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Federal Communications Commission
Washington, D.C. 20554

April 21, 2008

Richard L. Fruchterman, III
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Re: Motion to Accept Filing as Timely
Filed in CG Docket No. 03-123

Dear Mr. Fruchterman:

The Office of the Secretary has received your request for acceptance of the document filed by NeuStar, Inc. in the above-referenced proceeding as timely filed, due to technical difficulties with the Commission's Electronic Comment Filing System.

In accordance with 47 C.F.R. Section 0.231(i), I have reviewed your request and your assertions. After considering the relevant arguments, I have determined that these filings will be accepted as timely filed on April 18, 2008. If we can be of further assistance, please contact the Office of the Secretary.

Sincerely,

Marlene H. Dortch

Marlene H. Dortch
Secretary

MHD/gt

cc: Consumer & Governmental Affairs Bureau

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

FILED/ACCEPTED
APR 2 1 2008
Federal Communications Commission
Office of the Secretary

In the Matter of	)	
	)	
Telecommunications Relay Services and	)	
Speech-to-Speech Services for Individuals	)	CG Docket No. 03-123
With Hearing and Speech Disabilities	)	

REPLY COMMENTS OF NEUSTAR, INC.

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April 18, 2008

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SUMMARY

In its initial comments in this proceeding NeuStar, Inc. ("NeuStar"), put forward a detailed plan called Telephone numbers for Relay Users, or TRU, to assign ten-digit NANP telephone numbers to users of all IP-based forms of TRS. Under TRU, Relay Providers will obtain North American Numbering Plan ("NANP") telephone numbers ("TNs") from local exchange carriers ("LECs") and assign these numbers to deaf and hard of hearing ("Deaf/HoH") users. Working with their LEC numbering partners, the Relay Providers will provision the numbers into the existing Number Portability Administrative Center ("NPAC"), including a Uniform Resource Identifier ("URI") in addition to the customary NPAC data. The URI information in the NPAC will be used to route certain calls – hearing person to Deaf/HoH calls using an alternate relay provider and Deaf/HoH to Deaf/HoH calls – to the correct Relay Provider for completion to a relay user.

Two other number plans were described in the comments: one by GoAmerica and another by CSD. Under the GoAmerica plan, numbers are assigned to users through their Relay Providers. The end user's equipment will update the Relay Provider with its current IP address and the Relay Provider, in turn with update a new central database. Just as the NPAC under TRU, the central database will be used for the routing of certain calls. The CSD plan also uses a new central database that is used for the routing of all calls. Under its plan, the central database administrator obtains TNs and distributes them to all VRS users. The central database administrator also manages the users' selection of Relay Providers, supplies E9-1-1 location databases for all users, selects telephone carriers that all Relay Providers must use and provides PSTN to IP gateway service for all Relay Providers.

In these reply comments, NeuStar demonstrates that its plan can be implemented quickly – certainly well before the Commission's December 31, 2008 deadline. Concerns that implementation may be slowed because of the time it takes for carries to make changes to their NPAC provisioning systems are unfounded. There are a variety of means that can be used to provision URI information into the NPAC, including a GUI interface and the NPAC help desk. Similar concerns that Relay Providers may not be able to establish the necessary inter-provider signaling links and gatekeeper systems quickly enough are likewise inaccurate. NeuStar's reliance on standards-based equipment should enable Relay Providers to deploy the necessary systems quickly. The inter-provider signaling links and gatekeeper functionality are necessary for network security and also create the opportunity for a new level of E9-1-1 interoperability.

NeuStar believes that the other two proposals will take a significant amount of time to implement because they require definition of new processes and procedures, the selection of a new database administrator and the creation of entirely new systems.

Unfortunately, the other two proposals also create significant concerns. Because they do not propose any form of registration and authentication, relay users are force to keep their firewalls open for any communication coming from the Internet. Such a gaping security hole will leave relay users vulnerable to attack. Even worse, CSD proposes that its central database, containing the TNs, IP address and physical locations of Deaf/HoH users, will be on the public Internet. This approach puts the privacy of Deaf/HoH users at severe risk.

NeuStar's TRU approach can be implemented quickly, provides greater functional equivalency, is more secure and better protects the privacy of the deaf and hard of hearing. NeuStar strongly urges the Commission to adopt NeuStar's TRU proposal.

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Telecommunications Relay Services and	)	
Speech-to-Speech Services for Individuals	)	CG Docket No. 03-123
With Hearing and Speech Disabilities	)	

REPLY COMMENTS OF NEUSTAR, INC.

NeuStar, Inc. ("NeuStar") submits these Reply Comments to the initial comments filed on April 8, 2008 in response to the Public Notice issued by the Consumer & Governmental Affairs Bureau seeking to refresh the record on assigning Internet Protocol ("IP")-Based Telecommunications Relay Service ("TRS") users ten-digit telephone numbers ("TNs" or "TN" if singular) linked to the North American Numbering Plan ("NANP").[1]

I. INTRODUCTION

In its initial comments in this proceeding, NeuStar put forward a detailed plan, called Telephone numbers for Relay Users ("TRU") to assign NANP TNs to the users of IP-based TRS, using the Number Portability Administrative Center ("NPAC") as the central database to accomplish the necessary routing.[2] NeuStar also demonstrated how TRU accomplishes critical goals that should be required of any numbering system.[3] These goals, include, *inter alia*:

