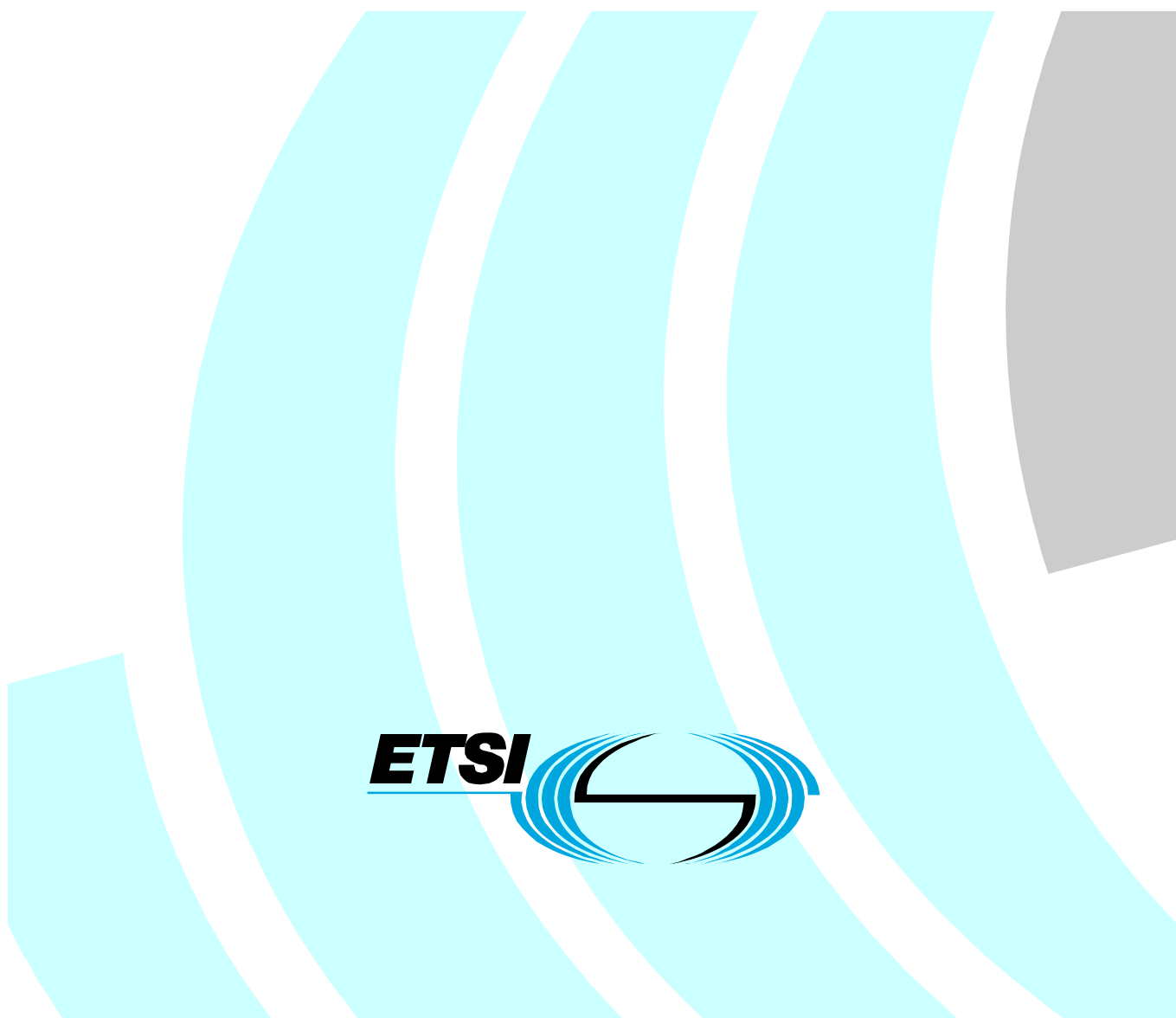


Human Factors (HF); Telecommunications relay services



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Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Human Factors (HF).

Introduction

The present document is intended to set out the background to ES 202 975 [i.5] the standard on Harmonized Relay Services, to describe the research involved and to provide general information on relay services derived during the research. Relay services in the sense described in these documents, are communication services that translate between different modes of communication.

Relay Services are provided mainly to enable people with communications related disabilities to participate on more equal terms in a society where telephony and electronic communications have become such an important part of life.

1 Scope

The present document sets out significant background information to the writing of ES 202 975 [i.5] Harmonized relay services.

It records the results of researches made during the preparation of the standard.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

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Not applicable.

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

[i.1] BT SIN 359: "BT TextDirect™ Service description".

[i.2] EICTA: "Position paper on eInclusion", Brussels, 5 November 2008 .

NOTE: See at <http://www.eicta.org/index.php?id=34&id-article=290>.

[i.3] ETSI EG 201 013: "Human Factors (HF); Definitions, abbreviations and symbols".

[i.4] ETSI EG 202 320: "Human Factors (HF); Duplex Universal Speech and Text (DUST) communications".

[i.5] ETSI ES 202 975: "Human Factors (HF); Harmonized relay services".

[i.6] ETSI TR 101 806: "Human Factors (HF); Guidelines for Telecommunication Relay Services for Text Telephones".

