AUSTRALIAN ASSOCIATION OF THE DEAF INC.

What is Deaf equivalent to Voice Telephony?

Discussion Paper

Why is this paper about Deaf equivalent to Voice Telephony?

Recently the Department of Communications, Information Technology and the Arts (DCITA) released a draft Statement of Requirement for the National Relay Service (NRS), for public comment. In the draft Statement of Requirement for the NRS, the Government was looking at the possibility of Internet Relay, Video Relay and SMS Relay services being premium services (which mean Deaf people will have to pay extra money to use these services). Australian Association of the Deaf Inc (AAD) sent in a response stating that these new Relay Services **should not** be premium services, they should be standard services like the current text NRS. At the time of writing this discussion paper we still do not know what will be included in the final Statement of Requirement. If the Government agrees to include these new relay services as standard services in the new NRS contract, this will be a big step forward.

As well as the NRS, there are other issues that need to be addressed.

In the telecommunications environment today, there is a lot of discussion about Voice over Internet Protocol (VOIP) because this technology is now available and it is fast growing. The government, industry regulators and the telecommunications industry are looking at various ways to improve the current VOIP services.

Video telephony through broadband comes under VOIP services because it uses the same technology. It is a technology that enables Deaf people to communicate in sign language. 3G mobile telephones also have video capability.

Section 6 of the *Telecommunications (Consumer Protection and Service Standards) Act 1999* defines the standard telephone service (STS) as being:

- a telephone service fit for the purpose of voice telephony, or
- if voice telephony is impractical for a person with a disability, a form of communication that is equivalent to voice telephony.

The clause (1)(b)(ii) refers to 'another form of communication that is equivalent to voice telephony (for example communication by means of a TTY)'. It does not say that only TTYs are to be considered. It gives room for other equipment to be used, in whatever form is equivalent to voice telephony.

It also says in the same Section 6, that voice telephony can include the carriage of data. Video transmission is **data**.

You need to keep all of this in mind when you read this discussion paper.

AAD would like to generate discussion and feedback on what the Deaf equivalent to Voice Telephony is, which will help us to know what your views are when we are lobbying for better access to telecommunications.

Before we go into the discussions, we would like you to tell us a little bit about yourself. This information will help us to see the different issues, in order of male or female, age group and which State or Territory. We do not need you to give us your name or address.

Please look at the Questionnaire and complete the information about yourself.

1. History of telecommunications

Alexander Graham Bell is remembered as the inventor of the telephone. What is not commonly known is that he was not only a teacher of the Deaf, but was married to a Deaf woman. It is through his interest in deafness and fascination with acoustics that the telephone was invented in 1876, with the intent of helping Deaf and hard of hearing people.

Source: http://sln.fi.edu/franklin/inventor/bell.html

Bell imagined great uses for his telephone, but would he ever have imagined telephone lines being used to transmit video images? Since his death in 1922, the telecommunication industry internationally has undergone an amazing revolution.

Jump forward to 2005 in Australia.

There are several different types of telecommunications and equipment that suits nearly everyone on the market today. There are a fast growing number of different fixed line telephone handsets, including the recently launched SMS enabled fixed line phone handset (1) which can be used to make both a phone call or to send SMS messages. Broadband telephone handsets are available to the public, which people can use to phone through the Internet to any phone (fixed line or mobile handset). And then there is the new Broadband Videophone (2) which can turn your TV into a Broadband Videophone.

(1)

(2)

Mobile telecommunications has enabled Deaf people to use Short Message Service (SMS) on any handset, which has made it easier to contact our friends (no matter Deaf or hearing) while we are on the move. 3G mobile handsets are available currently from '3' but by mid 2005, Vodafone, Optus and Telstra will be launching their 3G services. Deaf people have found the 3G video option very useful even though you do have to sign a little slower than usual.

Mobile Phone Handsets from '3'

Short Message Service (SMS)

The Internet is now not just something that you use to look for information, send email or to chat, it is now being used in telecommunications. Now that Broadband telephones and videophones are available they open up wider possibilities. Private businesses are now using video telephony for business for example, tele-conferencing via video.

It is all great for people who are able to hear. Telecommunications enables hearing people to participate and contribute to today's multicultural society. Unfortunately today's telecommunications do not give Deaf people the same choice. We are tied to the old TTY technology as our only means of "real time" communication.

2. What telecommunications we use today

At the moment, the only telecommunications device that we can use to communicate in real time with our hearing peers is the TTY. Unfortunately, we cannot always phone our hearing friends/colleagues/families directly because they do not have a TTY. This is where the National Relay Service comes in. By using the National Relay Service, we can 'talk' to our hearing friends/colleagues/families through a Relay Officer.

