistinguishable from numbers provided to subscribers of interconnected VoIP service or traditional local exchange service. The general availability of numbers to Internet-based TRS providers through numbering partners likewise addresses the concern that Internet-based TRS users will be limited to "those providers with numbering resources in the rate center where they reside." *Id.* To the extent a geographically appropriate number is not available to Internet-based TRS providers, one of the "workarounds" discussed in paragraph 41 may be utilized until numbers become available, through numbering partners or number portability. Finally, we disagree with the Nebraska PSC that allowing Internet-based TRS providers to distribute numbers obtained from numbering partners will contribute to numbering exhaust. Internet-based TRS providers, which generally are not certificated as carriers, will have neither the ability nor the incentive to obtain numbers in thousand blocks for each rate center in which they have a Registered Internet-based TRS User. Rather, those providers will be able to obtain as many or as few numbers as they need for each rate center from their numbering partners. See NeuStar Refresh Comments, Attach. at 4-5; GoAmerica Refresh Comments at 21 ("[R]elay providers will only have to obtain what [numbers] they need, or in worse case carry a minimal inventory far below the current minimum allocation obtained through NANPA (of 1,000 blocks or larger).").

⁹³ Our rules require that only carriers that are licensed or certified as carriers under the Act may receive numbering resources. 47 C.F.R. § 52.15(g)(2)(i) (applicants for numbering resources must be "authorized to provide service in the area for which numbering resources are being requested").

⁹⁴ See AT&T Refresh Reply Comments at 2 ("VRS providers can easily obtain [NANP] numbers from voice service providers . . . and then provide such numbers to relay users at a low price (generally \$1 or less per line per month)."); NeuStar Refresh Comments at 13 (noting that the rate for assigning a number from a carrier to an Internet-based TRS provider is "from \$0.75 to \$0.95 per transaction"). We disagree with CSDVRS's argument that allowing Internet-based TRS providers to obtain and distribute NANP numbers "link[s] numbers and equipment" and is "plainly anti-competitive." CSDVRS Refresh Reply Comments at 13. First, CSDVRS complains that a consumer who obtains a number from one VRS provider is "more than likely" to use that same provider to make outgoing calls. *Id.* at 13 n.12. But even CSDVRS admits that under our interoperability rules that very consumer is "free . . . to make outgoing calls on any provider's network." *Id.* Second, its complaint that VRS providers who can obtain and distribute numbers will "enjoy a substantial competitive advantage," *id.* at 14, is largely mooted by our (continued....)

VoIP providers obtain numbers today.

32. In any case, Internet-based TRS providers and their numbering partners shall be entitled to obtain and use numbering resources only to the extent they comply with the requirements of this *Order*. We also remind all parties that telephone numbers are a public resource, not private property.⁹⁵ They may not be bought or sold.⁹⁶ They may, however, be provided as part of a package of services that includes, for example, interconnection, connectivity, or 911 service.

33. In light of record support for, and the demonstrated success of interconnected VoIP providers in, obtaining NANP telephone numbers from carriers, we decline to appoint a neutral third party to obtain numbers from the NANPA or from numbering partners for distribution to providers of Internet-based TRS or Internet-based TRS users.⁹⁷ Allowing a third-party administrator direct access to numbering resources is not consistent with general Commission policy – as discussed above, absent a waiver, our rules allow only carriers direct access to NANP numbering resources.⁹⁸ Further, the record reflects that a third-party administrator would add “another layer of personnel, process, and cost in the number procurement process.”⁹⁹

c. Local Number Portability

34. The record is clear that the ability to port numbers (1) from one Internet-based TRS provider to another, and (2) between Internet-based TRS providers and other entities subject to LNP (such as carriers and interconnected VoIP providers) is a priority in any numbering plan for Internet-based TRS.¹⁰⁰ Accordingly, we find that Internet-based TRS providers and their numbering partners are subject

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extension of local number portability to numbers obtained from VRS providers. *See infra* paras. 34–36; CSDVRS Refresh Reply Comments at 14 n.14 (admitting that “users will always be able to port their numbers to [other] providers”); *see also* NeuStar Refresh Reply Comments at 13–14 (explaining that “[s]tandards based equipment” can smooth an Internet-based TRS user’s transition from one provider to another).

⁹⁵ *See Toll Free Service Access Codes*, CC Docket No. 95-155, Fourth Report and Order and Memorandum Opinion and Order, 13 FCC Rcd 9058, 9061, para. 6 n.14 (Mar. 31, 1998); *Toll Free Service Access Codes*, CC Docket No. 95-155, Notice of Proposed Rulemaking, 10 FCC Rcd 13692, 13702, para. 36 (Oct. 5, 1995) (*Toll Free Access Notice*); *Administration of the North American Numbering Plan*, CC Docket No. 92-237, Report and Order, 11 FCC Rcd 2588, 2591, para. 4 (July 13, 1995) (“These numbers are a public resource, and are not the property of the carriers.”); *see also, e.g., In re StarNet, Inc.*, 355 F.3d 634, 637 (7th Cir. 2004).

⁹⁶ *Cf. Toll Free Access Notice*, 10 FCC Rcd at 13697, para. 16 n.41 (“800 Numbers are not to be treated as commodities which can be bought or sold, and no individual or entity is granted a proprietary interest in any 800 number assigned.”).

