Before the
Federal Communications Commission
Washington D.C. 20554

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

COMMENTS OF CSDVRS, LLC AND COMMUNICATIONS SERVICE FOR THE DEAF ON ASSIGNING INTERNET PROTOCOL-BASED TELECOMMUNICATIONS RELAY SERVICE USERS TEN-DIGIT TELEPHONE NUMBERS LINKED TO THE NORTH AMERICAN NUMBERING PLAN

Ben Soukup, CEO
Communication Service for the Deaf
Network
102 North Krohn Place
Sioux Falls, SD 57103
605-367-5760

Sean Belanger, CEO
William Cobb, VP,
Engineering and Operations
CSDVRS, LLC
600 Cleveland Street
Suite 1000
Clearwater, FL 33755

Of Counsel:

Karen Peltz Strauss
KPS Consulting
3508 Albemarle Street, NW
Washington, D.C. 20008
202-363-1263
kpsconsulting@starpower.net

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SUMMARY

CSDVRS, LLC and CSD propose that the Federal Communications Commission (FCC) adopt the One Numbering System VoIP (ONS) as its global, ten-digit telephone numbering system for all Internet protocol (IP)-based relay services, including video relay services (VRS). By mirroring to the extent possible what hearing users have over both the public switched telephone network (PSTN) and voice over Internet Protocol (VoIP) networks, the ONS will provide secure numbering for individuals who are deaf and hard of hearing for both routine and E9-1-1 calling. In addition to enabling accurate and reliable correlation between telephone numbers (TNs) and Internet Protocol (IP) addresses, the ONS will correlate physical address information of an Internet-based relay user to the user's TN to support E9-1-1 calls that are handled by relay providers. The ONS will allow this information to be securely accessed during the call setup process to support the goal of functional equivalence.

There are numerous benefits that will result from adoption of the ONS as the Internet-based relay numbering system. Most significantly, this system will provide deaf and hard of hearing relay users with a "one stop shop" for ten-digit phone numbers that can be dialed through either the public switched telephone network (PSTN) or VoIP networks. The relay user will control and manage his or her own information in the ONS database through a password protected system. In this manner and by using a third

party entity that is independent of any one relay provider, the ONS system will create a level playing field for all relay providers to competitively serve individuals who are deaf and hard of hearing. This will prevent potential conflicts of interests and foster open competition in the relay services market.

Just as, if not more important, the ONS is the only numbering system that will allow full and open access between and among video communication users, regardless of relay provider. More specifically, only under the ONS will any individual – deaf, hard of hearing or hearing – be able to use North American Numbering Plan (NANP) telephone numbers issued by the ONS for making relay or point-to-point calls, whether or not that individual is eligible to acquire a device from a relay service provider. Under the other proposals, individuals who are not tied to a provider will not be able to effectively use the uniform numbering system to achieve direct or relay communication with other deaf and hard of hearing individuals. In addition, because other numbering proposals link together the TN and a videophone device, every relay provider that supplies a TN and device to consumers under those systems will be able to track *all* relay and point-to-point calls made by individuals who are deaf or hard of hearing, whether or not those individuals are using the services of the provider from whom they have secured their telephone numbers, and even after those individuals have requested that their numbers be ported to a new provider (for as long as those individuals keep their original videophone devices).

The ONS is designed to support multiple communication methods and protocols and endpoint hardware – both those that exist today and those that are expected to evolve as the VRS industry continually strives to achieve true functional equivalence for relay users in the future. Such ongoing support will ensure that relay users are able to enjoy the latest innovations in video telephony hardware and software, as is required by the Communications Act.

Another advantage of the ONS is that it, compared to the other proposals, will reduce the costs of a uniform numbering system through economies of scale. Because there will be a single telephone number database, rather than ten to fifteen individual databases operated and maintained by individual VRS and IP relay providers who would have to unnecessarily duplicate this functionality, funding for the central numbering system will be equally shared across all providers, thus creating savings for the Interstate TRS Fund. In addition, a single sourced numbering operation will promote consistency in methodology and service quality: the relay user and provider community, as well as the FCC, will have assurances that the single database will always be up-to-date, as compared to multiple databases, which could fall behind or become unavailable depending on individual relay provider circumstances. The ONS will also significantly improve safety and emergency communications for people who are deaf and hard of hearing by having a single E9-1-1 positioning system that is always available to all relay providers. Moreover, a single E9-1-1 system will be much more cost effective

to implement than ten to fifteen individual systems, and far easier to upgrade to meet evolving NG

9-1-1 requirements.

Finally, precisely because there will be only one database operated by a centralized numbering entity, the user information contained therein will be more secure, as it will only be accessible by certified providers through encrypted connections. All database queries and modifications will be easy logged and tracked through a single system, allowing fraudulent activity, such as the unauthorized use of relay services (as has occurred in the case of IP relay), to be more easily investigated and resolved. Similarly, the likelihood of a customer being "slammed," or being assigned to a relay service provider without providing consent, will be reduced if a neutral party is responsible for the assignment, administration, portability and reclamation of local ten-digit numbers.

In summary, the ONS offers a secure, functionally equivalent numbering system using mainstream VoIP networking, that will allow deaf and hard of hearing relay users to easily acquire telephone numbers, manage those numbers and location address information, choose or change relay providers as desired, and enjoy the same level of privacy that is experienced by users on the voice telephone network. ONS overall objectives and attributes are as follows:

1. To provide individuals who are deaf and hard of hearing with a straightforward method to acquire a ten-digit telephone number

(TN), choose their preferred relay provider, and update the numbering database on a real-time basis;

2. To create a method for keeping TNs and IP addresses synchronized and accurate, up to the minute, for relay and point-to-point calls;

3. To create a method for reaching deaf and hard of hearing individuals via all types of relay and point-to-point calls;

4. To facilitate and support telephone number portability;

5. To provide a secure database system for relay service providers to obtain routing information;

6. To level the playing field for all providers by using an independent third party that will operate an open and centralized numbering system;

7. To support and facilitate the transition to new communication protocols (e.g. SIP), software and hardware and to foster the development of new relay innovations;

8. To operate an E9-1-1 positioning and transport service for all relay providers;

9. To achieve economies of scale and other efficiencies through the operation of a single system;

10. To provide support for fraud mitigation programs for relay service providers; and

11. To provide consumers who are deaf and hard of hearing with the highest possible security without compromising these consumers' ability to receive all types of calls.