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[1] *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 03-123, Public Notice, DA 08-607 (rel. Mar. 19, 2008)(*2008 Numbering PN*); *see also Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CG Docket 03-123, Declaratory Ruling and Further Notice of Proposed Rulemaking, 21 FCC Rcd 5442, 5459-62, paras. 44-57 (May 9, 2006)(*Interoperability FNPRM*).
[2] *See* Telephone Numbers for Relay Users, ("NeuStar White Paper") attached as Appendix A to Comments of NeuStar, Inc., CG Docket 03-123, filed April 8, 2008 ("NeuStar Comments").
[3] *See* NeuStar Comments at 3-4.

functional equivalency to the telecommunications services provided to hearing persons,[4] including E9-1-1 services that use the same approach and systems that are currently used by VoIP providers;[5] portability between relay providers, and interoperability between relay providers and all relay users; ensuring the privacy of the deaf and hard of hearing ("Deaf/HoH") users' consumer data and providing security from Internet attacks;[6] mitigation of relay fraud; consistency with existing technology and accepted standards; the provision of one solution to support all relay services and, finally, cost effectiveness and capability for rapid deployment.

Two other numbering schemes were also proposed: one by GoAmerica, Inc., GoAmerica Relay Services Corp. and Hands on Video Relay Services (collectively "GoAmerica") and AT&T (hereinafter referred to as the "GoAmerica plan"), and another by Communications Services for the Deaf and CSDVRS (hereinafter referred to as the "CSD plan"). These reply comments will describe how NeuStar's TRU plan advances the Commission's objectives of a uniform numbering system and will better serve the needs of the Deaf/HoH communities.

II. THE PLANS

A. NeuStar's TRU plan

As explained in NeuStar's comments, pursuant to TRU, VRS providers and other IP-based TRS providers (collectively "Relay Providers") will obtain NANP TNs from local exchange carriers ("LECs") and assign these numbers to Deaf/HoH users who have selected them as default providers.[7] This is exactly the same manner through which VoIP providers obtain and distribute telephone numbers today. The Relay Providers, working with their LEC

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[4] *See Interoperability NFPRM* at para. 5. ("Congress specifically mandated in Section 225 that relay services offer access to the telephone system that is "functionally equivalent" to voice telephone services.")

[5] *See Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing Disabilities; E911 Requirements for IP-Enabled Service Providers*, CG Docket No. 03-123, WC Docket No. 05-196, Report and Order, FCC 08-78 (rel. March 19, 2008)(*E911 R&O*) at para. 22.

[6] *See* "Numbering for Internet-Based Relay Services," ATIS Report 0300093 (December 19, 2007) discussion of security issues at section 6.0. (*INC Report*)

[7] *See* NeuStar White Paper at Section 2.

numbering partners, will provision the numbers into the NPAC, providing a Uniform Resource Identifier ("URI")[8] in addition to the customary NPAC data. This URI will be used only in certain circumstances, described in more detail below, to route a telephone call to the video phone ("VP") or other IP-based device of the called party. NPAC data is routinely downloaded either to carriers or to NPAC clearinghouses[9] where the data can be queried as calls are being placed. The URI will be used by any Relay Provider to route calls to a user of another Relay Provider.

Relay Providers will maintain lists of the IP addresses of the devices employed by users who have selected them as their default provider; this list will be dynamically updated as the IP addresses change.[10] These IP addresses will be used to route calls to the Deaf/HoH users.

Direct-dialed calls to a relay user's TN are routed through the public switched telephone network ("PSTN") to their default Relay Provider using traditional telecommunications routing. Upon receiving the PSTN call, the Relay Provider routes the call to one of its Relay Operators

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[8] URI's are "short strings that identify resources in the web: documents, images, downloadable files, services, electronic mailboxes, and other resources, e.g. sip:1794867309@provider.com or http://www.w3.org/Addressing/#background." *INC Report* at p. 32

[9] Sprint Nextel, without any supporting documentation, expressed concern that "the charge for accessing the NPAC database could be rather high." Comments of Sprint Nextel, CG Docket 03-123, filed April 8, 20008 ("Sprint Nextel Comments") at fn 7. The NPAC intrinsically has no cost to access the database. As explained in NeuStar's Comments costs are placed on adding or modifying records and ranges from $0.75 to $0.95 per transaction depending upon volume. These costs are incurred once per number added to or ported within the NPAC database. The NeuStar proposal included the likelihood that a clearinghouse would be used by a relay provider to access the database. As described in NeuStar's comments there is a highly competitive market of NPAC clearinghouses. NeuStar itself provides such clearinghouse services and competes with VeriSign, Syniverse, NetNumber, Syncronoss and others for the clearinghouse business of smaller carriers that do not wish to interface directly to the NPAC database. These clearinghouses do not pay NPAC for this data and provide the data to carriers at a fraction of a cent per query. NeuStar charges less than $.005 per query with a $500 per month minimum.

[10] *See* NeuStar White Paper, Appendix A, at Section 5.