⁹⁷ *See* CSDVRS Refresh Comments at 13 (“The ONS will acquire [NANP telephone] number blocks from wholesale carriers . . . and the major local exchange carriers . . .”).

⁹⁸ *See supra* para. 30.

⁹⁹ ATIS Report at 22; *see also* GoAmerica Refresh Comments at 17–18 (“[T]he third party issuer would have less incentive than relay providers to efficiently distribute numbers and thus should not be the only option available to obtain numbers. . . . [C]reating a third party to manage network connectivity between the PSTN and the various providers would create a potential single point of failure in the networks that could disrupt all calls from hearing to deaf users in the event of a problem.”); NeuStar Refresh Reply Comments at 7 (noting that a third-party system is inefficient because it would “force[] Relay Providers to query the [central] database for every call” rather than just a “subset of calls”).

¹⁰⁰ *See, e.g.,* Dash Refresh Comments at 5 (“Full number portability is required by the concept of functional equivalency as set forth in Section 225 of the Communications Act of 1934, as amended.”); NeuStar Refresh Comments, Attach. at 5; GoAmerica Refresh Comments at 15–16; TRS Advisory Counsel Refresh Comments at 2; Sorenson Refresh Comments at 18; TDI Coalition Refresh Comments at 5; AAPD Refresh Reply Comments at 2; (continued....)

to the same porting obligations, with the sole exception of contributing to meet shared numbering administration costs and LNP costs, as the Commission set forth in the *VoIP LNP Order*.¹⁰¹

35. As discussed above, the plenary numbering authority that Congress granted this Commission under section 251(e)(1) provides ample authority to extend the LNP requirements to Internet-based TRS providers and their numbering partners.¹⁰² In addition, we believe we have a separate additional source of authority under Title I of the Act to impose LNP obligations on Internet-based TRS providers.¹⁰³ Therefore, by this *Order*, we expand the scope of our LNP rules to include Internet-based TRS providers, so that the full array of obligations relating to the porting of numbers from one service provider to another service provider are applicable when an Internet-based TRS user wishes to port a number, regardless of whether the service providers involved are carriers, interconnected VoIP providers, or Internet-based TRS providers. However, for the sake of clarity, we note that as applied to an Internet-based TRS provider, the rules adopted in the *VoIP LNP Order* require that an Internet-based TRS provider and its numbering partner must facilitate a user's port request to or from another Internet-based TRS provider. This means the Internet-based TRS provider has an affirmative legal obligation to take all steps necessary to initiate or allow a port-in or port-out itself or through its numbering partner on behalf of the Internet-based TRS user, subject to a valid port request, without unreasonable delay or unreasonable procedures that have the effect of delaying or denying porting of the number. Moreover Internet-based TRS providers and their numbering partners may not enter into agreements that would prohibit or unreasonably delay an Internet-based TRS user from porting between Internet-based TRS providers and will be subject to Commission enforcement action for any such violation of the Act and the Commission's LNP rules.¹⁰⁴

36. To the extent that an Internet-based TRS provider is licensed or certificated as a carrier, that carrier is eligible to obtain numbering resources directly from the NANPA, subject to all relevant rules and procedures applicable to carriers, including LNP requirements. Under these circumstances, the Internet-based TRS provider would not have a numbering partner, and would thus be solely responsible for compliance with the Commission rules at issue here.¹⁰⁵

37. *Numbering Administration Costs.* Section 251(e)(2) provides that "[t]he cost of establishing telecommunications numbering administration arrangements and number portability shall be borne by all telecommunications carriers on a competitively neutral basis as determined by the Commission."¹⁰⁶ Carriers and interconnected VoIP providers that benefit from LNP generally are

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see also GoAmerica Refresh Reply Comments at 3 ("[A]ll commenters agree that numbers assigned under the Internet-based numbering solution must be portable so that consumers may freely choose their Internet-based TRS default providers.").

¹⁰¹ See *VoIP LNP Order*, 22 FCC Rcd at 19548-51, paras. 30-37. This order, which became effective shortly before the Nebraska PSC filed its comments, addresses the Nebraska PSC's concerns regarding the number of LNP complaints resulting from the indirect assignment of numbers to interconnected VoIP providers and, now, Internet-based TRS providers. See 73 FR 9463 (Feb. 21, 2008) (announcing effective date of March 24, 2008).

¹⁰² See *supra* paras. 18-19.

¹⁰³ See *supra* note 64.

¹⁰⁴ See, e.g., *Wireless Number Portability Order*, 18 FCC Rcd at 20975, para. 11 (interpreting the Act's number portability definition to mean that "customers must be able to change carriers while keeping their telephone number as easily as they may change carriers without taking their telephone number with them").

¹⁰⁵ See *VoIP LNP Order*, 22 FCC Rcd at 19542, para. 20 n.62.

¹⁰⁶ 47 U.S.C. § 251(e)(2).

required to contribute to meet shared LNP costs.¹⁰⁷

38. We decline to extend to Internet-based TRS providers the obligation to contribute to meet shared LNP costs at this time. Unlike other providers that benefit from LNP, providers of Internet-based TRS are not permitted to recover their costs from their end users. Rather, Internet-based TRS providers are compensated by the Interstate TRS Fund for the costs of providing relay service. Money in the Interstate TRS Fund is collected from various providers of telecommunications and related services – many of which already contribute to meet shared LNP costs.¹⁰⁸ It makes little sense to require Internet-based TRS providers to contribute to defray shared LNP costs covered by the same providers that ultimately provide the money Internet-based TRS providers will use to make such contributions.