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COMMENTS OF CSDVRS, LLC
AND COMMUNICATION SERVICE FOR THE DEAF

I. Introduction and Background

CSDVRS, LLC (CSDVRS) and Communication Service for the Deaf (CSD) submit these comments in response to the FCC's Public Notice seeking to refresh the record on assigning Internet Protocol (IP)-based telecommunications relay service (TRS) user's ten-digit telephone numbers linked to the North American Numbering Plan (NANP).[1] CSDVRS, LLC has been certified to provide video relay services (VRS) throughout the United States since September 2007. Before that time, and beginning around January 2007, CSDVRS provided VRS through other providers that were either certified or authorized to provide VRS through their interstate common carrier status. CSD is a private, non-profit organization that provides programs and services intended to increase communication, independence, productivity, and self-sufficiency for all individuals who are

[1] FCC Public Notice, DA 08-607 (March 19, 2008).

deaf and hard of hearing through education, counseling, training, and communication assistance. CSD provides TRS, including IP relay services, in over thirty states as a subcontractor or directly through its own TRS operations-calls centers.

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. As the FCC is aware, although individuals who use other types of voice over Internet protocol communication services (VoIP services) already have ten-digit numbers that are linked to the NANP, at present, there is no similar uniform numbering system for IP-based relay users. The lack of ten-digit local numbers has created considerable hardships for relay users that have prevented IP-based relay services from achieving true functional equivalency. First, the dynamic nature of Internet addresses has made receiving calls from hearing individuals through these services difficult, and sometimes impossible. While static IP addresses are sometimes an alternative, these add costs for their owners, and are not always available to residential users. In addition, while some providers have created unique identifiers for their relay users, these identifiers vary from provider to provider, making it complicated and confusing to complete a relay call to a deaf and hard of hearing individual. Currently, the unique identifiers (faux numbers) only work with devices in individual provider networks. This has

resulted in closed numbering systems intended to create barriers to using the networks of competing relay providers.

In order to initiate efforts toward the creation of a uniform numbering system, on November 30, 2005 and on January 24, 2006, CSD requested the North American Numbering Council (NANC) for assistance in achieving dialing uniformity by VRS users. The presentations made on those dates set in motion research by the Industry Numbering Committee (INC) of the Alliance for Telecommunications Industry Solutions (ATIS) into the feasibility of several uniform numbering solutions. CSDVRS contributed a presentation to the INC, in May 2007, outlining several of the operational elements of the centralized, third party numbering system described in these comments. Other providers also made contributions describing similar operational elements. Industry and consumer interest in these issues, in turn, prompted the FCC to explore the creation of a global numbering system in a notice of proposed rulemaking accompanying its 2006 Interoperability Order.[2] We applaud the Commission for now seeking to refresh the record in this proceeding, and for its recent commitment to holding a stakeholder workshop and to adopting a ten-digit numbering plan in the second quarter of this year, which will be implemented by the end of this year.

[2] *In the Matter of Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, CG Dkt. 03-123, FCC 06-57 (May 9, 2006) at ¶¶44-50.

In order for VRS and IP relay to be functionally equivalent to voice telephone services, relay users need to be able to call each other and be called (using any relay provider or via point-to-point) to the same extent that PSTN and VoIP users can identify and contact one another. A uniform numbering system will not only enable deaf and hard of hearing individuals to maintain critical contact with family members, friends, colleagues, businesses, and healthcare resources; it will also allow deaf and hard of hearing people to complete job applications, on-line reservations, credit card applications and other forms, without having to include additional and confusing information about relay services.

Any numbering system adopted by the FCC must allow the following four possible calling scenarios:

1. Deaf or hard of hearing caller to hearing caller: The deaf or hard of hearing caller chooses a relay provider via the URL of the provider;

2. Hearing caller to deaf or hard of hearing caller: The deaf or hard of hearing caller chooses the relay provider by designating the provider to receive calls made to the caller's telephone number;

3. Deaf or hard of hearing caller to deaf or hard of hearing caller: Direct point-to-point communication between deaf and hard of hearing users is enabled through an open Internet addressing system that is independent of relay providers; and

4. Hearing caller fluent in ASL (e.g. hearing parents or siblings) to deaf and hard of hearing caller: Direct point-to-point communication between the users is enabled through an open Internet addressing system that is independent of relay providers.

A consistent and uniform numbering solution is also needed for the handling of emergency IP relay and video relay service (VRS) calls, per

the FCC's recent Report and Order directing Internet-based relay service providers to handle emergency calls.[3] In order to ensure that the FCC's recent E9-1-1 relay ruling achieves true functional equivalency, public safety answering point (PSAP) and other local emergency authority personnel will need to be able to return calls to individuals when incoming calls are disconnected, to the same extent that the FCC already requires this of all interconnected VoIP providers.[4] Personal ten-digit local telephone numbers will enable relay users to have integrated E9-1-1 support that will provide primary location information, emergency assistance, and enable callbacks from local emergency authorities. More specifically, by integrating VRS and IP relay services into the NANP, a user's IP address will be able to be matched to his or her registered location and be connected to the appropriate PSAP, using the same PSAP systems and procedures that VoIP networks use today. If and when the PSAP needs to call back an emergency caller, the PSAP personnel will be able to use the same standard protocols that are used to call back people using voice telephones. This will not only achieve functional equivalence; it will save lives because specialized procedures will not be needed for

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[3] *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 Dkt. No. 03-123, WC Dkt No. 05-196, FCC 08-78 (March 19, 2008).

[4] The FCC established this requirement for VoIP providers in *IP-Enabled Services, E911 Requirements for IP-Enabled Service Providers*, First Report and Order and Notice of Proposed Rulemaking, WC Dockets No. 04-36, 05-196, FCC 05-116 (June 3, 2005).

calling back people who are deaf and hard of hearing. Having a centralized common E9-1-1 system will also enhance the overall availability of E9-1-1 services during severe emergency situations (e.g. large fires, severe weather or major disasters) because relay users who are deaf or hard of hearing will be able to use any relay provider, not just the relay provider that issued their TNs.

A single neutral party, rather than VRS providers, should have primary responsibility for assigning and distributing ten-digit local numbers directly to relay users. It is inappropriate to continue the current practice of having VRS providers distribute their own numbers to VRS consumers because this has impeded the ability of VRS users to receive seamless and transparent telephone service – and therefore truly functionally equivalent communications.