[i.7] IETF RFC 3261: "Session Initiation Protocol (SIP)".

- [i.8] IETF RFC 4103: "RTP payload for text conversation".
- [i.9] ITU-T Recommendation F.703: "Multimedia conversational services".
- [i.10] ITU-T Recommendation H.323: "Packet-based multimedia communications systems".
- [i.11] ITU-T Recommendation T.140: "Protocol for multimedia application; Text conversation".
- [i.12] ITU-T Recommendation V.18: "Operational and interworking requirements for modems operating in the text telephone mode".
- [i.13] ITU-T Recommendation V.23: "600/1200-baud modem standardized for use in the general switched telephone network".
- [i.14] NTFH: "Nordic guidelines for Telecommunications relay services".
- [i.15] TIA-825-A: "A Frequency Shift Keyed Modem for Use on the Public Switched Telephone Network".
- [i.16] FCC 47 CFR § 64.601-606: "TRS Rules. FCC USA, The set of regulations that form the basis of the relay services in USA. It is amended when new details take effect".
- NOTE: See at <http://www.fcc.gov/cgb/dro/4regs.html>.
- [i.17] FCC 08-151A1 E911: "Requirements for IP-Enabled Service Providers", June 2008.
- NOTE: See at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-151A1.pdf
- [i.18] ITU-T Recommendation V.21: "300 bits per second duplex modem standardized for use in the general switched telephone network".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EG 201 013 [i.3] and the following apply:

automatic relay service: service that enables a conversation between two terminals using different communication modes by providing the facility of automatic conversion between the two modes in substantially real time

captioned telephony: service that assists a deaf or hard of hearing user in a spoken dialogue by providing text captions translating one direction of the conversation

NOTE: The service is usually provided via the Internet on a computer associated with the telephone being used.

lip-reading relay service: service that enables lip-readers and voice telephone users to interact by providing conversion between the two modes of communication in substantially real time N

NOTE: This conversion is normally provided by a human operator who is a lip-speaker.

operator: person whose prime task is to provide assistance and support to users (also known as an "attendant")

relay service: telecommunications service that enables users of different modes of communication to interact by providing conversion between the modes of communication

sign relay service: service (often known as a video relay service) that enables sign language users and voice telephone users to interact by providing conversion between the two modes of communication in substantially real time

NOTE: This conversion is normally provided by a human operator.

speech to speech relay service: telecommunications service that enables speech impaired telephone users and other users to interact by providing skilled assistance between them

NOTE: This assistance is provided by a specially trained operator.

text relay service: telecommunications service that enables text telephone users and voice telephone users to interact by providing conversion between the two modes of communication in substantially real time

NOTE: This conversion is normally provided by a human operator.

text telephone: terminal offering text telephony functions, either as a stand-alone unit or as an addition to a voice telephone or as an application in a multi-function computer based terminal

text telephony: telecommunications facility offering real time text conversation through telecommunication networks. Text telephony may be combined with voice telephony

NOTE: See EG 201 013 [i.3].

text to text service: telecommunications service that enables two text telephone users to interact by providing any necessary protocol conversion between the two text telephones in substantially real time

NOTE: This conversion is normally provided automatically.

total conversation: audiovisual conversation service providing bidirectional symmetric real-time transfer of motion video, text and voice between users in two or more locations

NOTE: See EG 202 320 [i.4] and ITU-T Recommendation F.703 [i.9].

V.18 protocols: protocols in accordance with ITU-T Recommendation V.18 [i.12]

NOTE: The text telephones supported by V.18 are EDT, 5-bit (or Baudot), DTMF, V.21, V.23, Bell 103 and V.18 based devices.

videophone relay service: service synonymous with sign relay service that enables deaf videophone signers and voice telephone users to interact by providing conversion between the two modes of communication in substantially real time

NOTE: This conversion is normally provided by a human operator.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

DTMF	Dual Tone Multi Frequency
EDT	European Deaf telephone
EICTA	European Information and Communications Technology Association
FCC	Federal Communications Commission (USA)
GSM	Global System for Mobile communication
HCO	Hearing Carry Over
QoS	Quality of Service
RNID	Royal National Institute for Deaf people
SIP	Session Initiation Protocol
SMS	Short Message Service
TRS	Telecommunication Relay Service
VCO	Voice Carry Over
VRS	Video Relay Service

NOTE: Referred to as sign relay service in the present document.

4 General

4.1 Background

A relay service in the sense described in the present document enables users of different modes of communication to interact by providing conversion between differing modes of communication. The primary motivation is to enable people with disabilities which influence their capability to use a voice telephone to have communication with voice telephone users and users of other types of communication than they have themselves. Relay services are commonly established as government enabled or government mandated services because of the evident economical and social value in fulfilling policies for the provision of equal opportunities for all in the field of communications.

The present document records the background to and research undertaken during the writing of ES 202 975 [i.5], the ETSI standard for Harmonized Relay Services. This standard was originally derived from TR 101 806 [i.6], Guidelines for Telecommunications relay services for text telephones which dealt mainly with text telephones and recommended very high performance targets based upon the best available in the world. The present document in its turn was largely based on the Nordic guidelines for Telecommunications relay services [i.14].

The primary aim of the new standard was to update the original technical report in the light of new opportunities in telecommunications, setting standards for new types of relay service that were not envisioned when the original report was written.