Also, we have the world's first text based Emergency Service, that enables us to contact Police, Ambulance and Fire by dialling 106. This has helped Deaf people enormously when we are faced with emergency situations.

AAD acknowledges the significant impact the NRS has made in Deaf, hard of hearing and speech impaired Australians' lives. Indeed it was AAD itself who most actively and consistently lobbied over a period of some 10 years for a NRS and was most grateful when the Australian government agreed in 1994 to provide funding to establish the service.

Some Deaf people still use fax machines to send messages and many Deaf people have DUET systems where we can use a fax machine and TTY on one telephone fixed line.

For the past 3-4 years, mobile phones have enabled Deaf people to use SMS messaging to get in touch with other people, regardless of whether they are Deaf or not. Mobile phones have now grown in number so much, that there now are more people owning them than fixed line phones. Some Roadside Assistance Services, taxi services and one Police service (in WA) provide SMS numbers for Deaf people to access their services.

There are now 3G video mobile phones available from '3' which allow a Deaf person to use Auslan to speak to other people who use Auslan. Unfortunately, it does not make it easy for Deaf people to talk to hearing people via video as not everyone knows Auslan!

Many Deaf people use MSN, ICQ or AOL via computers, to chat nowadays. It is known that some Deaf people get together on MSN to discuss topics or decide on where to meet up socially that week, etc.

Internationally, there is a big movement from TTYs to video telephony in Deaf communities especially in the USA, Scandinavia and the UK. It is now possible in Australia, but there are some issues that we have to work through and these issues form the basis of this Discussion Paper.

If one stops to think about what Deaf people use in telecommunications today (TTY, NRS, SMS, MSN, Email…), all of them are English text based except 3G mobile phones. This means Deaf people still have to communicate in English and for some people it is difficult to say what they want to say in English. TTY users also must know how to type. Sometimes spelling errors cause a problem in communication! Sometimes the Relay Officers do not understand what we are saying and this makes communication harder to follow.

Also if we are talking to someone who likes to chat a lot, we have to wait quietly until the other person types in GA before we can respond. A conversation like this takes much longer than communicating in our language, Auslan.

There is more information about TTYs and the NRS later in this paper.

3. Real Time Communication – what it means

Real time communication happens when two people are talking together at the same time. For example, you are signing to your friend about the movie you saw last night. Your friend will probably ask you questions or say yes, I saw that too – the film was great etc. Maybe you both will laugh about a funny scene in the movie.

When hearing people use the telephone, they can talk and laugh about things because they can speak to each other and use their own language, which is English. Sometimes hearing people both talk at the same time when on the telephone. Deaf people cannot do that on a TTY.

When you use a TTY, we have to use GA every time we finish what you want to say for now, before the other person can type back. It is always my turn, your turn, my turn etc. We cannot talk at the same time.

When you send SMS messages, you have to wait before you receive a reply. Sometimes people are quick at responding and sometimes they will reply much later because their mobile was off or they ran out of credit, or they didn't see your message straight away. Some messages even get lost in space! This is very different to real time communication and is not always reliable.

4. Auslan – Signed vs Spoken

In 1972, there was research that showed hearing people speak an average of 4 to 5 words per second and sign language users sign about 2 to 3 signs per second. Signing only looks slower, however. What people convey in 'information' (what you talk about) is about 1 or 2 'propositions' (ideas or stories) per second for **both** speaking and signing, ie there is no difference in the rate of information exchange in signed and spoken languages[1]

It just takes more words than signs to say the same thing. Signs, their orientation, movement, emphasis and associated facial expressions contain a depth of meaning that takes more words than signs to accurately translate into spoken language.

Let's suppose that a Deaf person got up to present a paper at a conference and has an interpreter. The Deaf person will sign at 120 – 180 words per minute average. The interpreter will be talking in English at 240 – 300 words per minute because they have to change from Auslan to English, and it takes more English words to say what the Deaf person is saying in Auslan. That is the difference between Auslan and English.

[1] *Bellugi, U., & Fletcher, S.D. (1972). A comparision of sign language and spoken language. Cognition, 1, 173-198. Fischer, S.D., Delhorne, L.A., & Reed, C.M. (1999). Effects of rate of presentation on the reception of American Sign Language. Journal of Speech, Hearing and Language Research, 42(3), 568-582.*

5. TTYs and the NRS – Some interesting facts

TTY technology uses Baudot 50 to communicate. What this means is a TTY can transmit and receive at 50 baud meaning 50 bits per second. Technically it means TTYs use the baudot character set which is 5 bits per character plus a 1 bit start bit plus a 1.5 bit or 2 bit stop bit, thus totaling 7.5 or 8 bits per character.