39. *Implementation.* Since the ultimate responsibility for numbers obtained from the numbering administrator is unchanged by this *Order*, there is no need to detail a separate implementation schedule for porting to or from a provider of Internet-based TRS. Thus, consistent with the implementation schedule set forth below, Internet-based TRS LNP must be fully implemented no later than December 31, 2008.¹⁰⁹

40. *Enforcement.* If any service provider experiences problems with another service provider when attempting to port a consumer's number, or if a consumer experiences problems with porting, we expect the provider or consumer to file a complaint with the Commission.¹¹⁰ We take very seriously our obligation to effectuate number portability and our oversight of numbering resources. The Commission will act expeditiously to ensure that consumers have the option to switch providers, subject to our LNP rules, without the loss of their telephone numbers or service.

d. Geographically Appropriate Numbers

41. Voice telephone users that subscribe to local exchange service are provided with a geographically appropriate telephone number by virtue of the architecture of the PSTN. In the vast majority of cases, subscribers to interconnected VoIP services likewise have the ability to obtain a geographically appropriate NANP telephone number.¹¹¹ In the interest of functional equivalency, and consistent with the recommendations of the ATIS Report, we find that Internet-based TRS users should be assigned geographically appropriate NANP numbers, as happens today for hearing users. We note that there may be unusual and limited circumstances in which an Internet-based TRS provider may not be able to obtain a geographically appropriate number for a particular end user.¹¹² While we do not expect this to be a common occurrence, Internet-based TRS providers may temporarily employ suitable workarounds in

¹⁰⁷ See *VoIP LNP Order*, 22 FCC Rcd at 19551–52, paras. 38–39.

¹⁰⁸ See generally *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CG Docket No. 03-123, Report and Order and Declaratory Ruling, 22 FCC Rcd 20140 (Nov. 19, 2007) (*2007 TRS Rate Methodology Order*); *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CG Docket No. 03-123, Order, 22 FCC Rcd 11706, 11706–08, paras. 1–4 (CGB June 29, 2007) (*2007 Bureau TRS Rate Order*).

¹⁰⁹ See *infra* Section III.G.

¹¹⁰ 47 U.S.C. § 208 (authorizing complaints against common carriers); 47 C.F.R. § 1.1 (authorizing interested parties to petition the Commission to open, among other things, an enforcement proceeding).

¹¹¹ See GoAmerica Refresh Reply Comments at 4 (“In most locations throughout the U.S., TRS providers will have no problem obtaining local telephone number[s] for use by their users.”); Sorenson Refresh Comments at 7 (noting that the VoIP “approach to numbering acquisition . . . has proven successful”).

¹¹² NeuStar Refresh Comments, Attach. at 5 (“[W]holesale carriers do not serve every rate center and therefore will not have truly local numbers available for every location.”).

such circumstances, such as the assignment of a number which is reasonably close to the Internet-based TRS user's rate center, or the use of remote call forwarding.¹¹³ Such workarounds may be employed only until a geographically appropriate number becomes available, unless the end user chooses to retain the originally assigned number.¹¹⁴

e. "Default Provider" Registration

42. Every provider of Internet-based TRS is required to provide Internet-based TRS users with the capability to register with that Internet-based TRS provider as a "default provider" and provide or port for that user a NANP telephone number.¹¹⁵ Such registration is required: (1) to allow the Internet-based TRS provider to take steps to associate the Internet-based TRS user's telephone number with their IP address to allow for the routing and completion of calls;¹¹⁶ (2) to facilitate the provision of 911 service;¹¹⁷ and (3) to facilitate the implementation of appropriate network security measures.¹¹⁸

43. The Internet-based TRS provider with which an Internet-based TRS user has registered will serve as the Internet-based TRS user's "default provider."¹¹⁹ For all Internet-based TRS users, all inbound and outbound calls will, by default, be routed through the default provider. Such a default provider arrangement is functionally equivalent to services provided on the PSTN and via interconnected VoIP. For example, voice telephone users that subscribe to a particular carrier for long distance service will make all of their long distance calls on that carrier's network unless they choose to "dial around" to an alternative long distance provider. Likewise, and in keeping with the *Interoperability Declaratory Ruling and FNPRM*, calls made to and from an Internet-based TRS user will be handled by the default provider, unless the calling Internet-based TRS user specifically "dials around" in order to utilize an alternative provider.¹²⁰ Individuals calling an Internet-based TRS user likewise will have the option of "dialing around" an Internet-based TRS user's default provider in order to utilize the services of a

¹¹³ *Id.* We find such workarounds to be a more flexible solution than, and thus preferable to, mandating that any "telephone provider of last resort" be required to provide numbers to Internet-based TRS providers. See GoAmerica Refresh Reply Comments at 4.

¹¹⁴ Because the use of remote call forwarding may inhibit some functionally equivalent services such as Caller ID, NeuStar Refresh Comments, Attach. at 5, we emphasize that such a workaround must be only a temporary solution until the Internet-based TRS provider can obtain a geographically appropriate number for the Internet-based TRS user by ordinary means.

¹¹⁵ The deaf and hard-of-hearing community generally agrees that registration for these purposes is appropriate. See, e.g., TDI Coalition Refresh Comments at 5-6.

¹¹⁶ See *infra* Section III.B.2.a.