("RO")[11] and, using the IP address maintained in its directory, establishes an Internet connection with its subscriber's device.[12]

Direct-dialed calls from a relay subscriber to a hearing person work in a reverse but similar manner. The relay subscriber establishes an Internet connection with his/her default provider or with any VRS or other IP-based relay service provider they chose. The relay service provider then establishes a PSTN connection to the hearing person.[13]

As mentioned above, the URI information that has been associated with a TN in the NPAC database is needed to complete calls in only two circumstances. First, if a hearing person chooses to call a Deaf/HoH person through a Relay Provider that is not the Deaf/HoH person's default provider, the chosen Relay Provider needs to be able to determine which VRS provider is the default provider for the relay user. The chosen Relay Provider will first query the database of an NPAC clearinghouse service to obtain the URI associated with that TN; the URI directs the chosen Relay Provider to the default Relay Provider, which uses its IP address directory to direct the call to the relay user's device.[14]

The second circumstance where the URI database is necessary is when a Deaf/HoH person calls the TN of another Deaf/HoH person to establish a connection that does not require an RO. The calling party's device places the call through its default Relay Provider. The calling party's default Relay Provider will query its chosen NPAC clearinghouse to obtain the URI associated with that TN and, using the URI, will direct the call to the default Relay Provider of

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[11] NeuStar recognizes that traditional TRS operators are known as Communications Assistants ("CAs"), VRS operators are known as Video Interpreters ("VIs":), and IP-based Relay operators are known as Relay Operators ("ROs"). Throughout this document, NeuStar uses the term Relay Operator as a generic designation for any individual utilized by a Relay Provider to provide relay services through signed, voice or text response.
[12] *See ibid.* at Section 5.1.
[13] *See ibid.* at Section 5.2
[14] *See ibid.* at 5.1.

the called party. The called party's default Relay Provider will use its IP address directory to complete the call to the called party's device.[15]

A critical component unique to TRU is that users, or more precisely users' equipment, must register with a default Relay Provider before originating or receiving any communications. This registration is similar to how a computer user logs on to computer network or how a VoIP Telephone Adapter registers with a VoIP providers' network. As was described in NeuStar's comments and will be reiterated below, this aspect of TRU is extremely important to ensure the security of the TRS network and its users.

NeuStar's TRU approach would also enable Relay Providers to provide E9-1-1 services in the same manner as VoIP providers do so today.[16] Each Relay Provider will select the VoIP Positioning Center ("VPC") and the Emergency Services Gateway ("ESGW") with which it wishes to do business.[17] The VPC will have a copy of the Relay Provider's database that matches telephone numbers to physical addresses. When a user dials 9-1-1, the default Relay Provider will route the call on a priority basis to an RO, who in turn will extend the call to the VPC. The VPC will perform the address look up and determine which Public Safety Answering Point ("PSAP") should receive the call. The VPC then routes the call to ESGW for routing to the selective router serving the appropriate PSAP.

B. GoAmerica Plan

The GoAmerica plan[18] is very similar to TRU in that Relay Providers will obtain TNs from LECs to provide to their users, just as VoIP providers do today. The relay users'

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[15] *See ibid.* at 5.3.
[16] *See* NeuStar White Paper at Section 5.4.
[17] There are multiple entities available today to provide both the VPC and ESGW functions.
[18] *See* Comments in Response to Request for Refreshment of the Record on Assignment of North American Numbering Plan Numbers to Internet Based Relay Users and Related Issues, GoAmerica, Inc., GoAmerica Relay Services, Corp., Hands on Video Relay Services, Inc., CG Docket 03-123, filed April 8, 2008 ("GoAmerica Comments")

equipment will update default relay providers with their IP addresses. The plan proposes creation of a new, relay-only central DNS database. The GoAmerica plan has separate processes for VRS and other forms of relay. For VRS, the VRS provider updates the database with the IP address of the video phone ("VP"). For all other forms of relay, the provider associates a URI with the TN, similar to TRU. As with the TRU solution, when a direct dialed call is placed, it will be routed through the PSTN to a user's default Relay Provider, where an RO will make an IP connection to the user.

The central database is needed for the same two circumstances that is required under the TRU plan: first, when a hearing person places a call using a Relay Provider that is not Deaf/HoH person's default provider, and second, when a Deaf/HoH person calls another Deaf/HoH person directly. For example, when a hearing person, rather than dialing direct, places a call through the toll free number of a Relay Provider which is not the default provider of the Deaf/HoH person, the Relay Provider selected by the hearing person will use the Deaf/HoH person's TN, provided by the hearing person, to query the central database to obtain the address of the Deaf/HoH person's IP-based TRS equipment. For VRS, this would be the IP address of the VP. For other forms of relay it would be a URI.

With respect to E9-1-1-, the GoAmerica plan proposes the same approach put forward by NeuStar, i.e., each Relay Provider selects its own VPC and ESGW in a manner identical to VoIP providers..

C. CSD Plan

The CSD plan[19] takes an entirely different approach. Like the GoAmerica plan, it also proposes to use a new central DNS database, but rather than receiving IP address updates from

[19] *See* Comment of CSDVRS, LLC and Communications Service for the Deaf on Assigning Internet Protocol-Base Telecommunications Relay Service User Ten-Digit Telephone Numbers Linked to the North American Numbering Plan, CG Docket 03-123, filed April 8, 2008 ("CSD Comments").

the users' default Relay Providers, for VRS only, the central database in the CSD plan will receive IP address updates directly from the end users' equipment, or from a device CSD would design and supply to the end user.[20] For other forms of relay, CSD would store a URI similar to TRU. In addition, instead of Relay Providers obtaining and issuing TNs to users as is the case with TRU and the GoAmerica plan, CSD would have a new central administrator obtain TNs from LECs and distribute them to the Deaf/HoH users. Further, the central administrator would provide the incoming and outgoing PSTN services to all Relay Providers.