At 50 bits per second the number of characters per second is 6.7 (at 7.5 bits per character) or 400 characters per minute.

If the average word is 5 letters plus a space, a total of 6 characters is used. This will mean the number of words per minute (w.p.m.) a TTY can handle is around 67 w.p.m.

The National Relay Service uses Baudot 50 technology to handle all the relay calls and this would mean that an average TTY conversation handled via the NRS will be no more than 67 w.p.m. maximum.

=67 words per minute maximum

The average spoken words per minute when a person talks (and when Auslan signs are interpreted into spoken English) is between 240 – 300 w.p.m.

= Average of 240-300 words per minute

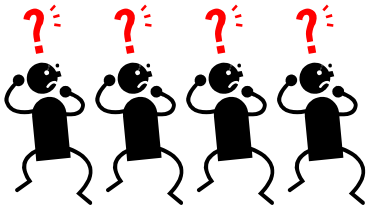
This means it takes much longer for Deaf people to talk to someone on the TTY or via the NRS! It takes 3½ to 4½ times longer to tell someone something on the TTY instead of talking face to face in Auslan.

= 3½ – 4½ times longer to do a telephone conversation!

Some Deaf people have reported that their hearing friends/colleagues/families have found that talking via the NRS is too slow. It is very rarely used for business calls because many people in businesses are always busy and do not have much time or patience to take a

NRS call.

It is also important to remember that it is only because of the TTY technology that everything is slow. The NRS cannot handle faster calls because it is the TTY that is slow. TTY technology is very old and will be around for some time while we look at other possible technologies available internationally.



6. What technology is available?

Since the NRS was formed in 1995, it has grown in strength and currently provides the following services:

- Text to Voice & Voice to Text
- Hearing Carry Over (HCO)
- Voice Carry Over (VCO)
- Emergency Relay Service (106)
- Reverse Charge Calls (RCC)
- Personal Relay Service (PRS)
- Speech to Speech Relay (SSR)

The Emergency Relay Service (106) was added at the beginning of 2000, offering a world first national text-based emergency service.

At the time the NRS was formed in 1995, the only technology available for Deaf people was the TTY. That was considered the voice equivalent at the time. Technology has advanced so much since 1995 and now there are new technologies that enable Deaf people to communicate in different ways.

Also, the Disability Equipment Program provided by Telstra and Optus enables Deaf people to rent a TTY, for the same price as a hearing person would rent an ordinary fixed line telephone. Braille TTYs, flashing lights and few other types of equipment are also available. But you need to have a Telstra or Optus home phone connection. Some other telephone carriers like Primus have provided TTYs on per request basis.

Internet Relay (IR)
Internet Relay is now available in some countries, like USA and NZ.

To use Internet Relay, all you need to do is log on to the Internet and type a special www address to connect to the Relay Service online, on any Internet connection. Because it is text based, there are no restrictions on how fast or slow you can type when typing in your message. That means anyone can type as fast as they can and if someone can type 100 words per minute, it will be faster to use the Internet Relay than the TTY Relay (NRS).

Source: http://www.consumer.att.com/relay/internet/

Can you imagine when you are at an airport, you can use the Internet booth to make a call through Internet Relay! We could go to internet cafes, Job Network Centres and to work and still be able to make a call to anyone through Internet Relay. Also anyone with a laptop and a wireless connection or PDA with WAP facilities can access the Internet Relay.

For more information, visit these websites:

Sprint Relay (USA) http://www.sprintrelayonline.com/
AT & T Relay (USA) http://www.relaycall.com/national/index.html
Sprint Relay (NZ) http://www.internet.nzrelay.co.nz/

Video Telephony & Video Relay

There are several different types of video telephony available in today's market. Several businesses have video conferencing equipment with ISDN or Internet connections. Similar video equipment is now being used in hospitals and health care. Some remote schools have video link ups with main schools in their area. These are only a few examples where video telephony is being used today.



With Broadband technology now available, many Deaf people are now using webcams to see each other but the quality is still jerky. When you use the Broadband Videophone connected with your TV, the story is different. In the USA and UK, Deaf people are now using Broadband Videophones connected via their TV sets and the feedback from the Deaf community there is that the picture quality is fantastic (depending on your broadband speed & plan). The minimum bandwidth requirement for this Broadband Videophone via TV is 256kbps/256kbps (upload/download) and this is available from some of broadband service providers, but is usually much more expensive. Some broadband plans have limited download limits but for Deaf people to use the Broadband Videophone, we need to have unlimited download. Also, for it to work effectively, you need to purchase your own Internet Protocol address from your ISP provider (approximately $20 a month extra)

These type of broadband videophones are the ones that the Deaf community in USA and UK use to connect to the video relay service. Sorenson Video Relay Service provides free equipment for Deaf people however, the Internet connection has to be paid by the Deaf person themselves.