¹¹⁷ See *infra* paras. 80-81; see also *Interim Emergency Call Handling Order*, 23 FCC Rcd at 5269, para. 23 ("We believe that user registration is critical to achieving the goal of providing location identification to first responders in the context of emergency calls placed over Internet-based TRS").

¹¹⁸ For example, with registration Internet-based TRS providers can limit access to their databases to only Registered Internet-based TRS Users and other Internet-based TRS providers, reducing the exposure of a provider's databases to slamming, hacking, or other abuses. See NeuStar Refresh Comments, Attach. at 9; see also *infra* Section III.E.

¹¹⁹ For the purposes of this *Order*, an Internet-based TRS provider's "Registered Internet-based TRS Users" are those users that have registered with that particular provider as their default provider.

¹²⁰ Although VRS and IP Relay providers will be the default providers for Internet-based TRS users under this *Order*, nothing in this *Order* detracts from a TRS provider's interoperability obligations. See generally *Interoperability Declaratory Ruling and FNPRM*, 21 FCC Rcd 5442.

different TRS provider. Consistent with the LNP discussion above, an Internet-based TRS user may select and register with a new default provider at any time and have his or her number ported to that provider.

44. As of December 31, 2008, Internet-based TRS providers must, prior to the initiation of service for an individual that has not previously utilized Internet-based TRS, register that new Internet-based TRS user, provide that user with a ten-digit NANP telephone number, obtain that user's Registered Location, and fulfill all other requirements set forth in this *Order* that pertain to Registered Internet-based TRS Users. We find that allowing Internet-based TRS users to opt-in to or, for that matter, opt-out of registration, which is required for the provision of E911 service, is fundamentally inconsistent with our obligation to "encourage and support efforts by States to deploy comprehensive end-to-end emergency communications infrastructure and programs."¹²¹

45. Our numbering plan must be implemented such that ten-digit numbers are available to Internet-based TRS users no later than December 31, 2008.¹²² We recognize, however, that every existing Internet-based TRS user will not be able to register with a default provider on that day. We therefore recognize that we must adopt a registration period for the existing base of Internet-based TRS users to migrate to the new numbering plan. In the *Further Notice*, we seek comment on the registration period timeframe.¹²³

2. Centralized Numbering Directory Mechanism

46. The record demonstrates consensus that a centralized numbering directory mechanism be employed to support calls between Internet-based TRS users using different providers of Internet-based TRS and between Internet-based TRS users and callers using the PSTN.¹²⁴ Specifically, consensus exists that there is need for a central database mechanism that maps the NANP telephone numbers assigned to Internet-based TRS users to an appropriate Internet address.¹²⁵ Commenters agree that this centralized numbering directory mechanism should be administered by a neutral third party.¹²⁶

¹²¹ Wireless Communications and Public Safety Act of 1999, Pub. L. No. 106-81, 113 Stat. 1286, § 3(b) (1999); *see also VoIP 911 Order*, 20 FCC Rcd at 10271-72, para. 47.

¹²² *See supra* para. 1.

¹²³ *See infra* Section IV.2.

¹²⁴ *See, e.g.*, CSDVRS Refresh Comments at 2 ("CSD and CSDVRS enthusiastically support the establishment of a global, uniform ten-digit telephone numbering system for all Internet-based video and text relay users."); Dash Refresh Comments at 4 ("There appears to be no dispute within the relay industry that a central numbering database is a base requirement for a 10-digit NANP numbering plan."); Nebraska PSC Refresh Comments at 6 (fully supporting a centralized database managed by a third party); TDI Coalition Refresh Comments at 2 (stating that "[e]stablishing a numbering system linked to the NANP for IP-based relay services is a critical component in achieving functional equivalency"); AT&T Refresh Comments at 1; AG Bell Refresh Reply Comments at 1 (supporting the establishment of a single and open numbering directory); AAPD Refresh Reply Comments at 2; Sonny Refresh Reply Comments at 1. We note that the record contains a number of different possible labels or descriptions of the centralized numbering directory mechanism. *See, e.g.*, ATIS Report at 8, para. 3.3 ("Central Routing Database"); CSDVRS Refresh Comments at 8-9 ("TN database" or "TN information database"); Dash Refresh Comments at 4 ("Central Numbering Database"); NeuStar Refresh Comments, Attach. at 6 ("central database").

¹²⁵ *See, e.g.*, ATIS Report at 9, para. 3.3.4; Dash Refresh Comments at 3 (supporting using NANP numbers to obtain users' IP addresses); AT&T Refresh Comments at 1; Sprint Nextel Refresh Comments at 4.

¹²⁶ *See, e.g.*, Sprint Refresh Comments at 5 ("There is no dispute that a central database managed by a neutral third party must be deployed to support interoperability by ensuring that calls are correctly routed to the Relay provider (continued....)")