Unlike TRU or the GoAmerica plan, which only require the querying of the central database for a subset of calls, the CSD proposal forces Relay Providers to query the ONS database for every call. Thus, if a hearing person direct dials to a relay user, the call will be routed via ONS to the user's default Relay Provider, which would then query the ONS central database, rather than its own internal database, to determine the user's current IP address to complete the call.

With regard to E9-1-1, CSD proposes that, instead of having each Relay Provider contract with its own VPC, ONS will contract with a single VPC and manage E9-1-1 for all Relay Providers.[21]

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[20] CSD claims that ONS will use ENUM. CSD Comments at 13. However, CSD also describes the form of query to the DNS database as xxx.yyy.zzzz.vrs.tv. The ENUM work group in the IETF is chaired by a NeuStar staff member; he and other NeuStar employees have written several of the standards that define ENUM. NeuStar has supplied ENUM technology to a wide range of telecommunications carriers. What CSD is describing is not ENUM. The query using ENUM for the telephone number 202 555 1212 would be 2.1.2.1.5.5.5.2.0.2.1.e164.arpa and not 202.555.1211.vrs.tv. Further, ENUM does not return IP addresses; it returns URIs in the form of a NAPTR (ref RFC3761). End devices do not use ENUM. Service providers use ENUM to translate telephone numbers to URIs. If TRU was implemented, and a relay provider elected to use the NeuStar clearinghouse, the interface to the clearinghouse could be ENUM. ENUM is based on DNS. All three proposals contemplate that DNS in general, and ENUM in specific, will be used to query the database, but CSD is confused about how ENUM could be used with its proposal.

[21] CSD asserts that using just one VPC will help hold costs down because it will require only one VPC subscription for ONS rather than ten to fifteen subscriptions for the entire industry. However, some VPC providers with which NeuStar has met have committed to offering their services at the same rate that they are provided to VoIP providers – approximately $1.00 per month per TN. If the VPC providers hold true to their pricing, it is only the aggregate number of TNs involved that matters, not the number of Relay Provider subscriptions.

III. NEUSTAR RESPONSES TO CONCERNS ABOUT ITS TRU APPROACH

Several concerns were raised in the comments about NeuStar's TRU plan. GoAmerica, for example, expresses concern that TRU requires not only that a new field be added to the NPAC database, but that carriers also will be required to modify their NPAC provisioning systems in order to accommodate the new field, causing delay in the implementation of a solution.[22] NeuStar believes that GoAmerica's concern is unfounded and is inconsistent with NeuStar's experience when adding other fields to the NPAC.[23] Once requested by the NAPM, LLC to add the field to the NPAC. NeuStar could make the update within 14 days. Carriers have three options for updating the NPAC. They can do it over a mechanized interface, over a web interface, or by working with the NPAC Help Desk. The mechanized interface, called the service order administration (SOA) interface, would take the longest to update. This could take up to months. The web interface, called the low tech interface (LTI), will be available for at the same time that the field is added to the NPAC. The LTI is so efficient that some nationwide carriers use it to do all of their updates to the NPAC. The Help Desk has a web interface relay providers can use to generate their updates as long as they have a letter of agency from their telecom provider. Finally, they could simply call the Help Desk if they so desired. This capability will be available as soon as the field is added to the NPAC. These alternatives are not mutually exclusive. In other words, if the carrier has a SOA interface they can also use the LTI and Help Desk if desired. It is not uncommon for a carrier to have an interim solution of using the LTI or the Help Desk to make updates while they are waiting to get their SOA updated. It is also not uncommon for carriers to do certain types of updates over the SOA and other types of

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[22] GoAmerica Comments at 15. *See also* Comments in Response to Consumer & Government Affairs Bureau Seeks to Refresh the Record on Assigning Internet Protocol (IP)-Based Telecommunications Relay Service (TRS) Users Ten-Digit Telephone Numbers Linked to the North American Numbering Plan (NANP) and Related Issues, Dash Carrier Services, LLC, CG Docket 03-123, filed April 8, 2008 ("Dash Comments") at 5.

[23] Typically, carriers make these kinds of system changes when periodically upgrading their provisioning software.

updates over the LTI or through the Help Desk. It would seem reasonable to expect a carrier to develop and implement comprehensive methods and procedures for updating the NPAC for the URI over the LTI or the Help Desk within 30-60 days.

Concern was also raised by Sprint Nextel, about the time and cost that would be required for the Relay Providers to connect with one another to enable the signaling that is necessary under the TRU plan.[24] Because TRU contemplates the use of standard interfaces, the necessary equipment to establish these signaling links is readily available in the market, so the cost of setting up the inter-provider connections, while not trivial, will not be excessive. In many respects, the system described in the TRU plan resembles the intranet of a corporate enterprise – it is capable of being implemented with existing off-the-shelf technology. In addition, as will be discussed in more detail below, the signaling network contemplated in TRU provides significant security and E9-1-1 benefits to IP-based TRS users.

Using standards based signaling, secure inter-provider signaling can take place across the Internet. To have a closed system, resistant to attack, providers must limit who can extend a call to them. Some form of credentialing of service providers must be created. NeuStar suggests that qualified providers be issued an X.509 certificate signed by a suitable Certification Authority.[25] The certificate would then be used by the security mechanisms in the signaling protocols to restrict entry to relay provider's systems. Such a solution requires only weeks to implement, allows new certified entrants instant access to all other providers in a secure manner, and has no substantial costs beyond the standards based equipment and services described above.