Secondly it was necessary to take on board the changes in the telecommunications environment. When the report was first written it was common for a single national operator to provide both the network and the relay service. Nowadays the network and the service provision are often run by different entities and it therefore became necessary in the ES 202 975 [i.5] to separate out those provisions such as supplementary services that are primarily network based.

Furthermore, as the purpose of a standard is to set mandatory requirements it was necessary to determine how many of the performance targets could be achieved in practice and what level of achievement was possible for each of the performance requirements.

4.2 Possible relay services

The original Technical Report TR 101 806 [i.6] set out detailed requirements for a basic text relay service based upon PSTN text phones and also for an ISDN videophone based sign relay service. Some reference was also made to providing textphone capability for Fax to speech conversion services and also for SMS and Paging services.

It was decided to consider new communications services introduced since the original document. The possibility of a signing service over IP and over mobile telephony was considered as was a lip-reading service and one for the translation of Fax to speech or text. In addition a service to assist users with impaired speech was investigated as was Captioned telephony.

4.3 Relay services in Europe

A search was made to find which services are currently available within Europe. Letters requesting information were sent to those ETSI members representing administrations within Europe asking for contact addresses of relay service providers within their Countries. They were sent to Administration representatives of Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Luxembourg, Malta, Norway, Poland, Portugal, Slovakia, Spain, Switzerland and the UK.

Replies were received from the Czech Republic, Finland, Malta, Norway, Portugal, Slovakia and Switzerland.

Further letters were sent to members of the European Union of the Deaf. Replies were only been received from Austria, Italy, Latvia and Serbia. A further attempt was made to seek information from the European members of the World Federation of the Deaf. This approach showed a little more success and replies were received from Austria, Bulgaria, the Czech Republic, Finland, Greece, Malta, Norway, Portugal, Serbia, Slovakia and Switzerland.

Further information was acquired through personal contacts in Italy, Greece, Spain, UK, Ireland, Norway, Sweden, Holland, France, Switzerland, Germany, USA and Canada.

The results of these enquiries showed that relay services exist in only a few European countries. Details of these services are given in clause 5.

4.4 Relay services internationally

Internationally, relay services are found at least in USA, Canada, Australia and New Zealand. Some relevant characteristics of them are described in clause 6. One service was also found that provides service in many countries over the Internet.

4.5 Motivations for establishing relay services

Relay services can be provided for both economic and social reasons.

Relay services can contribute to better integration of disabled people into society, thereby reducing the overall cost to society by:

- reducing unemployment;
- reducing the load on health services;
- reducing the need for support actions by colleagues at work;
- reducing the travel time of sign language interpreters and increasing their efficiency;
- reducing the travel time of text transcribers and increasing their efficiency;
- increasing work efficiency;
- reducing the loss of lives and property (by provision of emergency number calling via relay services to 112).

Relay services can contribute to meeting social policy goals to provide equal opportunity to people with communication disabilities by:

- Giving an opportunity to converse with anybody who has a voice telephone.
- Improving the harmony and efficiency of private life.
- Giving an opportunity to be more efficient and self-sustained at work.
- Providing a basis for equality at work.
- Providing equal access to emergency services in cases of emergency.

A cost/benefit analysis can be performed by evaluating these benefits and comparing them to the cost of providing relay services.

On the cost side of such evaluation there might be factors such as:

- Setting up, operating, maintaining and renewal of the technical system for the relay service.
- Maintaining the regulatory and financial platform for relay services.
- Education and manning of operators with suitable skills for each type of relay service.
- Informing the public about the availability of the relay services.
- Informing communication providers about the need to include relay service support in current and future communication systems.
- The cost of extra call routing via the relay service.

There are also costs for provision of suitable terminals to the relay service users that is seen in some countries as part of a broader social policy to provide equal opportunities in communication both permitting people using the same modes of communication directly, and for people using differing modes of communication to connect through relay services.

Costs to be taken into account in terminal provision include:

- The cost of provision, support, maintenance and renewal of terminal equipment.
- The cost of provision of extra communications services, subscriptions, numbers and communication.
- The cost of maintaining interoperability between terminal types and between terminals and relay services.
- The cost of providing information to the public on the availability of accessible terminals and services.

In some countries, terminal provision is included within the provision of relay services, while others provide separate funding for accessible terminals. Some countries leave users to provide their own terminals. The policy basis for terminal provision is usually that people with disabilities should be provided with equal opportunities to communication on equal terms with other people. The concept of terminal provision also includes terminal software to be used in equipment that the users have acquired through other means.

As the conditions are different for each service arrangement, these factors are not treated in detail in the present document.

4.6 Harmonization of communication systems

4.6.1 The need for harmonization

People with disabilities, have a need to be able to communicate directly with each other, and do so by mastering some common mode of communication.

History indicates that there is a great risk that incompatibilities can be created when the communication need is to be covered by technology based services. Communication systems for people with disabilities are often created as isolated local initiatives, and are not always interconnected compatibly as is the international voice telephone system.

Thus it may be observed that the manner of relay service provision can be both a harmonizing factor and a fragmenting factor for telecommunication services for people with disabilities.