47. The efforts of the end-user community, industry, and the Commission, have not, *however, been sufficient to reach consensus on how such a centralized numbering directory mechanism should be implemented.* Indeed, the record currently reflects three proposals (Industry Proposals) for implementing a centralized numbering directory mechanism: NeuStar's Telephone Numbers for Relay Users (TRU); AT&T, GoAmerica, Hands On, and Dash's (Joint Proposal) Open Relay Database (ORD); and CSDVRS's One Number System (ONS).¹²⁷

48. The core of each of the Industry Proposals is quite similar. Each proposes to establish a database into which routing information is provisioned,¹²⁸ and to make that routing information available via a query system built on industry-standard domain naming system (DNS) and/or telephone number mapping (ENUM) technology.¹²⁹ The differences amongst the Industry Proposals, at the highest level, can be narrowed to three critical, but severable, issues: (1) the nature of the information contained in the central database; (2) the means by which the central database is provisioned with that information; and (3) the choice of who will be authorized to access the central database.¹³⁰ Further, the Industry Proposals are not "all or nothing," but consist of severable design components.¹³¹

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chosen by the user of an Internet-based Relay service."); GoAmerica Refresh Comments at 12 (supporting the use of a neutral third-party database administrator), CSDVRS Refresh Comments at 9; NeuStar Refresh Comments at 15; Sorenson Refresh Comments at 17; TDI Coalition Refresh Comments at 3.

¹²⁷ See NeuStar Refresh Comments, Attach.; Letter from Richard L. Fruchterman, III, Public Policy and Regulatory Counsel, NeuStar, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 03-123, Attach. (filed May 9, 2008); AT&T Refresh Comments at 1-3; Dash Refresh Comments at 7-9; GoAmerica Refresh Comments at 21-25; Letter from Toni R. Acton, Director, AT&T, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 03-123, Attach. (filed Apr. 17, 2008) (AT&T *Ex Parte*); CSDVRS Refresh Comments at 10-32.

¹²⁸ See Letter from Richard L. Fruchterman, III, Public Policy and Regulatory Counsel, NeuStar, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 03-123, Attach. (filed May 20, 2008) (discussing how NPAC database fits into NeuStar's TRU plan) (NeuStar TRU Supplement); Letter from Kelby Brick, Vice President of Legal and Strategic Policy, GoAmerica, Inc., to Marlene H. Dortch, Secretary, FCC, CG Docket No. 03-123, Attach. (filed May 21, 2008) (GoAmerica ORD Supplement) (discussing ORD database); Letter from George L. Lyon, Jr., Counsel, GoAmerica, Inc., to Marlene H. Dortch, Secretary, FCC, CG Docket No. 03-123, Attach. (filed May 28, 2008) (GoAmerica ORD Responsive Supplement) (comparing the three databases); Letter from Karen Peltz Strauss, Legal Consultant, CSDVRS, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 03-123, Attach. at 5 (filed May 5, 2008) (CSDVRS Workshop Deck) (discussing ONS database). The NPAC is the local number portability database of record in the United States and Canada and is administered by NeuStar. Today it associates ported and pooled NANP telephone numbers with PSTN routing and other information.

¹²⁹ See NeuStar TRU Supplement at 2; GoAmerica ORD Supplement at 31, 38; GoAmerica ORD Responsive Supplement at 1-2; CSDVRS Workshop Deck at 6; *see also* NeuStar Refresh Reply Comments at 7 n.20 ("All three proposals contemplate that DNS in general, and ENUM in specific, will be used to query the database"). As described in the ATIS report, DNS is the industry standard name for the Internet resource translation mechanism. Various capabilities built on DNS, *e.g.*, delegation, Telephone Number Mapping (ENUM), and Dynamic DNS (DDNS), provide a range of methods to support relay interoperability. DDNS is an existing DNS capability used to link domain names to IP addresses when those addresses are dynamically rather than statically assigned. *See* ATIS Report at 17, para. 4.2.2.1.

¹³⁰ One additional, and unique, aspect of the CSDVRS ONS plan is its proposal to have a neutral third party establish a full "ONS VoIP Network" to "support the termination of . . . calls at the designated relay provider." *See* CSDVRS Refresh Comments at 14.

¹³¹ *See* Letter from Toni R. Acton, Director, AT&T Services Inc., to Marlene H. Dortch, Secretary, FCC, CG Docket No. 03-123, Attach. at 13 (filed May 5, 2008) (AT&T Workshop Deck); Letter from Richard L. Fruchterman, III, Public Policy and Regulatory Counsel, NeuStar, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 03-123, Attach. at 4 (filed May 9, 2008) (NeuStar Workshop Deck); Letter from Michael B. Fingerhut, Director of (continued....)

49. As discussed in greater detail below, there are benefits and drawbacks to each of the Industry Proposals. We find that no single Industry Proposal represents the best implementation of a centralized numbering directory mechanism, but instead find that a combination of different elements of the Industry Proposals will best serve the interests of Internet-based TRS users, Internet-based TRS providers, and the general public. Specifically, and as discussed in greater detail below, we find that the best centralized numbering directory mechanism shall: (1) be provisioned with Uniform Resource Identifiers (URIs) that contain, *inter alia*, end-user IP addresses for VRS and domain names and user names for IP Relay; (2) be provisioned by Internet-based TRS providers on behalf of their Registered Internet-based TRS Users; and (3) limit central database access to Internet-based TRS providers. We further find that industry-standard DNS and ENUM technology is well-suited for implementing and querying the database.

a. Information to be Provisioned to the Central Database

50. The primary purpose of the central database will be to map each Internet-based TRS user's NANP telephone number to his or her end device. This can be accomplished by: (1) provisioning the database with each Internet-based TRS user's IP address (either alone or as part of a URI),¹³² or (2) provisioning the database with URIs that contain domain names and user names – such as an instant-message service and screen-name – that can be subsequently resolved to reach the user's end device.¹³³

51. As an initial matter, we note that the central database must contain domain names and user names for IP Relay.¹³⁴ Domain names and user names are required for this form of Internet-based TRS in light of the wide array of IP-based text communication applications, services, and user identifiers that can be used for the leg of an IP Relay call between the Internet-based TRS user and a CA.¹³⁵ We further note that for a VRS user the central database must contain information other than a user's IP address (e.g., a device-specific protocol identifier and, in some instances, a non-standard port number)

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Governmental Affairs, Sprint, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 03-123, Attach. at 1 (filed May 19, 2008) (calling the numbering and database management issues "separable design decisions").