It must be recognized that there is a tradeoff between cost of entry of a new relay provider and security. If a new entrant can create a website, download some open source

[24] Sprint Nextel Comments at fn 7.

[25] A number of entities can provide the Certification Authority. NeuStar would be willing to undertake this for a small fee of $250 per year per relay provider.

software, and then easily gain entry to the entire network and databases underpinning the system, then there is no effective security or identity protection for users.

NeuStar notes that its suggestions on security are independent of the choice of database. Using the NPAC as the central database does not intrinsically require the use of URIs and re-enabling firewalls. We believe that providing relay users with the same level of security that is afforded other telecommunications users is an independent requirement. Only the NeuStar proposal includes this essential feature. Both the CSD and GoAmerica proposals assume the existing practice of disabling firewall protection of the VPs. In their zeal to prevent the default provider from seeing the signaling to alternate providers, they expose users to attack for anyone on the Internet.

Sprint Nextel also raised a concern that if the TRU approach is adopted, a user might be forced to resort to providing location information manually if using a Relay Provider other than its default provider to make an emergency 9-1-1 call. Sprint Nextel contends this is the case because the user's location is resident in the database of the user's preferred provider, which the alternate provider may not be able to access.[26] Sprint Nextel proposes that the location information instead be placed in the central directory, available to all providers. For all extant VPC implementations, however, the user's location information is copied into a VPC's database for the routing of 9-1-1 traffic. Not only is a central database not needed for routing 9-1-1 traffic, putting the physical location, telephone number and IP address into one database, as

[26] *Ibid.* at 6. Sprint Nextel separately mentions its concern that each Relay Provider would have to maintain its own location database. It is not clear that this is the same issue that Sprint Nextel is raising with regard to E9-1-1, but it should be noted that both the NeuStar and the GoAmerica plan require each Relay Provider to maintain such a database and to share a copy of the information in its database with its VPC. It should be recognized that these are very simple databases, and should not be any kind of burden to a Relay Provider. The cost savings of a single database (as contemplated by the CSD plan) versus separate databases (as contemplated by the NeuStar and GoAmerica plans) is finite, but very small. In fact, some VPCs provide the database for their customers.

Sprint Nextel suggests, makes a bad security situation decidedly worse. All deaf and hard of hearing user's personal information would be in a single, relatively vulnerable database.

However, Sprint Nextel did identify an issue that may be of concern with any plan that proposes that Relay Providers select their own VPCs – as both NeuStar and GoAmerica's plans do. If a relay user places a 9-1-1 call using an alternate Relay Provider, the call will be routed with necessary location information only if the two Relay Providers subscribe and provide user location data to the same VPC. If the alternate Relay Provider uses a different VPC than the default provider, that VPC will not have the user's location information in its database.

One way to overcome this would be to require that all Relay Providers use the same VPC, a solution that is consistent with the CSD plan which proposes the ONS contract with only one VPC. But this approach deprives the Deaf/HoH and Relay Provider of the benefits of the competitive VPC market.

NeuStar's TRU approach solves this problem by enabling any alternate default Relay Provider to route the call to the default Relay Provider's VPC, where the user's location information resides. This is possible because, even though the user initiated the call with an alternate provider, the signaling for the call goes through the default provider. When the call is routed to the alternate provider, the message header contains information including the user's telephone number and default Relay Provider, e.g. sip:+12025551212@xyzvrs.net, which enables the alternate provider's RO to route the call to the proper VPC via the default provider using a distinguished URI such as vpc@xyzvrs.net.

Moreover, NeuStar's inter-provider signaling could enable the IP-based TRS industry to vastly improve the 9-1-1 experience for the Deaf/HoH. Even with priority treatment, users often have to wait for an available RO to handle their 9-1-1 call. If they choose to drop their original

call and go with an alternate provider, they will have to locate the contact information for a different provider and reinitiate the call – all while encountering a potentially life threatening emergency. With inter-provider signaling, the industry can remove that burden from the Deaf/HoH users. If the default Relay Provider does not have an RO immediately available to handle a user's 9-1-1 call, inter-provider signaling can enable that urgent call to be routed to the first available RO of any Relay Provider offering a similar type of relay service – without forcing the user to take any other action. This alternate provider's RO can handle the call and send it to the right VPC so the call can ultimately reach the correct PSAP. As CSD notes, "[r]ather than take a chance that a severe emergency could overwhelm an individual provider and potentially compromise the health and safety of relay users, all of the resources of the relay industry should be seamlessly utilized to respond effectively."[27] NeuStar agrees; its signaling approach will enable the resources of the entire relay industry to work together seamlessly to provide emergency help to the Deaf/HoH.

Sprint Nextel and CSD assert that TRU's requirement for registration with a default Relay Provider will enable that provider to track all of users TRS traffic, even if the user selects an alternate Relay Provider for a particular call and even if the user makes a point-to-point connection with out the need for an RO.[28] CSD goes so far as to claim that "[t]he potential for unauthorized call tracking in these scenarios is unprecedented in telecommunications law."[29] But there is nothing unprecedented about this situation. Indeed, all of a hearing person's telephone calls, local and long distance, originate or terminate through their local service provider. In most instances, a hearing person cannot, as is being contemplated with IP-based TRS, use an alternate local service provider without first porting its telephone number to the new

[27] CSD Comments at 32.
[28] Sprint Nextel Comments at fn 7 and CSD Comments at 15.
[29] CSD Comments at 15.

service. The person might be able to use a long distance provider other than the long distance affiliate of its local service provider, either through presubscription or dialing around, but any such calls not only can be tracked, but will be tracked, by the local service provider, if for no other reason than to assess access charges. The Commission has adopted rules to prevent the misuse of this information in the telecommunications industry; those rules should be extended to IP-based TRS.