4.6.2 The European experience

The different textphone systems in Europe and worldwide are a sad example of the effects of fragmentation. Each country developed its own national PSTN based real time text communication system without considering the need for any international communication infrastructure. International standards were created later with the vision that they could be used for such interconnection, but these standards were only deployed in one or two countries. Generally the forces to deploy that vision were too weak to make it happen on a Europe-wide basis.

The need to be able to call anybody anywhere and use the media and modes that work for both parties in a call persists, as does the need for interoperability between solutions for accessible forms of telecommunications in all networks.

4.6.3 Fragmentation caused by funding methods

The financing system for services can have a fragmenting effect as is demonstrated by the provision of sign relay services (known as Video Relay Service (VRS)) in the USA. The Federal Communications Commission (FCC) provided funding for VRS purely based on time based charges. The effect was that it was profitable for VRS providers to give videophone equipment to the users, provided that they were tied in to using the provider's service. By making it complicated or impossible to use the terminals for communication with other users and other providers' services, they optimized the payback of the investment in terminals. The FCC is still struggling to correct this sad negative side effect of the financing system, with new regulations requiring the possibility to move between VRS providers, and to be able to call easily between users of different providers.

The latest contribution to this series of efforts to correct mishaps in history is the important notice of proposed rulemaking "Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities: E911 Requirements for IP-Enabled Service Providers" (FCC 08-151A1 [i.17]), where the FCC requires VRS and IP text relay providers to provide ordinary phone numbers to the users. It also requires both direct calling between users by using that number, and calling from voice phones via relay services by using the same number.

It requires that emergency calls placed by Internet-based TRS users will be routed directly and automatically to appropriate emergency services authorities by the Internet-based TRS providers.

4.6.4 Relay services and local harmonization

Appropriate funding can also assist harmonization, Where public funding provides both the relay service and the terminals it is possible to ensure that all use the same protocols An example of this is Sweden where the relay service provided by the Swedish Post and Telecom Agency supports access by V.21 textphones and the procurement of terminals by the county councils specify compatibility with V.21 textphone systems. The procured terminals can then be used both for communication with other users within the same procurement area, and with the text relay service. Unfortunately this does not guarantee compatibility with users in other countries.

In the UK the relay service uses V.18 protocols and is compatible with most other systems and terminals except those using DTMF. Unfortunately terminals are not publicly provided and many users purchase terminals using proprietary protocols which do not guarantee universal compatibility.

4.6.5 Global harmonization

Since it is a documented need of people with disabilities to communicate with each other as well as with others through relay services, it is evident that efforts should be made to achieve interoperability globally between all users of accessible communication services. Relay service provision can play an important role in this, but efforts to publicize a common base for terminal interoperability are needed, as well as the establishment of gateway services from other systems to that common base.

EICTA has described a vision for implementing total conversation in an interoperable way based on RFC 3261 SIP [i.7] for call control, audio and video as commonly used in videophones, and ITU-T Recommendation T.140 [i.11] transported according to RFC 4103 [i.8] for real-time text. A document entitled "Total conversation from Vision to Implementation", referred to in their position paper on eInclusion [i.1] also recommends means by which systems implementing other technical methods of communication should be connected with the common base through gateways, thus fulfilling the users' needs of global interoperability in communication to give functional equivalence with voice telephony.

4.7 Inclusion of relay service users in the number plan

The main emphasis of the harmonized standard for relay services [i.5] is on the central task of the relay service to translate between modes of communication. It is that part of providing functional equivalence in telecommunications to disabled users that is the goal for the service provision.

Another part of providing functional equivalence in telecommunications is to provide the same method of calling and being called as that for other telecommunications users, i.e. by dialling one single number from the international number plan, and being called by an ordinary number with the relay service being automatically invoked.

This manner of "direct" dialling can be contrasted with the typical manner of calling by means of a multi step procedure where it is necessary to know the number of and make a call to the relay service and then ask to be connected to the desired destination of the call.

The USA is implementing a direct system for such number plan dialling for IP based Sign relay services and IP text relay services. The UK has for many years had a system, called TextDirect [i.1] which provides a large part of that functionality for PSTN textphone usage. In Sweden there have been trials with text, sign and speech relay services with direct dialling.

One essential application of direct dialling with automatic invocation of a relay services is when calling 112 for emergency services, and for the ability of the emergency services to call back to the person originating the call, automatically invoking the appropriate relay service. This aspect is being handled in a project called REACH112, initiated by the European Commission to be run during years 2009-2011.

The achievable improvement in accessibility provided by such calling systems are obvious. The standard for harmonized relay services [i.5] includes an informative annex that briefly describes a number of call set up methods, including that for direct dialling via relay services. However, it was outside the scope of the standard to define a European standard mechanism for such dialling and routing of calls. The topic should perhaps be revisited in a later technical network standard.

5 Relay services in Europe

5.1 Austria

At the time of writing the present document there are no relay services in Austria.

5.2 Belgium

A text relay service exists in Flanders, the Dutch speaking part of Belgium. It is called Teletolk and operates over the Internet using "chat".

The service is only available from 9 am until 7pm on working days at <http://www.teletolk.be/>.

For calls to other countries, Teletolk provides an interpretation service into Dutch, French or English.

Teletolk is financed by the Flandrian regional government.

There is no relay service in the Walloon region where French is spoken.