Moreover, as will be more fully discussed below, allowing individual relay providers to tie the distribution of TNs to their own video equipment is likely to be harmful to competition and in direct conflict with FCC's orders to increase interoperability. This is because if each individual relay provider is permitted to assign ten-digit numbers for their customers, two things will occur: first, all inbound and outbound traffic to those customers will default to and require routing through that provider, and second, individuals who have not signed up their video devices with a provider (e.g., hearing persons

as well as deaf individuals who have multiple devices) will not be able to use the uniform numbering system for those independent devices.

As will be shown below, a centralized, unified numbering system will provide a level playing field for all providers to competitively serve deaf and hard of hearing relay users, facilitate access to numbers and the ability to change relay service providers, and facilitate number reclamation and reuse. In addition, because the numbering and addressing system would be the same industry-wide, the research and development of advanced relay innovations and protocols and their subsequent deployment would be better enabled. Finally, a centralized system will promote economies of scale and equitable cost sharing across relay providers, facilitate numbering portability, reduce relay misuse and slamming practices, and promote greater security and privacy of user information and user calling patterns.

II. Overview of the One Numbering System

CSDVRS and CSD are proposing that the FCC adopt a common numbering system, which we have termed the "One Numbering VoIP System," (ONS), for the acquisition and management of telephone numbers, IP addresses used by individuals who are deaf and hard of hearing, and primary location information for deaf and hard of hearing individuals and relay service providers (See Figure 1 – ONS Structure).[5] The goal of this

[5] These comments are being submitted in two forms. This version of the comments separates the text from the figures, the latter of which are

neutral, centralized system is to provide deaf and hard of hearing relay users with the highest level of functional equivalence, while leveraging the protocols and methods used by existing telephone (PSTN, wireless and VoIP) and E9-1-1 systems. The ONS VoIP system will have the responsibility of operating and maintaining a redundant, always available system, 24x7, to reliably correlate the deaf and hard of hearing users' TNs to their locations, both geographic and on the Internet. More specifically, the ONS VoIP organization will perform several significant tasks, including:

a. Operating, managing and maintaining the TN registration system

b. Operating and maintaining the ONS DNS for VRS.TV domain 24x7 (to support the xxx-yyy-zzzz.VRS.TV and xxx-yyy-zzzz@VRS.TV addressing scheme)

c. Procuring, distributing and supporting the ONSM hardware and software

d. Managing, operating and maintaining the TN database

e. Managing, operating and maintaining a secure relay service provider access system to the TN database

f. Conducting research and development on enhancements of the TN system to support continuous improvements in relay service capabilities

g. Establishing standards for secure access to the database by deaf and hard of hearing users

h. Establishing certification standards and methodologies for relay service providers (TRS, IP, and VRS) to access and

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contained in an Appendix to the text. The second version integrates all figures with the comment text.

query the TN database

i. Providing 24x7 customer support for the ONS VoIP system and ONSM hardware and software

j. Operating and maintaining the ONS VoIP network 24x7

k. Publishing interconnect requirements for service providers to connect to the ONS VoIP network for the termination of in-bound PSTN calls

l. Operating, managing and maintaining the E9-1-1 positioning and support system

In addition to obtaining, distributing and managing TNs provided to deaf and hard of hearing relay users, the ONS VoIP system will support number portability, allowing users to select or change their relay service provider through the ONS entity. By eliminating the need for each and every relay provider to develop its own numbering database, the common numbering and IP address methodology will allow these providers to focus their efforts on developing advanced calling features and products to continually improve communication for deaf and hard of hearing relay users.

The ONS VoIP system will be operated, managed, and supported by a neutral third party entity that is independent of relay service providers in order to prevent any conflicts of interests and foster open competition in the relay services market. The organization will be chosen through an RFP process and can be funded through a nominal surcharge on the per minute reimbursement rate for relay providers that will minimally reduce the reimbursement rate received by relay service providers from the Interstate

TRS Fund. This surcharge should be determined through the same cost review process that is used for setting the TRS reimbursement rate and be modified during the same timeframe that the TRS reimbursement rate is established, to allow relay providers to factor the surcharge into the business planning process. Funding the ONS in this manner will be the most equitable for relay providers, regardless of their size, in that the costs will be shared proportionally, depending on each provider's market share. A significant advantage of the ONS is that it will obviate the need for relay providers to build their own address correlation and E9-1-1 positioning system, as well as pay for the costs of having to interface that system to a centralized database and keep that database updated in a timely manner (to provide all TRS providers with updated address correlation and physical location information required for the handling of E9-1-1 calls).

In conjunction with and subject to the approval of the FCC, the ONS will establish open standards, methodologies and certification requirements (approved and overseen by the FCC) for relay service providers and CPE equipment to gain access to the TN information database during call setup and E9-1-1 situations. These standards will be carefully and strictly designed only to allow access by authorized entities that have met a detailed set of conditions and specifications. The ONS will also develop methods – again in coordination with and subject to the oversight of the FCC – to provide deaf and hard of hearing users secure access to their records in the

ONS database. This will ensure that on an ongoing basis, relay service providers will receive accurate IP address, physical location data and service capability information to allow the correct termination and routing of all calls.

The governance of the ONS should include a board consisting of representatives from the FCC, Interstate TRS Fund Administrator, associations representing people who are deaf and hard of hearing, IP relay and VRS providers, and state relay administrators to insure that the ONS is responsive to the needs of its various constituents and stakeholders. One of the major advantages of the ONS system is that it is designed to support the evolution of new relay technologies and systems (hardware, software and network) to enhance and expand communication options for deaf and hard of hearing users. Having consumers on the governing board of the ONS will ensure their active role in the development and deployment of such technologies.

While the initial system structure of the ONS will require the deployment of additional inexpensive software or hardware to the relay user location (both of which already exist in the marketplace and can be readily obtained), over time, all end user equipment will contain the necessary components to automatically interact with the ONS system. Whether software or hardware is needed on this interim basis will depend on the equipment at the user's location; however, the vast majority of current IP-

based relay users will merely need software. CSDVRS has already had considerable experience with the installation of these modules; to date, thousands of our customers have installed these applications. Prior practice has also confirmed the process to be quite simple and the time needed to install either the software or hardware application to be exceedingly minimal.