Further, as NeuStar has pointed out, requiring signaling to transit the default Relay Provider is a security issue: it allows firewalls to be restored to normal operation, and restricts access to the database and the call signaling to authorized entities. It is not tied to the choice of database. The tradeoff of the concern of the default Relay Provider being able to monitor usage of customers using alternative providers must be balanced against the significant security improvements gained.

CSD also attempts to argue that under both TRU and the GoAmerica plan, users will be locked into whatever Relay Provider issues their TN and video phone and that, even if the user attempts to change Relay Providers, the IP address will still be processed by the original provider, enabling that provider to track the users calls.[30] CSD, however, is not correct in its analysis of how consumer TRS equipment will interact with Relay Providers under TRU. Under TRU, IP-based customer TRS equipment will provide IP address updates to the users' selected default Relay Provider and only to the default Relay Provider. If the end user ports its number to a new service provider, and that service provider agrees to support the end user's existing equipment, it is expected that the equipment will provide IP address updates to the new service provider. Standards based equipment can be provisioned to support this capability. NeuStar is aware that not all equipment presently in the field meets the industry standards or has proprietary

[30] *Ibid.* at 18.

methods for achieving this level of service independence. Software upgrades may be needed in some cases, but NeuStar believes such systems must have upgrades for security purposes as explained below.

CSD also attempts to claim that some users will be denied service because, unlike their plan, other plans require users to acquire a device that is either distributed by or approved by a VRS provider in order to use the numbering system. CSD offers the example of a hearing person who is fluent in American Sign Language ("ASL") that CSD claims would be denied a video phone ("VP") under all other options.[31] The issue raised here by CSD has nothing to do with the other numbering proposals and, instead, is a policy issue concerning who should be able to use the IP-based TRS system. It is for the FCC, the Relay Providers and the TRS administrators, not the numbering system, to decide this question of access. Clearly, if the FCC determines that hearing people fluent in ASL are eligible to receive a TN and a VP from a Relay Provider, or if a Relay Provider decides to do so on its own, the hearing user can be easily accommodated under TRU.

The issue does highlight, however, a major shortcoming of the CSD and GoAmerica approaches. Their proposals will allow unauthenticated callers to access the VPs and other IP-based relay equipment of the relay customers. In order to receive such calls, the users are forced to open ports in their firewalls to accept unknown Internet traffic from anyone. This makes the relay equipment and possibly the computer networks of these Deaf/HoH users extremely vulnerable to Internet attack. Furthermore, enterprise networks, hotel networks, government networks, and any other network which has significant security protection would block access to Deaf/HoH users. Nearly all such networks have firewall policies that could not work with either the CSD or the GoAmerica proposal. The inability of users to be able to get any service in an

[31] *Ibid* at 15-16.

enterprise, hotel or government facility is a significant departure from the goal of functional equivalence.

From a security standpoint, it is much better if every user is registered with and is authenticated by its Relay Provider. This creates a closed system, not in the sense that users are locked in to certain Relay Providers, but in the sense that the PSTN, cellular and VoIP networks are also closed systems, *i.e.,* they can only be accessed by authenticated users of a telecommunications carrier or VoIP service providers. VoIP systems are built in this manner, and do not require firewall disabling.

GoAmerica and Dash Carrier Services, LLC ("Dash") assert that the use of a single field in the NPAC will limit a Deaf/HoH user from being able to designate a single 10 digit NANP number to use with multiple types of relay services. The contention appears to be that one number should be able to be used to reach a relay user's VP and also IP relay text device, even when the services are obtained from disparate providers.[32] However, this is well beyond functional equivalency with the PSTN, where different services require different TNs. For example, a hearing user will have one number for wireline service and another number for wireless service. Some providers have begun to offer forwarding services, so that when a wireline TN is not answered within a specified time, it will automatically forward to a designated second number, such as the TN associated with the user's wireless telephone, and Relay Providers could do the same.[33]

The NPAC can readily accommodate multiple URIs for separate services. The need for such a capability was anticipated and the implementation will permit a wide variety of services

[32] GoAmerica Comments at 27 and Dash Comments at 10.
[33] Dash also asserts that the NeuStar approach is not capable of supporting multiple protocol designations; however, as noted above, such capability is included in the TRU proposal.

to have separate URIs. Thus, should multiple services for one TN become necessary, TRU can easily accommodate such a capability.