Video relay service works the same way as the NRS, but instead of using a TTY, you use a videophone (either through a TV or on computer) and make calls via a Relay Officer who is also a sign language interpreter. Deaf people do not need to use English to communicate! Instead, you can sign! Phone calls will be quicker, shorter and most importantly, easily understood.

Source: http://www.consumer.att.com/relay/video/index.html

3G mobile phones are now being used in the Deaf community and some say it is fantastic while some say it is still a bit slow and jerky. Vodafone, Optus and Telstra are launching 3G services mid-2005 and it is expected that the quality of picture will improve. But are using video calls on 3G phones the same price as voice calls?

In Sweden, '3' have launched sign language videos on their website for their Deaf customers, for information on their services and also they are working on making it possible for 3G phones to communicate with PC webcams. This will mean a Deaf person using a 3G phone could in the future talk to someone at home using their PC and webcam.

7. Conclusion

Since the telephone was invented, the telecommunications industry has grown in diversity and there are several types of telecommunications equipment available to everyone. However, the question we have to remember is 'What is Deaf equivalent to voice telephony?' Is it the TTY? Is it the mobile phone? Is it video telephony? We would like you to think about what you feel is equivalent to voice telephony for Deaf people.

At the moment, the law says that we must have access to the telephone by what it calls 'voice equivalent' and this can include transmission of data. Transmission of data is how video telephony and Internet relay operate.

Do you think if we keep using TTYs, this would be good enough for our needs? Remember, we have to communicate in English when we use a TTY. Should we also be looking at video telephony as well? Have both? What will you say if you are offered one or the other? Would you choose an updated TTY or go for video telephony?

At the time of writing this discussion paper, video telephony was the only other viable option that offers Deaf people real time access to telephones via their preferred language. Maybe some of you know of other technologies that you think would enable us to use the telephone without using English? If so, we would love to hear from you and if you can supply us with any relevant information, we will be happy to investigate other options.

Do you think the Deaf community is ready to change over to video telephony? If not, can you let us know your thoughts about why you do not think this is the case.

Have a think about the telephone bills. Would you be prepared to pay more for an expensive broadband connection (with the highest bandwidth, unlimited downloads and fixed IP address) to be able to use a video telephone? If not, would you be prepared to pay for this service if the telecommunications service providers (such as Telstra and Optus) did a special broadband pricing plan for Deaf people who use video telephony?

If you do not have a computer at home, you are still able to use the Broadband Videophone that is connected to your TV instead. It does still mean that you will have to pay for a broadband plan. But would you change your phone line to broadband and have video telephony instead of a TTY? Do you think the telecommunication service providers should have special pricing plans for Deaf people who use both TTYs and video telephony at home? If so, what prices do you think is reasonable per month?

Please read the Questionnaire attached to this paper and you will see that we have asked you some questions relating to some of the topics covered in this document. A few minutes of your time completing the questionnaire means a lot to us as it will mean we have a lot more information to present to the government and the telecommunications industry.

Thank you

Comments and feedback

AAD looks forward to your comments on this paper. As you can see it addresses many issues. We may have missed some, so please tell us your ideas, concerns and thoughts.

The deadline for feedback is Friday 26 August 2005.

If you wish to provide feedback or ask questions, you can do one or all of the following:-

1. Fill out the questionnaire form and fax to:

   Andrew Wiltshire
   Community Liaison and Projects Officer
   Fax: 02 9871 8400

2. Fill out the questionnaire form and post to (FREE POSTAGE):

   Andrew Wiltshire
   Community Liaison and Projects Officer
   Australian Association of the Deaf Inc
   Reply Paid 1083
   STAFFORD
   QLD 4053

3. Electronically complete the form and email to:

   Andrew Wiltshire
   Email: andrew.wiltshire@aad.org.au

4. Visit AAD's website, go into DTAN Discussion page and type your comments on www.aad.org.au

Your feedback and comments are very important for us because we need to know what the Deaf community feels so that we can represent you fairly when we lobby for increased services or goods.

After receiving feedback from the community, we will share your comments with the government, telecommunications industry, mobile phone providers, community services and the other members of the Deaf community as well as on our website.

Andrew Wiltshire
Community Liaison and Projects Officer

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