5.3 Bulgaria

At the time of writing the present document there are no relay services in Bulgaria.

One company provides 100 free SMS messages per month to deaf users.

5.4 Cyprus

At the time of writing the present document there are no relay services in Cyprus.

5.5 Czech Republic

A text relay for access by V.21 textphones is available in the Czech Republic, run by Telefonica O2, and funded jointly by the telecom operators through regulation from the Czech government.

Text users call 800 143 143.

Voice users call 800 142 142.

The service is open 24 hours per day.

There is also a fax relay service available.

5.6 Denmark

Denmark has a text relay service, provided through TDC. available through a web interface and from computers with V.21 modems and textphone software. The service is available 24 hrs per day.

The service is in transition from being financed by the major telecom operator to a system with the cost more evenly distributed between the operators.

A trial video relay service TegnKom is running as a project with government funding. It is available Monday-Friday 8.30 - 15.00.

5.7 Estonia

At the time of writing the present document there are no relay services in Estonia.

5.8 Finland

There is a text relay service in Finland which operates 24 hours/day.

It operates through 5 telephone numbers, each offering a different service:

- | | |
|----------------|---|
| - 0100 2288 | - Standard calls in Finland |
| - 0100 2299 | - Cell phone calls and calls to Sweden |
| - 0600 92288 | - Information service (subject to a charge) |
| | - International calls |
| - 0700 98695 | - Maintenance service (subject to a charge) |
| - 0800 30 2288 | - Phone calls to toll free service numbers |

0600 92288 also operates as a so called express line when all of the operator's lines are busy. It can be used to request one phone call through this line. The call will be connected by the first available operator.

The services are financed from government related sources.

There is also a trial of sign relay services.

5.9 France

A couple of sign and text relay services are starting up in France in expectation of government related funding. They are both based on SIP videophone and total conversation protocols.

A remote sign language interpreting service is available regionally through information kiosks under the Websourd initiative.

The services are funded through various project financing, and expect to move to some form of government funding or government coordinated funding during 2009.

5.10 Germany

A German company Tess offers two relay services, TeScript and TeSign.

The relay services are available 7 days/week from 08.00 to 23.00.

TeScript offers a text relay service for textphones over the PSTN to the EDT standard. To use this service:

- A textphone user dials 01805-83 77 83.
- A telephone user dials 01805-83 77 88.

A web based service is also available via TeScript to PCs equipped with special software for internet based real-time text.

TeSign offers a Web based signing service using a computer with downloaded software.

The connection is established over the Internet using a password. The service is only available to registered users.

To make a call to a signing user, a telephone user dials 01805-83 77 99.

There is a basic registration charge of 5 €/month. Above this charge:

- TeScript calls cost 0,28 €/min.
- TeSign calls cost 0,14 €/min.

Calls to either service from a telephone user cost 0,14 €/min.

The services are partly funded by the users, partly by the telecom operator.

5.11 Greece

In Greece there is a text relay service which operates on a 24-hour/day basis with local charging which is provided by OTE, the national telecommunications operator.

The line has been operative since the beginning of year 2000, via the OTE Call Centre and provides service to people with hearing problems. It is reached through a special number, 18855

OTE also provides textphones and special handsets for people with hearing problems. They are available at all OTE Shops .

5.12 Hungary

No information at present available.

5.13 Iceland

Iceland has closed its text relay service, and currently no relay service is available.

5.14 Ireland

In Ireland there is a national PSTN based text relay service which is available on a 24 hour/day basis. It is compatible with the V.21 based Minicom textphones. Customers can reach the operator by calling on one of the following freefone numbers:

- Minicom users dialling a hearing person: **Freefone 1800 207 900.**
- To dial a Minicom user: **Freefone 1800 207 800.**
- Minicom users dialling the emergency services: **Freefone 1800 207 999.**

The service is funded by the major Irish Telecom operator Eircomm.

5.15 Italy

In Italy there is no National textphone relay service but a number of relay services are provided by regional or provincial governments. Services are free and they are usually provided on a sub-contracted basis by one of a small number of specialized service providers. Details of the services provided vary somewhat from region to region. Relay services are generally available for textphones but also for instant messaging (chat), e-mail, SMS, Fax and signing (Videochat) on an experimental basis.

The services are generally contacted via a regional "green" 800 Number and are commonly available between the hours of 08.00 and 20.00 from Monday to Friday, and from 9.00 till 12.30 or 14.00 on Saturday. Emergency service is available 24 hours a day every day including Sunday. Some areas have shorter hours of availability.

The relay service of Rome can be taken as an example.

It is available at number 06 5115063 for voice telephone users, and 06 5110943 for EDT Textphones (Called DTS in Italy). It is also available for Fax at 06 51607355, and for SMS at 33873 96 714.

The opening hours are Monday-Friday 8.00 - 20.00 and Saturdays 8.00 - 13.00.

5.16 Latvia

At the time of writing the present document there are no relay services in Latvia.

5.17 Lithuania

At the time of writing the present document there are no relay services in Lithuania.

5.18 Luxembourg

At the time of writing the present document there are no relay services in Luxembourg.

5.19 Malta

At the time of writing the present document there are no relay services in Malta. One was available earlier, but closed down.