IV. CONCERNS WITH THE GOAMERICA AND CSD PROPOSALS

A. Implementation in a Timely Fashion

Both the GoAmerica proposal and the CSD proposal envision that a new central database will be created to associate TNs with IP addresses for the routing of IP-based TRS traffic. Both GoAmerica and CSD acknowledge that a new neutral third party is required to manage this new database. In addition, under the CSD proposal, the neutral third party will be required to take on substantial additional responsibilities for managing the ONS, such as handling number assignment and porting, providing PSTN gateways, and contracting with a VPC that the other proposals leave with the individual Relay Providers. In order to obtain such a neutral third party as the database or ONS administrator there are a number of steps that must be taken.[34]

First, the FCC and the industry must come to agreement on what it means to be a neutral third party ("NTP"). ATIS' Industry Numbering Committee ("INC") provides a good start on what should be looked at in determining neutrality. In its December report, the INC said that the "relay service neutral third party shall not:

- Be an Internet-based relay provider;
- Be owned by an Internet-based relay provider;
- Be an affiliate of an Internet-based relay provider;
- Have an organizational affiliation with an Internet-based relay provider; or
- Be permitted to have an equity stake in, or a board member involved with, any Internet-based relay provider."[35]

[34] Sorenson Communications, Inc. ("Sorenson") put forward a list of implementation issues that must be addressed by the industry and the Commission regardless of which database approach is taken. *See* Comments of Sorenson Communications, Inc., CG Docket 03-123, filed April 8, 2008 ("Sorenson Comments") at 16-20.
[35] INC Report at 10.

INC went on to add that "[i]t has not been determined whether the routing database administrator has to be neutral to the telecommunications service industry; however, it is agreed that the relay number administrator shall not be a telecommunications service provider."[36]

As NANP and pooling administrators for the FCC and as the administrator of the NPAC for the telecommunications industry, NeuStar is committed to the principle of neutrality and believes that neither the routing database administrator nor the relay number administrator should be a telecommunications service provider ("TSP") or TSP affiliate. Several of the Relay Providers are affiliated with TSPs; a competing TSP or affiliate of a competing TSP – even if not itself affiliated with a Relay Provider – should not be permitted to control access to such critical databases. Moreover, because a telecommunications service provider may have a wholesale relationship with a Relay Provider, it will be best to simply avoid the possible appearance of conflict that allowing a TSP to manage these databases will create.

After determining the requirements for an NTP database administrator, a request for proposal will need to be developed, issued, collected and evaluated, either by the Commission or by industry, to select the NTP. NeuStar notes that Dash has offered to establish the database required by the GoAmerica proposal within 60 days from April 18.[37] While NeuStar appreciates the enthusiasm exhibited by Dash, there may well be other entities, including possibly NeuStar, that are also interested in being the NTP administrator. If the GoAmerica or CSD proposal is adopted, an RFP process is a necessary step to sort out which parties are both neutral and best capable of managing the required database. Further, the database requires procedures to be developed that assure all providers that they will be treated equally. Conventionally, such procedures are developed from a guideline document prepared by a neutral standards

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[36] *Id.*
[37] Dash Comments at 11.

organization such as ATIS with wide participation of service providers, vendors and others. The required process may make it difficult for the industry to meet a December 31, 2008 timeframe for implementation.

In contrast, if the Commission were to adopt NeuStar's TRU proposal, NeuStar's existing contracts to manage the NPAC could easily be amended to accommodate the addition of the URIs to enable the provision of TNs to IP-based TRS users. As noted in NeuStar's comments, NeuStar can make the necessary NPAC change within 14 days of receiving approval from the NAPM LLC.[38] The required processes to update data in NPAC, and to receive downloads of the database exist, and are adequate for this use. NeuStar also believes that because its proposal supports the use of widely available standards based equipment, the TRS industry should be able to implement the necessary inter-provider signaling and gatekeeper functionality relatively quickly. Adoption of the NeuStar TRU proposal virtually ensures that the new numbering system can be implemented by year-end 2008.

B. Security

As noted above, NeuStar requires that relay users' devices register with a default Relay Provider when turning on so that the Relay Provider can authenticate the user to downstream relay providers and to the PSTN. The method of registration and authentication proposed by NeuStar is identical to that used by VoIP providers to register and authenticate their users. By using this system, NeuStar can better ensure that only authenticated callers are able to communicate through a relay user's firewall.

In contrast, neither GoAmerica nor CSD require such registration and authentication. Instead, they allow unknown parties on the Internet to communicate with relay users. As noted above, CSD even touts this as an advantage of its plan because it allows hearing users to

[38] NeuStar Comments at 13.

communicate directly with a relay user without the intervention of any Relay Provider.[39] This is an invitation to disaster because, in order to receive these calls from an unknown source on the Internet, users under either the GoAmerica plan or the CSD plan would have to leave their firewalls open for any communication from the Internet. This is a vulnerability that must be closed.

The registration and authentication process advocated by NeuStar will also help to mitigate IP-relay fraud. By limiting access to relay providers to only registered users and requiring a credential check (user name/password), casual, anonymous use of IP-relay – the principle enabler of relay fraud – is eliminated.

C. Privacy

A particular concern with the CSD proposal is that it will jeopardize the privacy of relay users. Because, as noted above, CSD's plan allows for communications from unknown sources on the Internet, those sources must be able to query the proposed ONS database to find the IP address of the relay user associated with a telephone number. CSD notes that it expects the ONS database to store the telephone number, default relay provider selection, IP address and street address of every Deaf/HoH user of ONS.[40] Since CSD anticipates that Deaf/HoH to Deaf/HoH calls will be completed direct, device to device, with no Relay Provider assist, that database must be accessible on the public Internet where it will be vulnerable to hackers and data miners, who can obtain the personal data of the Deaf/HoH ONS users, including lists of TNs and current IP addresses of relay users whose firewalls are necessarily open, leaving the user vulnerable to Internet attack and identity theft.