¹³² At its simplest, a URI specifies both how (the protocol) and where (the address) to access a resource on the Internet. Thus a URI that contains an IP address might take the form "H323:128.000.000.001," in which "H323" specifies the protocol to be used and "128.000.000.001" specifies the resource's address. URIs that contain domain names and user names might similarly take the forms "H323:2025551212@siprelay.com" or "IM:IMUser@aol.com." The Joint Proposal and NeuStar's TRU contemplate that ENUM will be utilized to query the central database, and ENUM returns URIs in the form of Naming Authority Pointers (NAPTR). See NeuStar Refresh Reply Comments at 7 n.20. To the extent that URIs provisioned to the central database must contain information other than IP addresses or domain names and user names (e.g., a protocol identifier, port number, etc.) in order to allow a call to be completed as discussed in this *Order*, we require that such information also be contained in URIs provisioned to the central database.

¹³³ Domain names and user names have the advantage of being relatively static (*i.e.*, they do not need to be updated frequently); although additional DNS queries are required to resolve a domain name and user name to an IP address. IP addresses do not require additional DNS queries to complete routing, but they can be dynamic, changing frequently. We note that a single database can accommodate both URIs that contain IP addresses and other URIs that contain domain names and user names.

¹³⁴ ATIS Report at 16, 17, paras. 4.2.1.2, 4.2.2.2; Sorenson Refresh Comments at 8–9; NeuStar Workshop Deck at 6.

¹³⁵ See Sorenson Refresh Comments at 8–9 ("Because IP Relay addresses are often associated with a screen name, or some identifier other than an IP address . . . association of a number with an IP address will not work for IP Relay. . . . IP addresses . . . do not provide information about the protocols or systems employed by the end-user's device; and they do not work for users with multiple devices served by a single IP address.").

and that this information can be included in a URI.¹³⁶ We therefore decline to adopt the ONS recommendation that the central database be provisioned only with IP addresses,¹³⁷ and instead require that URIs be provisioned to the central database.

52. With respect to VRS, URIs containing domain names and user names or URIs containing IP addresses can be provisioned to the central database and used by a querying party to properly route a call to a VRS user.¹³⁸ The choice of what information is contained in URIs provisioned to the central database will determine the signaling path required to establish the call.¹³⁹ In particular, the choice will directly impact how signaling is effectuated for calls between VRS users that have selected different default providers.¹⁴⁰

53. Based on the record before us, we find that the central database should be provisioned with URIs containing IP addresses for VRS users. Provisioning URIs containing IP addresses to the central database will result in a simplified, and more efficient, call setup process by eliminating the need to query an Internet-based TRS user's default provider before completing every call.¹⁴¹ Further, the use of a domain name in the URI normally would create a dependency on the global Domain Name System and thereby introduce those additional security vulnerability issues associated with the global DNS. Finally, eliminating the terminating party's default provider from the call flow also improves Internet-based TRS user privacy by limiting the number of Internet-based TRS providers that have access to call signaling data,¹⁴² and limits any ability the terminating party's default provider might have to block or otherwise degrade calls initiated through a competitor.¹⁴³

54. *Registered Location information.* CSDVRS's ONS plan contemplates that the central database serve as a repository of Registered Location information used to deliver E911 service.¹⁴⁴ As discussed below in Section III.C, we decline to require that Internet-based TRS providers utilize a single provider of 911 related services. We likewise decline to require that Registered Location information be stored in the central database.¹⁴⁵ There is nothing in the record to indicate that providers of 911 service

¹³⁶ See *supra* note 132.

¹³⁷ See CSDVRS Refresh Comments at 21-22; CSDVRS Workshop Deck at 3.

¹³⁸ See ATIS Report at 15-17, paras. 4.2.1.1, 4.2.2.1.

¹³⁹ See generally ATIS Report, Appendix 1.

¹⁴⁰ Compare, e.g., Sorenson Refresh Comments at 10-11 & Attach. 2 at 3 (explaining that, if the database's URIs contain domain names and user names and two Internet-based TRS users have different service providers, a call would need to be routed from the calling user, to one service provider, to the database, back to the first service provider, then to the other service provider and to the receiving user), with ATIS Report at 17, para. 4.2.2.1 (explaining that, if the database's URIs contain IP addresses, callers could avoid the step of querying the receiving user's service provider). Similar call routing occurs when a PSTN user calls an Internet-based TRS user and chooses not to utilize the terminating party's default provider. See NeuStar TRU Supplement at 1, 3; Sorenson Refresh Comments at 10-11 & Attach. 2 at 3; AT&T Workshop Deck at 4.

¹⁴¹ See, e.g., AT&T Workshop Deck at 4; ATIS Report, Appendix 1; Sprint Refresh Comments at 6; see also *supra* note 140.