The ONS' existence is predicated on providing a common system to be used by both deaf and hard of hearing users and relay service providers. Having a single, neutral system will provide a level playing field for all relay providers to competitively serve the relay market and will provide the relay user who is deaf or hard of hearing with choice and unconstrained access when selecting a relay provider to receive calls from a hearing person and when making relay or point-to-point calls.

III. The Benefits and Attributes of ONS

A. The ONS Will Provide People who are Deaf and Hard of Hearing with a Method to Acquire a Ten-Digit Telephone Number and Choose a Relay Provider

1. Acquiring a Ten-Digit Number

The ONS will provide deaf and hard of hearing individuals with a TN from the NANP that hearing friends, family, colleagues, businesses and healthcare resources will use to contact them. (See Figure 2, Acquisition of Telephone Numbers). The number will be a geographically relevant number

for the relay user and used in the same manner as voice telephone customers use TNs. The ONS will acquire TN number blocks from wholesale carriers (e.g. Level 3, Global Crossing, etc.) and the major local exchange carriers (LECs), such as AT&T, Verizon, Qwest, Embark or Frontier, for this purpose. CSDVRS proposes that the ONS be the entity to actually distribute TNs to relay users; however, relay providers could also assist users in filling out forms to apply for and acquire these numbers if that is the preference of consumers.

In order to acquire a telephone number, each deaf and hard of hearing relay user will register with the ONS, either on-line via the web, in person, via TRS, VRS, TTY, IP relay, email, fax or by standard mail. The individual will provide his or her name, location information, email address and designated relay provider to answer calls from hearing people. The ONS will check the ONS number database for a relevant ten-digit number. If it has a correct number, it will be issued; otherwise the ONS will order a number or block of numbers from the appropriate wholesale carrier or LEC.

The ONS structure will also support a deaf or hard of hearing user having multiple TNs, each potentially having specific IP addresses and location information. This is analogous to a hearing user having work, home and cell phone numbers, all used in different situations. This will also ensure that relay service providers will receive accurate IP address and service capability information for the correct routing of relay and emergency calls at

all times, regardless of where the user is located. The deaf or hard of hearing user will also be allowed to register a work number provided by an employer in the ONS system and have it correlate to a videophone or videophone software client at the business location, provided the business entity allows the work number to be forwarded to the selected VRS provider.

Additionally, the deaf user will be able to register his or her TN(s) in the national "Do Not Call" registry to prevent unwanted telephone solicitations.

2. Handling Calls Through the ONS VoIP Network using ENUM

The ONS will operate a VoIP network (much in the same way that VoIP providers, such as Vonage, now operate VoIP networks) to support the termination of the TN calls at the designated relay provider. The relay providers will be interconnected to the ONS VoIP network for call termination.

ONS will employ a T**E**lephony **NU**mber **M**apping (ENUM) system to route the calls. This system was developed by the IETF (Internet Engineering Task Force), the group that develops standards for the Internet. ENUM is a methodology for finding the called party on the Internet when only the telephone number of the called party is known. In conjunction with Domain Name Service (DNS) and Session Initiation Protocol (SIP), ENUM will enable the completion of calls from a hearing person to a relay user who is deaf or hard of hearing, as well as point-to-point calls between two deaf

and hard of hearing individuals or point-to-point calls between a hearing caller fluent in ASL and a deaf or hard of hearing individual, because it can resolve the IP address of the deaf or hard of hearing individual from the dialed TN. The processing of an in-bound call from the PSTN will vary depending on how the relay provider is connected to the ONS VoIP network. The ONS system uses ENUM, DNS and SIP functionality to meet current requirements because the technology is scalable and expandable to meet the evolving needs of the deaf and hard of hearing community.

B. Only the ONS Will Enable Any Individual to Utilize Uniform Numbering Independent of a Provider's Video Equipment

One of the most significant benefits of the ONS is that it will allow the uniform numbering system to be independent of relay providers. Historically, the dominant relay provider has imposed significant limitations on the distribution of its video devices. Only applicants who have a hearing loss and use sign language are permitted to acquire a single device; multiple devices in one household are not permitted. In addition, unlike mainstream telephone companies, many of which sell the same telephone equipment that can be used by multiple service providers, the dominant relay provider has not permitted competitive relay providers to distribute its video devices to relay consumers who are not patronizing the dominant carrier's services.

There have been significant and adverse consequences associated with these limited equipment distribution practices. First, because video phones have typically been distributed only to people with hearing loss, hearing

people have not been allowed to acquire one of these devices from providers. As a result, hearing relatives and friends who are able to sign cannot call their deaf family and friends directly, and must instead use video relay, significantly impeding their ability to have direct communication and driving up costs to the Interstate Relay Fund. In addition, because only one videophone per household is permitted, even deaf and hard of hearing consumers often find themselves being limited to communicating in only one room of their homes. This means having to climb and descend stairs on a regular basis just to make or answer a phone call, a scenario that hearing people using the voice telephone network would, at best, find absurd. In an emergency situation, or in the case of individuals with multiple disabilities, these restrictions create more than an inconvenience; they create dangers for the individuals in question, leaving them vulnerable when they are not able to reach their single videophone. For example, the ability to make or receive a call could become impossible and even life-threatening if an emergency exists in a room other than where the permitted device is located.

Under all of the numbering proposals except for the ONS, the scenarios described above – wherein users will be tied to the closed network systems of individual providers – will be perpetuated. This is because under the other proposals that have been presented to the FCC, individuals who wish to make and receive relay or point-to-point video calls will be forced to acquire a device that is either distributed by or approved by a VRS provider

in order to use the numbering system. The following scenario will help to illustrate this point:

> Joe, a hearing individual who signs and has a deaf brother, is ineligible to receive a videophone from any of the providers because he is hearing. Because Joe cannot get a videophone, he cannot get a NANP number to use for VRS or point-to-point calls. (Joe's brother does have a TN from a VRS provider that is linked to a videophone.) Joe decides to go out and purchase his own video software or equipment from a retail store, hoping that he can call his brother with it. But because the device that he acquires is not linked to a VRS provider, Joe is unable to dial his brother's ten-digit number via the Internet to talk to him directly (point-to-point); indeed, the only way he can call his brother directly is by dialing his IP address. But it is quite difficult to do this because IP addresses are dynamic and acquiring a static IP address is expensive and not always available. Similarly, when Joe wants his brother to call him, his brother must try to figure out Joe's IP address; again, his brother cannot dial Joe's TN because Joe has not received a provider's video phone that carries with it a TN.[6] Stated otherwise, his brother cannot reach him because only a provider's network can query the database that correlates IP addresses and TNs, and that provider's network is closed to Joe. Left without much option, Joe continues to communicate with his brother via VRS, imposing greater costs on the Interstate TRS Fund, which are then passed along to the general public. The beneficiaries of this arrangement end up being the largest relay providers, who will benefit from greater VRS usage. The losers are Joe and his brother who cannot communicate directly via video over the Internet.