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[39] As NeuStar also noted above, the question of who is eligible for TNs from a Relay Provider is a policy question not related to a particular numbering proposal. NeuStar's TRU plan can certainly accommodate allowing a hearing user to register with a Relay Provider.
[40] CSD Comments at 9 and 24.

CSD urges the Commission to make every effort to emulate what it claims is the openness of the PSTN, which "allows any person, anywhere to determine the phone number of the party they want to call, and to call the individual linked to that number."[41] NeuStar agrees entirely. CSD fails to understand, however, that the PSTN is not an open system. Instead, it is a closed system – albeit a very large one – in which each telephone user subscribes to the local service of a telephone service provider, which, in turn, authenticates its users to other telephone service providers. This is precisely the same as the solution proposed by NeuStar, where relay users register with a default Relay Provider, which in turn authenticates the user to other Relay Providers or to the PSTN. As discussed above, the question of who qualifies to register with a Relay Provider is a policy issue, not a network design issue.

D. Functional Equivalency

An important goal of a numbering system for IP-based TRS must be that the system promotes, as much as possible, functional equivalency with the system used for hearing persons. A major deficiency of the GoAmerica and CSD plans is that they will not allow Deaf/HoH to dial outbound calls using ten-digit TNs in the same manner that hearing persons do. Instead, of simply dialing the ten-digit number, the GoAmerica and CSD proposals advocate that users manipulate their devices in computer-literate ways to place calls. The mechanisms vary depending on what kind of call. To place a call to a hearing person, a GoAmerica or CSD user would type the hostname of a provider, and then supply the telephone number of a hearing user. To call another Deaf/HoH user, a CSD user would enter something like 202.555.1212.ons.tv. Meanwhile, a hearing user direct dialing a deaf/HoH user would simply dial the deaf/HoH users TN, and if they wanted to use an alternate provider, would dial the TN of the provider and enter the number they wished to call.

[41] *Ibid.* at 34.

NeuStar's proposal promotes functional equivalency. Deaf/HoH users wishing to reach a hearing user using their default Relay Provider simply dial the TN of the person to whom they wish to connect. If they wish to use an alternate provider, they dial the TN of the alternate provider and enter the number they wish to call. If they wish to call another deaf/HoH user, they should dial the TN of that user. This is particularly true with emergency calls – when a Deaf/HoH relay user needs emergency help, they should simply be able to dial 9-1-1. This capability is standards based, and standards compliant devices should be able to use TRU to dial anyone just as a hearing person can.

V. CONCLUSION

NeuStar continues to believe that its proposal to use the NPAC as the central database for a system of providing NANP TNs for use with IP-based TRS best serves the needs of Deaf/HoH users. NeuStar's TRU plan provides the highest degree of functional equivalency, security and privacy. It also enables tremendously increased E9-1-1 capability for Deaf/HoH users in need of emergency assistance. Only NeuStar's TRU proposal can be implemented by December 31, 2008. In fact, NeuStar believes that its system can be up and running well in advance of that date.

For the reasons stated above, NeuStar urges the Commission to adopt its Telephone numbers for Relay Users proposal.

Respectfully submitted,
NeuStar, Inc.

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FILED/ACCEPTED
APR 21 2008
Federal Communications Commission
Office of the Secretary

William Caton

From: Fruchterman, Rich [rich.fruchterman@neustar.biz]
Sent: Monday, April 21, 2008 9:39 AM
To: William Caton
Subject: FW: ECFS Failure on Friday, April 18th
Attachments: NSR 03-123 Reply Comments.pdf; App Error 2.pdf; Network Error.pdf

Bill,

The ECFS help desk told me that I need to talk to you. Attached is a set of reply comments that I tried to file using ECFS on Friday night. Unfortunately, even though I tried several different computers, two different networks and two different browsers, I could not get the comments into the ECFS system. Instead, while experiencing long network delays throughout, I repeatedly got one of two error messages, the first saying that a network error had occurred and the second saying that Proceeding 03-123 is not open for submissions through ECFS. Representative copies of those error messages are attached. Below is the message that I sent to the ECFS Help Desk and to the Secretary at 11:45 pm, including both the reply comments and the error messages as attachments.

Please advise me on how to proceed so that these reply comments can be reflected as timely filed.

Thank you.

Rich Fruchterman
NeuStar, Inc.
Regulatory and Public Policy Counsel
202.533.2917
202.256.1442

From: Fruchterman, Rich
Sent: Friday, April 18, 2008 11:45 PM
To: 'ecfshelp@fcc.gov'
Cc: 'Marlene.Dortch@fcc.gov'
Subject: ECFS Failure on Friday, April 18th

I have been trying since around 8 pm this evening, April 18, 2008, to submit Reply Comments in CG Docket 03-123 using the Electronic Comments Filing System ("ECFS"). Unfortunately, ECFS does not seem to be functioning properly. I have been experiencing long network delays and getting one of two error messages. One says that there is a network error and the other says the Proceeding 03-123 is not open for submissions through ECFS. I know that the latter cannot be true because I have made electronic filings in that proceeding in the past and a can see Reply Comments that others have filed.

Please advise on how to proceed.

Federal Communications Commission

Application Error(s)

Proceeding 03-123 is not open for submission to ECFS.

Press the back button on your browser to return to the form and make the necessary corrections.

Return to the ECFS Home Page

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