5.20 Netherlands

In the Netherlands a text relay service is provided by KPN, the largest fixed-line telecommunications company in the Netherlands. The service, named "KPN tekst telefoon dienst", connects to users with DTMF based textphones.

It provides a 24 hours a day service at specially reduced rates of 0,10 € per minute for fixed network calls.

A single number, 0900 8410 is used for calls to and from textphones and voice phones.

Calls to mobile voice phones are possible by calling 0900 8614. In this case the textphone users pay 0,45 € per minute.

There is a special number for textphone users for emergency service calls. (0800-8112).

The service is partly funded by the operator and partly by the user. KPN is planning to modernize the Text telefoon dienst in 2009.

5.21 Norway

In Norway, The Post and Telecom Board (the Norwegian regulator) sets the requirements and the largest Telecom operator is required to provide text relay services.

A Text relay service, run by Telenor is currently in operation, with access for V.21 based textphones.

It is open 24 hours per day, and financed by Telenor. The access number for textphones is 146.

A Sign relay primarily intended for users at work is provided by the Norwegian Labour and Welfare organization NAV.

It is open workdays 8.30 to 15.00 and provides access for SIP videophones.

5.22 Poland

At the time of writing the present document there are no relay services in Poland.

5.23 Portugal

At the time of writing the present document there are no relay services in Portugal.

5.24 Romania

At the time of writing the present document there are no relay services in Romania.

5.25 Serbia and Montenegro

At the time of writing the present document there are no relay services in Serbia and Montenegro.

5.26 Slovakia

At the time of writing the present document there are no relay services in Slovakia.

5.27 Slovenia

At the time of writing the present document there are no relay services in Slovenia.

5.28 Spain

The Spanish relay service is provided and funded by the Ministry of Labour and Social matters.

It offers a 24 hour/day 365 days/year national service which is available to any textphone user. All calls are charged at local rates. Text - to- text calls between the different kinds of textphones are also supported.

There are different telephone numbers for the various services:

- Ordinary telephone users: 901 558 855
- DTS text telephones (EDT): 901 551 010
- DTS text telephones – emergency calls: 900 211 112
- AMPER text telephones (V.23): 901 568 866
- SMS: 610 444 991
- Fax: 901 515 011
- Videoconference: 913 750 498

5.29 Sweden

In Sweden three relay services are available for people with disabilities and their counterparts.

A text relay service is available which provides traditional text relay (V.21, with VCO and HCO), web based text relay, fax relay and a limited SMS relay.

A number of operators are offering V.21 gateways which allow IP based and mobile packet based terminals to connect to text telephones and to the text relay service.

A sign relay service for video telephony is provided by Orebro County Council. The service provides video relay for SIP videophones, web client, H.323 videophones [i.10], ISDN/H.320 and 3G Circuit Switched video calls. A message based text communication is available during the relay calls. The service is also compatible in video and audio with SIP based total conversation terminals.

A speech to speech relay service, Teletal, is provided by Verbaldigitalius. The service provides a speech to speech relay service for people with speech impairment, general support for cognitive impaired people during the conversation and summaries of the conversation for people that cannot take notes because of their disability. The service is provided as a three party call.

The services are specified and procured by the National Post and Telecom Agency (PTS), the national telecom regulator in Sweden. The services are financed by national taxes. In Sweden the county councils, the labour authorities and the social insurance system procure text telephones, video telephones and total conversation units and provide them free of charge for people that need them. The relay services are required to be interoperable with all of the products and services offered by these authorities and may additionally offer interoperability with other types of terminals.

A trial project is currently evaluating new ways to address the relay services. The project is called Call direct, and permits direct dialling of the destination's number or address, with the call routed automatically through the relay service.

One provider has text gateway support between V.21 textphones and SIP terminals with real-time text according to RFC 4103 [i.8].

One provider has text gateway support between V.21 textphones and IP terminals with proprietary real-time text format.

A project offers a text gateway service between a web based real-time text service, a mobile phone based service and V.21 textphones.

5.30 Switzerland

In Switzerland a text relay service is available for users of EDT text telephones in the telephone network and for users of the short message service SMS for mobile phones. The service is run by Procom and is available 24 hours a day. It is operational for the three main languages: German, Italian and French.

The service is financed jointly by the telecom operators under a law for equal service provision to people with disabilities.

5.31 United Kingdom

Textphone users in the UK can use a service funded and provided by BT called TextDirect. Calls are made by dialling a prefix (18001) followed by the full national or international number of the required subscriber. All call progress information is provided in text form. The service is subsidized in recognition that it takes longer to type a conversation using a textphone. The service will operate with any textphone compatible with V.18 except those using DTMF.

If the call is answered by a textphone, the call can proceed. If not, the text relay service is automatically invoked. Voice and hearing carry over are both available and the operators can leave voice or text messages on answering machines. This relay service is provided by Typetalk under contract from BT. To call the emergency services, a textphone user dials 18000 instead of 112.

A user of an ordinary telephone who wishes to call someone using a textphone can invoke the relay service by using the prefix 18002.

Service are available 24 hrs/day, 7 days/week.

The service is financed by BT, in agreement with Ofcom, the telecom regulator.

No dedicated facilities are provided for speech impaired users. Deaf/blind users can communicate with the relay service using a textphone with a Braille display.