¹⁴² Cf. CSDVRS Refresh Comments at 18-19.

¹⁴³ See AT&T Refresh Reply Comments at 5.

¹⁴⁴ See *infra* paras. 80-81 (discussing Registered Location requirement).

¹⁴⁵ We anticipate that, consistent with the practice of interconnected VoIP service providers, Registered Location data will be maintained by Internet-based TRS providers and/or their 911 service provider partners. See *infra* paras. 80-81.

utilize a uniform format for storing registered location information, and requiring that Registered Location information be stored in the central database potentially could interfere with Internet-based TRS providers' ability to leverage existing 911 technologies. Further, the record does not indicate a pressing need for Internet-based TRS providers to have access to the Registered Location information of Internet-based TRS users other than their Registered Internet-based TRS Users.¹⁴⁶

b. Means for Provisioning the Central Database

55. The Industry Proposals set forth three alternatives for populating and updating the central database. Under CSDVRS's ONS, Internet-based TRS users would directly provision information to the central database. Specifically, CSDVRS's ONS would require installation, at the user location, of a "One Number Service Module" (ONSM), which would periodically update the central database with the Internet-based TRS user's IP address.¹⁴⁷ We reject the CSDVRS ONS proposal. Such an approach poses significant security risks that are not present under other provisioning systems, as discussed below. In addition, we have significant questions about the feasibility and cost of ensuring that every Internet-based TRS user has installed new software or hardware on their TRS customer premises equipment (CPE) or home networks prior to December 31, 2008.¹⁴⁸

56. Both NeuStar's TRU and the Joint Proposal would require Internet-based TRS providers to provision routing information to the central database. NeuStar's TRU proposes that the necessary routing information be provisioned to a new field created in the NPAC, which generally would require Internet-based TRS providers to provision information into the NPAC through their numbering partners.¹⁴⁹ The Joint Proposal's ORD, by contrast would have Internet-based TRS providers provision Internet-based TRS user routing information directly to the central database.¹⁵⁰

57. NeuStar's TRU and the Joint Proposal's ORD share certain benefits as compared to CSDVRS's ONS.¹⁵¹ Neither NeuStar's TRU nor the Joint Proposal's ORD require modifications to end user equipment or networks. Both proposals also reduce central database security risks by limiting access to a limited set of registered entities.¹⁵² We further find, however, that the benefits of utilizing a provisioning method like that discussed in the Joint Proposal's ORD outweigh those of using the NPAC.

58. First, we note that NeuStar argues that its TRU proposal is best suited to ensuring the

¹⁴⁶ See *infra* para. 86.

¹⁴⁷ CSDVRS Refresh Comments at 21–24. CSDVRS states that the ONSM would consist of a "software application on a PC connected to the same LAN as the videophone" or a piece of hardware installed on the Internet-based TRS user's home network. *Id.* at 22.

¹⁴⁸ See, e.g., AT&T Refresh Comments at 3 ("[S]ome existing customer equipment does not have the capability to automatically update the national database").

¹⁴⁹ ATIS Report at 16, para. 4.2.1.1; NeuStar Workshop Deck at 10. Only carriers, or entities operating under a letter of agency from a carrier, are permitted to update the NPAC. NeuStar Workshop Deck at 19.

¹⁵⁰ GoAmerica Refresh Comments at 15; AT&T Refresh Comments at 3 ("[T]he most feasible way to update the national database is to require VRS providers to do so upon receipt of updated IP addresses from their customers").

¹⁵¹ See Letter from Walter Magnussen, President, ACUTA: The Association of Communication Technology Professionals in Higher Education, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 03-123, at 2 (May 28, 2008) (ACUTA *Ex Parte*) ("[O]f the three proposals offered, the AT&T and Neustar proposals were more open to use with various types of telecommunications systems that would be in use on college campuses . . .").

¹⁵² Only carriers can access the NPAC, see NeuStar Refresh Comments, Appendix A at 9; only Internet-based TRS providers could access the Joint Proposal's database, see AT&T *Ex Parte*.

Commission's December 31, 2008 deadline is met.¹⁵³ NeuStar argues that the processes and procedures necessary to provision information to and obtain information from the NPAC are well established.¹⁵⁴ As discussed in greater detail below, however, we believe it is possible to build a new central numbering database as set out in the Joint Proposal's ORD with appropriate governance structures prior to the Commission's deadline.¹⁵⁵

59. In the absence of compelling evidence that NeuStar's TRU approach is more likely to be implemented by our deadline, there is little reason to adopt a solution that causes Internet-based TRS providers to be anything other than directly responsible for provisioning routing information to the central database. We do not believe that requiring the insertion of a third party – such as a carrier that is an authorized NPAC user – into the process of provisioning and obtaining information from the central database is beneficial to the efficient operation of Internet-based TRS. Further, the record reflects concerns that carriers may not have the incentive to make changes necessary to fully automate the process of provisioning routing information for Internet-based TRS providers to the central database.¹⁵⁶ Finally, NeuStar's TRU proposal appears to have less flexibility with respect to modifications and updates that may be necessary in the future. Any additional changes to the NPAC would require the approval of the North American Portability Management (NAPM) LLC and a North American Numbering Council (NANC) working group.¹⁵⁷ These entities, which consist primarily of carriers, will not be possessed of the same incentives as Internet-based TRS providers when considering ways to optimize the provision of information to the central database. Thus, the Joint Proposal's ORD provides an easier and more flexible path to modifying the information in the central database.