Note that in the above scenario, Joe *would* have been able to call his brother's TN if he had originated the call over the PSTN from a voice telephone phone. However, he cannot dial the TN if he wants to originate the call to use sign language over the Internet via a videophone that is not tied to a provider. This is because the call would have to go through the central

[6] It is assumed that if the ONS distributes TNs to hearing people not covered under the relay provisions (Title IV) of the Americans with Disabilities Act, it could do so for a nominal monthly fee that would cover the operational cost of the TN.

database to be completed, and the only access to that database under the other proposals is through a provider. By contrast, under the ONS proposal, Joe and his brother would be able to call each other using NANP-based telephone numbers either directly or via relay because Joe would simply have to apply to the ONS for a telephone number, which would not be tied to any provider's equipment. This is because the ONS is the only numbering system that has been proposed that will allow full and open access between and among video communication users using uniform NANP numbers, regardless of relay provider or videophone device used.[7] Only under this system will any individual – deaf, hard of hearing or hearing – be able to obtain a TN for relay or point-to-point calls, whether or not that individual is eligible to acquire a device from a relay service provider.

C. Other Numbering Plans Will Allow Tracking of Calls by the Relay Service Provider that Supplies the Number and Videophone Device

Precisely because other numbering proposals presented to the FCC will link together the TN and a videophone device, under these other proposals, every relay provider that supplies a phone number and videophone device to a consumer will be capable of tracking all of that consumer's calls. The reason for this is that all calls under these systems will have to be routed through the gatekeeper/registrar servers of the providers who have

[7] The problems discussed in this section pertain only to VRS because of its current dependence on H.323 technology. By contrast, IP relay services rely on SIP based information technologies.

distributed the numbers. It is important to note that such tracking can, and given the highly competitive industry that VRS has proven itself to be, will likely occur, for *all* relay and point-to-point calls made by individuals who are deaf or hard of hearing, whether or not such individuals are using the services of the provider from whom they have secured the number (and videophone). For example, if a consumer has secured a telephone number from Provider A, Provider A will know when that consumer makes calls not only through Provider A, but through Providers B, C, and D as well. Even worse, Provider A will also know when that consumer makes point-to-point calls to deaf friends, relatives and colleagues, even though that consumer will not even be using any relay services at all to make those calls. The potential for unauthorized call tracking in these scenarios is unprecedented in telecommunications law. While, of course, PSTN-based telephone companies do have knowledge of telephone calls placed over their own networks for billing and other administrative purposes, never have these companies had the right to track calls made over the networks of their competitors; nor have the manufacturers of telephone equipment ever had the ability or the right to track calls by customers who have purchased their products. Such call tracking by VRS providers would be an invasion of consumer privacy, and if allowed to take place, would constitute a discriminatory practice that would unfairly single out deaf and hard of hearing Internet-based relay users.

In addition to the problems of having all calls tracked by the provider that has distributed a consumer's number and videophone, under the other numbering proposals, deaf and hard of hearing relay consumers may continue to have their calls tracked even after they have changed providers. This is because these consumers' numbers will continue to be linked to the videophone devices that remain registered with the original service provider network. Only that relay service provider's network will be capable of making a query to the central database to obtain the IP location information and instructions on how to route the calls to and from those numbers. While the central database will be changed to reflect which relay service provider should answer the consumer's incoming calls from the PSTN, the record indicating which provider must be queried for the IP address of the device being called *will not* change because the devices supplied to the deaf or hard of hearing relay users will only function on the specific provider's network that supplied those devices. The *only* way for an individual who is deaf or hard of hearing to completely change to a new vendor would be to give up the old device and get a new device from a new provider. If this is not done, all of the calls made by that individual – again whether VRS or point-to-point – will continue to be routed through and could be tracked by the original provider – even after that person has changed to a different provider.

D. The ONS Will Provide a Method for Keeping the Telephone Number and IP Address of Relay Users Updated and Secure

The ONS Domain Name Service will reliably determine the user's IP address from the user's TN for both routine and emergency relay calls. The TN is provided as part of the call information received by the relay provider from the PSTN. The IP addresses for the deaf and hard of hearing relay users TN can be: "xxx-yyy-zzzz.VRS.TV" (for H.323) and "xxx-yyy-zzzz@VRS.TV" (for SIP), where "xxx-yyy-zzzz" is the ten-digit TN. The "current address" scheme and ONS platform also provides individuals who are deaf and hard of hearing with a common system for reaching other individuals who are deaf and hard of hearing for point-to-point calls. The system is designed to support both current address methods used by legacy videophone and software clients using H.323 signaling, as well as future devices using SIP. The system also will be designed to have the capability to support future signaling and addressing technologies (e.g. IPv6).

To achieve this, the ONS will require installation, at the user location, of a "One Number Service Module" (ONSM) in order to maintain a real time correlation of the IP address and URL (xxx.yyy.zzzz.VRS.TV and xxx.yyy.zzzz@VRS.TV) to the TN. It is likely that most users will be able to add software to achieve the necessary correlation. The hardware, if needed, will be a small and inexpensive router appliance. The appliance or application will periodically contact the ONS DNS to update the current IP address of the deaf and hard of hearing user. This is the key process that will

keep the deaf or hard of hearing user's IP address constantly correlated with the TN and primary address location.

There are three possible versions of the ONSM: One is an inexpensive software application on a PC connected to the same LAN as the videophone, that is designed to be a "heartbeat" application device that will periodically "phone home" to the ONS DNS to update the deaf or hard of hearing user's IP address in the ONS database. (Figure 4 – ONMS Application in a Router Configuration). This can be used if the deaf or hard of hearing relay user already has a router installed on the home or small business LAN. It is likely that the vast majority of relay users will be able to add this simple software to achieve the necessary correlation. CSDVRS estimates, based on its prior experience in distributing 800 personal TNs, that 80+% of current IP-based relay users will merely need software, the cost of which has previously been included as part of the overall costs of installing and utilizing a dynamic DNS system.[8] CSDVRS' experience is that a consumer can easily download and install this software, without any disruption to the user's relay service. The software install guide is one page and the installation process is 5 simple steps. CSDVRS successfully has deployed several thousand personal 800 numbers using this software, and operational experience has shown that the vast majority of users can install and configure the software on their own. A trained customer services

[8] Even if this cost were to be separated out, it would not exceed $0.50 per device.

representative can easily resolve any issues or questions that arise in connection with the installation.