One supplier (Significant) is providing a signing relay service over the Internet. This service is provided on a purely commercial basis and most users are funded through their employment and labour authorities.

One commercial supplier (RNID) provides a service which can make or receive calls over the Internet from textphones, and connects them through a gateway to any Windows computer on an office network using SIP with RFC 4103 [i.8] for real-time text. It also provides a breakout service to the PSTN that permits connection to textphones that are members of the V.18 family.

Another provider (DSPG Ltd) has a system whereby an organisation can receive calls over a telephone line from any textphone that is a member of the V.18 family and can connect them through a gateway to any networked PC within the company using a proprietary protocol for real-time text.

One supplier (WebCapTel) used to provide a captioned telephony service utilizing a telephone and a PC on an Internet connection. This service was provided on a purely commercial basis and most users were funded through their employment. The service is now discontinued.

6 Relay service internationally

6.1 General

Relay services are known to be provided in a number of countries outside Europe. Some are listed here, including their main characteristics.

6.2 Australia

Australia has a text relay service that provides service to users of textphones with the TIA-825-A [i.15] standard at 50 bits/second. It is available 24 hours per day. The service is government funded.

6.3 Canada

Canada has text relay services that provide service to users of textphones with the TIA-825-A [i.15] standard at 45,45 bits/second. It is available 24 hours per day.

Text users call 711 to access the service.

Voice phone users call 1-800-855-0511.

The service is provided by Bell Canada, and financed partly by charges on all Bell Canada telephone bills, and partly by government related sources, such as the ministry of health.

6.4 New Zealand

New Zealand has a text relay service that provides service to users of textphones with the TIA-825-A [i.15] standard at 50 bits/second. It is available 24 hours per day. The service is government funded.

6.5 USA

Telecommunication Relay Services (TRS) are provided in USA by regulation from the Federal Communications Commission (FCC). The services are provided 24 hours a day.

The following types are available:

- Video Relay Services, VRS, providing sign relay services to users with videophones with ITU-T Recommendation H.323 [i.10] and SIP [i.7] multimedia protocols. Some support voice in outbound direction and signed language receiving; some support deaf-blind users with signed language for expression and text inbound to the deaf-blind user. Although not required, videophones are usually provisioned by the video relay service provider. Service options are growing quickly in this sector.
- Text relay services, providing text relay services to users of textphones in the PSTN, using the TIA-825-A [i.15] textphone standard at 45,45 bits/second, as well as Bell 103 modem based devices (called "ASCII"). These relay services can be accessed by all PSTN users by dialling a reserved short code, 711. Services include two-way text, voice carryover and hearing carryover. All are required to handle 911 (emergency) calls if requested and to pass the phone number through for automatic location identification.
- IP-relay, providing text relay services to users of Web or IP based terminals. Most of them provide a choice of a real-time text interface, or message based.
- Instant-message style relay services, used widely for mobile calls. For inbound calls, a public-number-plan number is provided to the deaf user. Voice calls to the user's number are routed to the relay service and the relay service identifies, using the "presence" feature in IP, whether the user is online and available for the call.
- PSTN and IP Captioned Telephony, providing captioned telephony services to users with specialized phones or IP based terminals.

- Speech-to-speech services, providing re-voicing speech relay services to people with voice telephones and three-way calling service.

On the 31 December 2008, a regulation takes effect that requires providers of video relay services and IP text relay services to provide phone numbers from the public number plan to the users, in order for them to be callable from voice telephone users via the relay service by their own number. It also requires that Video relay service users are able to use the same number for calling each other without invoking the relay service, forcing the relay providers to assure compatibility between the terminals.

The regulation also requires relay service providers to give priority to emergency calls to the emergency number 911, and to provide user position information to the emergency services with these calls.

The PSTN based text relay services are procured by each state and funded jointly by the operators.

The other relay services are funded jointly by long distance telecom operators, cellular, and Voice over IP-to-PSTN operators, through a procedure managed by the FCC.

6.6 Multi-national

A commercial text relay service providing services in a number of European languages is available under the name European-Relay in some European countries and some countries worldwide.

It offers a message oriented text relay service through a web interface for customers in Australia, Canada, France, India, Ireland, Italy, New Zealand, Spain, the UK and USA.

7 Service offerings summary for Europe

7.1 Text Relay Service

Country	Access arrangements
Belgium	Internet message based text relay service
Denmark	PSTN based V.21 and Web based real-time text
Finland	PSTN based using V.21
France	IP SIP based, project
Germany	PSTN based using EDT and Web based real-time text
Greece	PSTN based using EDT
Ireland	PSTN based using V.21
Italy	Various local systems using EDT and SMS
Netherlands	PSTN based using DTMF
Norway	PSTN based using V.21
Spain	PSTN based using EDT and V.23
Sweden	PSTN based using V.21, web based text relay with real-time text, fax relay
Switzerland	PSTN based using EDT protocol
United Kingdom	PSTN based using V.18

7.2 Sign Relay Service

Country	Access arrangements
Denmark	Sign relay using SIP videophone, project
France	Sign and text relay for SIP softphone, projects
Germany	Sign relay using proprietary softphone, project
Norway	Sign relay for SIP video softphone mainly at work
Sweden	Sign relay for SIP, web client and 3G Circuit Switched video
UK	Sign relay for H.323 in the workplace

7.3 Speech Relay Service

Country	Access arrangements
Sweden	Speech relay with voice phones

7.4 Captioned Telephony Relay Service

No Captioned Telephony is known to be offered in Europe.