60. *Obligations of Default Providers and Former Default Providers.* This approach imposes certain obligations on default providers. Default providers must obtain current routing information, including URIs containing IP addresses or domain names and user names, from their Registered Internet-based TRS Users, provision such information to the central database, and maintain it in their internal databases and in the central database.¹⁵⁸ An Internet-based TRS user's CPE should directly provide necessary routing information to the Internet-based TRS user's default provider. All CPE issued, leased, or otherwise provided to Internet-based TRS users by Internet-based TRS providers must be capable of facilitating the fulfillment of these requirements.

61. Conversely, Internet-based TRS providers (and, to the extent necessary, their numbering partners) must take such steps as are necessary to *cease* acquiring routing information from any Internet-based TRS user that ports his or her number to another provider or otherwise selects a new default provider. Specifically, every Internet-based TRS provider must ensure that all CPE they have issued, leased, or otherwise provided to Internet-based TRS users delivers routing information or other information only to the user's default provider, except as is necessary to complete or receive "dial around" calls on a case-by-case basis.

¹⁵³ NeuStar Refresh Comments at 4.

¹⁵⁴ NeuStar states that modifications to the NPAC can be completed in two weeks, with necessary upgrades to provider systems and processes requiring three to four months. NeuStar Workshop Deck at 21.

¹⁵⁵ See *infra* paras. 69–70.

¹⁵⁶ See GoAmerica ORD Supplement at 14 (asserting that carrier updates to SOA will take significant time, if they are made at all); GoAmerica ORD Responsive Supplement at 10 (raising concerns that NeuStar's approach would require "a new cycle of LNPA/NPAM LLC work and interface development by all parties to add new URIs").

¹⁵⁷ See AT&T Refresh Reply Comments, Attach. 1.

¹⁵⁸ See *supra* paras. 51, 53; see also Letter from Rosaline Hayes Crawford, Director, Law and Advocacy Center, National Association of the Deaf, to Marlene H. Dortch, Secretary, FCC, CG Docket 03-123 (filed June 5, 2008).

62. In addition, Internet-based TRS providers and their numbering partners also must communicate among themselves as necessary to ensure that only the default provider provisions routing information to the central database, and that providers other than the default provider are aware that they must query the central database in order to obtain accurate routing information for a particular user of Internet-based TRS.

63. In order to ensure that the telephone numbers of Internet-based TRS users are fully portable, that their devices are interoperable, and their privacy is protected, if an Internet-based TRS provider cannot provide service to a particular user in the manner described in this *Order*, the Internet-based TRS provider must not provide service to that user without seeking prior approval of the Commission.

c. Authorized Access to the Central Database

64. We next address the issue of who will be authorized to query the central database for the purpose of obtaining information from the database to complete calls.

65. CSDVRS's ONS proposes to allow the public direct access to the central database. The CSDVRS ONS is logically a part of the global DNS hierarchy that supports the Internet, and CSDVRS argues that such open access is comparable to the addressing system utilized by the public Internet.¹⁵⁹ Thus, any individual with access to the Internet would also be allowed to query the central database in order to obtain an Internet-based TRS user's IP address.

66. We decline to adopt a public direct access model. The record reflects that there are significant concerns regarding the ability to maintain the security of the central database if public direct access is allowed.¹⁶⁰ The record also reflects that allowing public direct access to the central database would jeopardize the privacy of Internet-based TRS users.¹⁶¹

67. NeuStar's TRU proposal restricts access to the central database to a limited number of authorized NPAC users -- generally carriers or specialty service providers.¹⁶² Similarly, the Joint Proposal's ORD would restrict access to the central database to the universe of Internet-based TRS providers.¹⁶³ Although these proposals make use of industry-standard DNS and ENUM technology, they are not logically part of the global DNS. As is the case with provisioning information to the central database,¹⁶⁴ there is little compelling reason to insert a third party into the process of querying the central database for routing information. Further, the record reflects that restricting access to the universe of

¹⁵⁹ See CSDVRS Refresh Reply Comments at 6 (noting that the ONS database would be "built on . . . the same system that provides address resolution for the Internet"); *id.* at 12 (claiming an open access platform, like the Internet, is needed to prevent Internet-based TRS providers from restricting innovation in new TRS platforms).

¹⁶⁰ AT&T Refresh Reply Comments at 5; NeuStar Refresh Reply Comments at 19; Sorenson Refresh Reply Comments at 10. Even CSDVRS admits that its public access model requires "additional measures" to "protect[] the user from attacks on the Internet." CSDVRS Refresh Comments at 37.

¹⁶¹ NeuStar Refresh Reply Comments at 19. We also note CSDVRS's assertion that a key benefit of public direct access is that it would enable anyone equipped with a computer, an IP-enabled video camera, and an Internet connection to directly connect to Internet-based TRS users without the direct involvement of any Internet-based TRS provider. See CSDVRS Refresh Reply Comments at 2. We note that such calls are not TRS calls and therefore are not regulated or compensated under section 225. See *Interoperability Declaratory Ruling and FNPRM*, 21 FCC Rcd at 5448 n. 53. This potential benefit is therefore outside the scope of this order.

¹⁶² See NeuStar Refresh Comments, Attach. at 9.

¹⁶³ See AT&T *Ex Parte*.

¹⁶⁴ See *supra* para. 59.