The second version is a consumer router (hardware appliance) with four (4) LAN ports and an embedded "heartbeat" application that, like the software, will regularly "phone home" to the ONS DNS (Figure 5 - ONSM Appliance in a Hub Configuration). Any changes in the user's IP address will cause the user's TN record to be updated. The hardware, if needed, will be small (small enough to fit in a person's hand) and cost approximately $17.00 per device.

In a third version, the ONSM is a appliance that is again designed to be a "heartbeat" application device. This can be used if the deaf or hard of hearing user already has a router installed on the home or small business LAN. This is used in situations where the user does not or cannot install the ONSM software on a computer attached to the LAN (Figure 6-ONSM Software in User PC Configuration).

ONSM hardware and software are designed to require minimal configuration by the user. The ONS can ship the appliance or software directly to the user for self-installation and either appliance will be managed by a central support entity in the ONS that operates 24X7 to allow support, configuration and application updates to be done remotely without interaction by the user. Software updates for the ONSM hardware

appliances and PC applications would be distributed electronically and would be structured to update automatically or at the permission of the user.

E. The ONS Will Facilitate Reaching Deaf and Hard of Hearing Individuals Via Relay Services

Once a deaf and hard of hearing relay user has registered into the ONS VoIP system and installed either the ONSM software application or hardware appliance at their location, the ONS system will automatically and continuously update the IP address of the user videophone to their TN by periodically "phoning home" to the ONS DNS with its current IP address. Each ONSM or PC application will have a unique address that, in combination with the IP address, can be used to identify the deaf and hard of hearing user in the TN database. Any changes in the IP address will immediately be reflected in the ONS database. This system will support both static and nomadic users. A nomadic user is one that travels frequently or is required to be or work at multiple locations. When the user travels, the ONSM software can reside on the user's portable laptop and automatically "phone home" when plugged into the Internet.

The ONS system will be the "authoritative" DNS server for the VRS.TV domain and will be consulted for IP address resolution on all connection requests made to devices using the xxx-yyy-zzzz.VRS.TV and xxx-yyy-zzzz@VRS.TV addressing scheme. The service will support both relay and point-to-point calls made using the current communication protocol – H.323. In the case of a hearing caller trying to reach a person who is deaf or

hard of hearing, the TN of the called individual will be presented automatically via the dial number identification service (DNIS, i.e., the number being called) feature to the communications assistant (CA) or video interpreter (VI) (Figure 7 – VRS Call to Person who is Deaf or Hard of Hearing with 321.555.1212 (TN)). The CA or VI will append ".VRS.TV" to the TN and establish a connection to the called deaf or hard of hearing user (the act of appending this address can be automated by relay providers).

A point-to-point call between two deaf and hard of hearing users will be completed using the xxx-yyy-zzzz.VRS.TV address scheme (Figure 8 - Point-to-Point Call with 321.555.1212 (TN)). When the deaf or hard of hearing user attempts a direct connection to the address of another deaf or hard of hearing user, the address of the called individual will be resolved to his or her current IP address in the ONS DNS.

F. Relay Users will Be Able to Easily Update Information in the ONS

In order to ensure users secure access to manage their TN records, appropriate verification systems will be developed to authorize access to and modification of the TN record. The ONS will develop a set of policies and procedures for consumers to create, add, change or delete their TN records. This will include a password protected system that will provide deaf or hard of hearing relay users with a user name and password as part of the registration process, and which consumers will use to easily change and update all fields of their TN records and, under appropriate circumstances, to

have the TN changed or removed. The ONS will also have a customer service organization to support consumers seeking to make any changes to their TN records. While, in all likelihood, most changes made by users will involve modifications to the primary address location, users may need access to their records when they move a sufficient distance to make their number no longer geographically relevant, when they experience life events (e.g., marriage, divorce or death) or for safety reasons (e.g. harassing phone calls). Various access methods for all account creation, modification and deletion action will be supported through individual or a combination of the following methods: Web-based access via the Internet, VRS, TRS calls to a customer service person, direct video point-to-point call to an ASL literate customer service person, TTY and IP relay to customer service, email, fax and standard mail. The TN record will be considered personal property of the person requesting the TN.

G. The ONS will Facilitate Telephone Number Portability

The ONS will develop a set of policies and procedures for consumers to "port" telephone numbers in the ONS VoIP system. Because the ONS *is* a VoIP network, it will use the same porting requirements as are used by any VoIP network provider, along with certain additional requirements to support interconnection to multiple relay service providers. One of the many advantages of the ONS is that number portability will be handled by a central entity, which will facilitate coordination by the various Internet-based

IP relay and VRS providers. Below are two scenarios that will illustrate the means by which the ONS will handle number porting:

> Scenario #1 – Porting between two relay service providers connected to the ONS VoIP network. This is where an individual who is deaf or hard of hearing requests a change of the relay service provider that is to receive the user's in-bound audio calls from the PSTN. The user can either contact the ONS and request the change or contact the new relay service provider and request that the TN be ported. In the latter case, the new relay service provider will send the request to the ONS on behalf of the customer. After the change request is verified, the ONS will change the appropriate databases to direct all new incoming calls to the new relay service provider. The change will be coordinated as well with both relay providers.
>
> Scenario #2 – Porting to the ONS VoIP network from a relay service provider that is not connected to the ONS VoIP network when the user wants to keep his or her current phone number (e.g., porting the number from a traditional, PSTN-based TRS provider to a VRS provider). This is where an individual who is deaf or hard of hearing requests a change of the relay service provider that is to receive the user's in-bound audio calls from the PSTN and the new relay provider is interconnected to the ONS VoIP network. The user must contact the ONS and request that the TN be ported. The ONS will send the request to the telephone company on behalf of the customer. The telephone company will then sign the paperwork authorizing the number to be ported to the ONS. The change will be coordinated between the ONS and the former telephone company.