7.5 Text-to-text relay services

The harmonized relay service standard refers to services that allow users of different kinds of textphones or real-time text capable terminals to communicate. Such services are usually automatic and are usually called gateways.

The following such services are known to exist in Europe.

Country	Access arrangements
Spain	Text-to-text relay service between V.23 and EDT textphones
Sweden	Text gateway between V.21 textphone and SIP with RFC 4103 [i.8]
Sweden	Text gateway between V.21 textphone and proprietary IP formats
Sweden	Text gateway between V.21 textphone and web based and mobile (project)
UK	Text gateway between textphones of various kinds under the V.18 standard
UK	Text gateway between V.18 including submodes and SIP with RFC 4103 [i.8]
UK	Text gateway between V.18 including submodes and proprietary IP format

8 Quality of Service (QoS) criteria

8.1 General

The goal of relay service provision is to make telephony functionally equivalent as far as is feasible for people with disabilities. Within that goal lies the need to meet service performance expectations. Examples of factors to consider when studying QoS criteria are for example:

- Answering time from an incoming call until the call is answered and at least an automatic message is given acknowledging that the call has reached the service.
- Response time from an incoming call until the service is prepared to handle the call, including being prepared to let the call reach the destination and start the mode translation.
- Availability: The percentage of total intended operational time that the service really is operational and ready to meet requests for service within the assigned performance goals.
- Opening hours: The time limits when the service is available.

Full functional equivalence with telephony would require the answering time and the response times to be substantially zero. That would in turn require a very high number of operators, and many operators sitting idle, prepared to handle calls. This would cause high costs and low job satisfaction. It is obvious that a balance needs to be found between performance requirements and feasible resource usage on the service.

When the relay service is invoked through directly dialling the destination number, the calling user often has no expectation that the call will go through a relay service. The willingness to accept a waiting time for the call to be answered by the destination user is thus equal to what it would be in a direct call. In direct calls, most telephone users expect to get an answer within 20 seconds to 30 seconds.

If calling users are met by a message telling that they are connected and are asked to wait, then they are prepared to accept a longer wait for a response from a live operator.

Thus, although any delay is undesirable, the inevitable extra delay caused by having a relay service included in a call can be tolerated by a majority of the callers if the extra waiting time is shorter than what they normally would expect to wait for a call to complete. If the call is answered with an appropriate message during the extra waiting time, an added time shorter than 30 seconds seems to be a generally acceptable figure.

This reasoning should be kept in mind when specifying the answering time requirements on relay services.

8.2 Examples of QoS requirements

8.2.1 General

When researching background information for the standard it proved extremely difficult to obtain details of the QoS requirements contracted to be provided by the service providers. In general such information was only available when service procurement was put out to competitive tender in such countries as Sweden and the USA. In countries where the responsibility for relay service lay with a national service provider the QoS requirements were treated as private commercial information and were not readily available.

It was only possible to propose figures for drafts of the standard and await objections from service providers.

A few documented performance requirements are provided here as a background to the figures introduced in the relay service standard.

8.2.2 Sweden

The answering time requirements for the public Swedish sign relay service was specified in the latest procurement documentation to be a maximum of 40 seconds for 70 % of the cases and a maximum of 90 seconds for 90 % of the cases calculated per month and calculated from the incoming call to when the outgoing call is placed.

The answering time requirements for the public Swedish text relay service was specified in the latest procurement documentation to be a maximum of 20 seconds for 90 % of the cases between hours 0600 and 2100 hrs and a maximum of 40 seconds for 90 % of the cases between hours 21.00 and 06.00 hrs calculated per month, and calculated from the incoming call to when the outgoing call is placed.

8.2.3 USA

The minimum performance requirements and other rules for relay services in USA are documented by the FCC in 47 Code of Federal Regulations (CFR) [i.16] Title 47, part 64.601 to 606 (the TRS Rules). Section 604 defines the minimum performance requirements.

Text relay services are required to have an answering time of less than 10 seconds for 85 % of the cases measured per day and calculated from an incoming call, to when the call is being responded to by a human operator.

Sign relay services are required to have an answering time of less than 120 seconds for 80 % of the cases measured per month and calculated from an incoming call, to when the call is being responded to by an interpreter.

8.3 Conclusions

The examples above show significantly longer acceptable waiting times for sign relay services than for text relay services; 90 and 120 seconds for sign relay services versus 20 and 10 seconds for text relay services. This difference cannot have any relation to user acceptance, especially not for calls from voice telephone users, where the users often do not know that the call will pass a relay service. The big difference in requirement arises from an acceptance of the reality that sign language interpreters are a scarce resource.

The setting the total response time in the harmonized standard to 20 seconds during daytime working hours is the result of a balanced judgement taking into account common phone user behaviour and good use of resources.

Annex A: Bibliography

The following reports, specifications and regulations provides information that is relevant to the topic of the present document. They have either provided valuable background for the standard for harmonized relay services, or can be studied for wider views of the topic. A very brief comment is provided with each reference.

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History

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