The ONS will also develop procedures to mitigate slamming as part of the procedures for consumers to port TNs on the ONS. These procedures, which will require positive verification from the individual before a number is ported, will mirror the verification that is already required for changing carriers under the FCC's current slamming rules. Such verification can either take place through a live video or text session with an ONS customer service agent or through a paper-based system. The ONS is better suited to

mitigate slamming than other numbering proposals because it uses a centralized numbering authority that is independent of relay service providers. More specifically, the ONS can establish one uniform and consistent process for numbering porting and consumer verification, while other proposals would have to rely on numerous processes for these functions, each of which can vary widely. Moreover, if these functions are divided among providers, those with smaller market shares might have a tougher time because they may have to financially support the porting of numbers by multiple rural telephone operating companies.

Although recent years have witnessed a decline in slamming by PSTN-based carriers, the unauthorized transfer of a customer's business remains a real problem in the world of telecommunications. VRS is a highly competitive industry, one that has been subject to aggressive marketing tactics designed to win over customers to the greatest extent possible. The incentives for and the ability to conduct slamming in this industry will be reduced considerably if a single, centralized database is responsible for the distribution, maintenance and porting of numbers in a global Internet-based numbering system.

H. The ONS Will Provide a Secure Database System for Relay Providers to Obtain Routing Information

Authorized relay service providers will have a secure method to query the central ONS database on an equal access basis to meet call

routing and E9-1-1 requirements (Figure 10 - Address Resolution Query for Relay Service Provider). The database, operated, managed, and maintained by the ONS organization, will contain user names, TNs, physical location address information and email addresses. The system will have multiple levels of system redundancy and will be designed to handle high volume situations that often occur during major human events or natural disaster scenarios. Only registered and certified relay service providers and law enforcement agencies will be allowed to query the ONS database, in real-time, for primary address locations. A methodology for certification of relay service providers to ensure secure access to the database will be developed, and all relay service provider access to the database will occur over the Internet. In addition, all database queries and modification of TN records will be logged and tracked to prevent abuse and unauthorized access, and to provide historical data and records.

I. The ONS will Support and Facilitate the Transition to New Communications Protocols and Technologies

The ONS system is designed to provide a central address database that is accessible by all certified relay service providers on an equal access basis. One of the primary attributes of the ONS is that, in addition to maintaining current systems to allow relay service providers to have backward compatibility with legacy devices, it will facilitate the development and adoption of new databases and applications that support the introduction of enhanced communication protocols (e.g. SIP) and addressing schemes (e.g.

IPv6). This is because it will be far easier to coordinate implementation of these changes across all relay providers with a single, centralized numbering system than it would be with competitive systems operated by several providers, each of which will have their own policies and procedures. This will help to drive the continuous improvement of communication solutions by and for the deaf and hard of hearing community. Moreover, because consumers will be on the ONS governing board, they can have an active say in how these new protocols and technologies are developed and rolled out to the community.

For example, having a centralized system will facilitate adoption of improved notification techniques to inform deaf and hard of hearing relay users of pending calls, the enabling of single line VCO and HCO calls, and innovations to facilitate the receipt of calls, including technologies that can ring multiple devices at a single location and allow individuals who are deaf and hard of hearing to take calls at any device at that location.

Of particular importance will be a smooth transition by VRS providers to SIP based technologies. Although VRS currently rely primarily on the H.323 protocol, video manufacturers in the mainstream video market are building their devices to SIP specifications (indeed, H.323 video devices are no longer even available in retail stores). One of the many advantages of SIP is that it will allow VRS users to have multiple devices in their homes that answer to the same telephone number, as is the case for voice telephone

users.[9] Because the ONS uses a common addressing system, it will allow an easier transition for providers shift to SIP technology for signaling and the support of newer forms of media, far easier than it would be to bring together 11-15 different providers with varying numbering systems, all of which would have to agree on the policies and procedures for the new protocols. Because video communications across the Internet are now coming to rely exclusively on SIP, moving to this technology will be necessary to avoid the segregation of VRS users.

J. The ONS Will Facilitate the Provision of E9-1-1 Services

The ONS network will provide a complete E9-1-1 interface for any relay service provider that interconnects with the ONS VoIP network. When a deaf or hard of hearing individual calls a relay service provider in a 9-1-1 situation, the provider will be able to automatically complete the call to the geographically correct PSAP. This will be achieved by having the relay services provider present the deaf or hard of hearing user's TN to the ONS positioning center and routing the call, with the appropriate information, over the selective router network to the correct PSAP. The ONS will contract with major E9-1-1 network providers for the purpose of handling 9-1-1 calls made by IP relay and VRS users.

Under the proposed ONS system, deaf and hard of hearing users will be responsible for initially providing and maintaining up-to-date primary

[9] This is currently not possible under any of the numbering proposals because all still rely on the H.323 protocol.

location information for their assigned TN. Each relay user will be able to contact any relay service provider for 9-1-1 situations and that provider will be able to conduct a secure query of the ONS database for the TN of the registered user to complete the 9-1-1 call (Figure 13 – ONS Support for E9-1-1 Calls to Any VRS Provider).

Having a centralized common E9-1-1 system will enhance the overall availability of E9-1-1 services during severe emergency situations (e.g. large fires, severe weather or major disasters) because relay users who are deaf or hard of hearing will be able to use any relay provider, not just the relay provider that issued their TNs. Rather 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 to these exigent circumstances. A centralized E9-1-1 system will also be more cost effective for the TRS fund, as compared to having each provider individually contract for an E9-1-1 positioning system. The initial cost estimates for positioning systems, through the major providers of this type of product, indicate that the cost to each provider will be more than $5,000 monthly.

K. The ONS will Provide a Mechanism to Support Fraud Mitigation

As a centralized entity, the ONS network will be in a position to collect essential IP address, TN and timestamp information on all queries made to the ONS database. Having this call information in one location will

be exceedingly useful when needed to assess network and system demand, diagnose and troubleshoot network and database problems, and assist relay service providers in resolving numbering problems that might arise. The centralized database could also be used to provide information to assist the FCC in better understanding and responding to relay fraud in a timely manner. This is in contrast to other proposals, where calls will be routed through multiple relay service providers, a process that will make the collection of call data and timely solutions far more difficult.

At the same time that CSDVRS and CSD see a value in having this aggregated data, we strongly believe that the information contained in the centralized database, notwithstanding prior FCC consideration of relay services as an information service, should be considered customer proprietary network information (CPNI) that is protected under the Communications Act.[10] As such, this information should be subject to the Commission's recent revisions to the CPNI rules, which strictly delineate their permitted use and disclosure (especially with respect to marketing). Most importantly, service providers should be prohibited from accessing this

[10] The Communications Act imposes a duty on telecommunications carrier to protect the confidentiality of proprietary information of its customers. 47 U.S.C. § 222(a), implemented at 47 C.F.R. §§ 64.2001, *et seq*. The question of whether relay services are telecommunications or information services has not been settled at the FCC. Regardless of how this is resolved, however, the FCC should apply the same protections that exist under its CPNI rules to all information collected by the ONS or any databases used to achieve uniform numbering.

information for the purpose of identifying or tracking the use of competing service providers by individual customers.

L. The ONS will Foster Relay User Security

Individuals who are deaf and hard of hearing need a centralized, neutral numbering system that is both functionally equivalent to what voice telephone users have, yet still maintains user security and privacy to the greatest extent possible. The ONS VoIP network can achieve both of these goals by providing the highest level of user security possible, while maintaining a reasonable balance between security and system openness. Although the other numbering solutions do provide a secure environment, they restrict some forms of access, denying true functional equivalency to the user community. This is because although under the other proposals, each provider's numbering network would allow the exchange of information among providers for call completion, in reality the proposals create a series of closed networks that allow calls only among each other, by providing access only through each others' databases. As noted above, these closed networks will only support calling between devices supplied to individuals who are deaf and hard of hearing on the respective networks. The only way a hearing caller would be able to access these closed networks is by making a VRS or TRS call from the PSTN; the networks would be closed to hearing callers who are fluent in ASL and have compatible H.323 devices (hardware or software). Otherwise stated, those hearing users would not be able to use

the TN of an individual who is deaf or hard of hearing to make a point-to-point call to that user.

As the FCC goes forward in designing and implementing a global Internet-based numbering system for relay users, it should make every effort to emulate the PSTN. Put simply, the PSTN 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. For the most part, this open system runs smoothly. On the infrequent occasions that abuse occurs, mechanisms exist to get that abuse in check (e.g., hearing individuals can block calls, change their telephone number, or have their telephone monitored for unauthorized activity). This is the price of any open system. Indeed, the Internet, as it is used by people who are deaf *or* hearing, also suffers from potential abuse and individuals must take measures to protect themselves while on-line.

The ONS VoIP network is designed to provide individuals who are deaf or hard of hearing with the maximum protection possible, while maintaining the greatest flexibility for making and receiving all types of calls – not just calls to and from the PSTN. It is for this reason that the ONS VoIP network system design includes the ability to make and receive point-to-point calling via the Internet, both within the deaf community and with hearing family members and colleagues who are ASL fluent. While beyond the scope of this relay proceeding, it would be shortsighted to create

a new telephone system in the 21st century that did not permit people who are deaf and hard of hearing to use their primary or native language when communicating with anyone over distances, whether or not the PSTN is part of the call.[11] Not only will providing an enhanced communication experience in this fashion be in the best interests of the deaf and hard of hearing community, it will also best serve the interests of the FCC and the Interstate TRS Fund because this flexibility will potentially reduce the number of VRS minutes charged to that Fund.

As is the case for any Internet access, the ONS requires individual users to practice safe Internet access procedures. To this end, the One Number Service Module has a built-in firewall, port forwarding, and is configured to only allow video calls to be forwarded to the appropriate device. This design will protect users from unwarranted random calls; however, no system – PSTN or otherwise – will reject a call if the PSTN phone number is known to that network. Like the voice telephone network, the ONS VoIP network is designed to quickly respond and mitigate problems associated with abusive calling by allowing the deaf or hard of hearing user to block calls from the telephone number used by the offending party or

[11] Indeed, CSD believes that permitting such access would be in keeping with the proposed legislative agenda contained in the staff draft released in December 2007, by the U.S. House of Representatives, a legislative proposal that would require equal access to all Internet-based communication technologies. See http://markey.house.gov/docs/telecomm/draft_of_telecom_legislation.pdf

allowing the deaf or hard of hearing user to change to a new telephone number.

Because protecting the user from attacks on the Internet requires additional measures, the ONS has integrated further protections in its design of the ONSM, which is provided to all deaf or hard of hearing individuals. Specifically, where a relay user has a router on an Internet access line and uses the software ONSM, the ONS customer service group will instruct the user about safe Internet practices and how to configure the router to allow only video calls to be forwarded to the videophone, thereby protecting the rest of the computer and devices behind the router from attack. The ONS will also have programs and mechanisms in place that will prevent IP address harvesting and high demand query activity normally associated with attempts to harvest IP addresses. At the same time, the ONS will be designed to allow authorized relay service providers to make high query demands on the ONS system to support valid business requirements. Finally, the ONS system will monitor system access and actions by the relay service providers to prevent system abuse.

The bottom line is that in order to achieve communication access that is functionally equivalent to mainstream voice telephone services, the global numbering system approved by the FCC must not only allow access by people who are deaf and hard of hearing to and from the PSTN; it must also be both practical and forward thinking by ensuring access to and from

compatible videophone devices connected to the Internet. Any Commission action short of this will be restrictive, create a closed and segregated system for the deaf or hard of hearing community, and fail to achieve full telecommunications equality.

IV. Conclusion

CSD and CSDVRS thank the FCC for the opportunity to refresh the record in this proceeding. As both consumers and providers of relay services, we jointly agree that the ONS, as the only neutral, centralized numbering system proposed to the FCC, is the only system that will provide both full functional equivalency for deaf and hard of hearing individuals and a level playing field for the competitive VRS industry. We look forward to working with the FCC in the months to come as it finalizes plans for a global Internet-based numbering system for relay users.

Respectfully submitted,

/s/
Ben Soukup, CEO
Communication Service for the Deaf Network
102 North Krohn Place
Sioux Falls, SD 57103
605-367-5760

/s/
Sean Belanger, CEO
William Cobb, VP,
Engineering and Operations
CSDVRS, LLC
600 Cleveland Street
Suite 1000
Clearwater, FL 33755

Of Counsel:

Karen Peltz Strauss
KPS Consulting
3508 Albemarle Street, NW
Washington, D.C. 20008
202-363-1263
kpsconsulting@starpower.net

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