



# Real-time Text Update + Implementations based on TEITAC Recommendations

## Rehab Engineering Research Center on Telecommunications Access



# Introductions

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# Importance of Real Time Text

## TTY is reaching end of life

- Foreign on any data networks. Doesn't work well on Internet
- Only one-way communication at a time
- Won't support captioned telephony

## VoIP network is being built-out now

- If we don't act soon – the new VoIP networks and technologies will be deployed without good cross-disability text support - and it will be very difficult and expensive to retrofit anything that will work reliably.
- Rarely do we get an opportunity to act at the beginning of a technology revolution - to get access built-in when it is easier, and can become part of standard implementations – rather than patched on an unreliable.
- We are already getting pressure from those who want to implement.

# Text is not just for Deaf-to-Deaf Communication

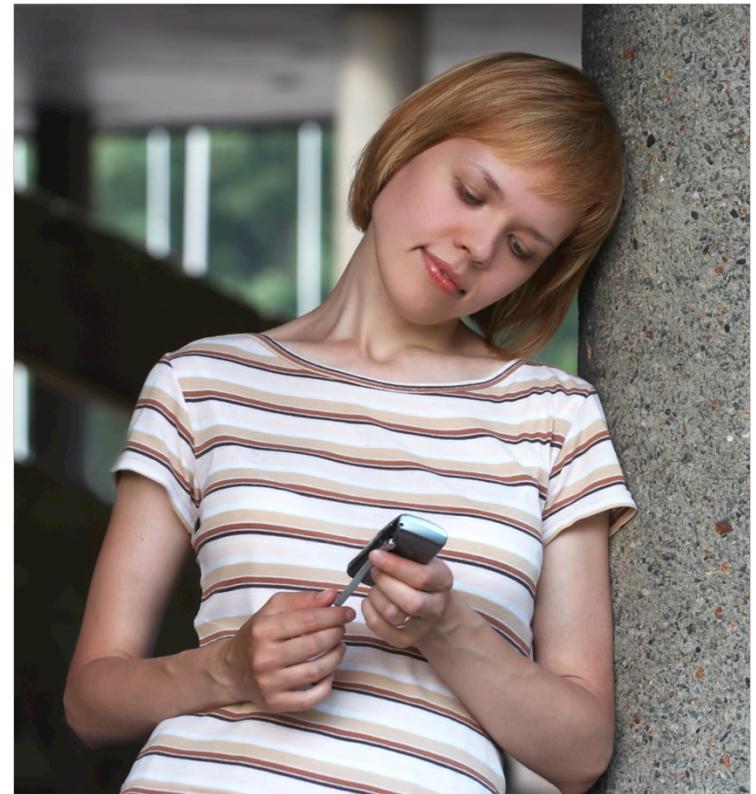
Text is used by many different types of users

- Deaf
- Hard of Hearing
- Deaf Blind
- Impaired Speech
- + People without disabilities (talking to any of the above).

Text is used in many different ways for telecom

- Text in both directions
- Text in one direction and speech in the other
- Text used to caption speech on the phone
- Text used to supplement the speech when hard to understand

# Text can be used between two people who are deaf.



**Or, used with speech to allow hard of hearing Elder to talk (voice) to grandchild who types back as she talks.**



# Or to allow a person using Aug Com Aid to talk to hard of hearing parent.



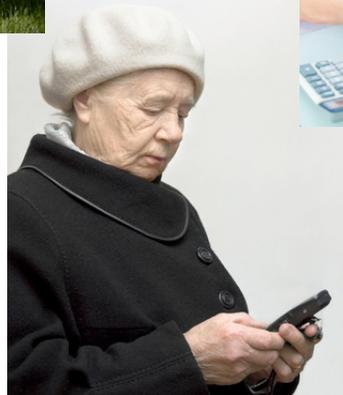
**or allow a deaf person to order pizza using  
real-time text, their cell phone and a relay service**



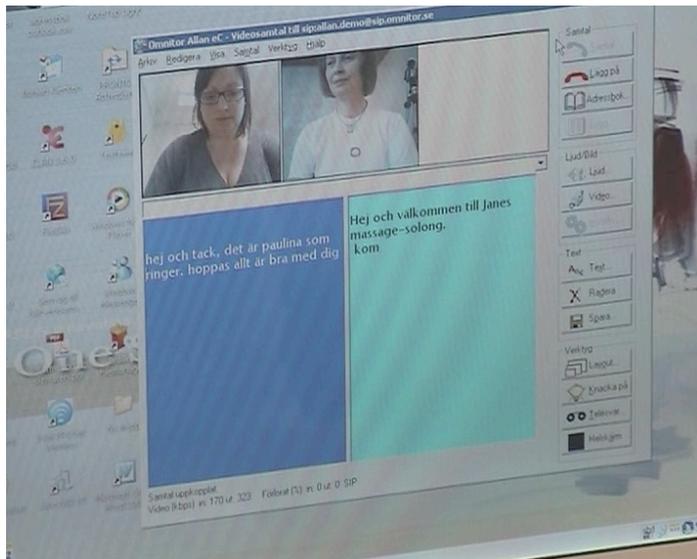
**(or, in future, send text directly to  
display of phone at Pizza Shop)**



# Real-time text can allow those without clear hearing (or speech) to call 9-1-1 from whatever is handy – and communicate reliably.



# It can allow a deaf-blind person to talk to her clients via text and a Braille display



# And can allow people who are hard of hearing to use Captioned Telephony on any phone with a display



# Different Types of Text Communication

**Email: Good for long messages - especially with attachments.**

Easier to store and refer back to.

**SMS: Good for short messages.**

Only 140 characters long. Delivery can be quick or several minutes later.  
Delivery not guaranteed.

**IM: Good for chatting but incompatible.**

Active connection. Delivery is instant (at end of utterance) and confirmed delivery (or not). Message like. Ubiquitous Slower than real-time.\_

In a rush, it can lead to crossed messages, causing stress and misunderstanding.  
Can't be used for captioning telephone calls (e.g. CapTel). IM services are incompatible with each others.

**Real-time text: Good for intensive conversations and is part of telecom.**

Delivery is instant and continuous (like speech). Fastest for active conversation.  
Most natural - like speech or signing.

Best for clear communication and emergency communication. Only form that supports captioned telephony.

Built on international standards. Natural part of telecom. Can look and feel like IM or SMS if user desired.

## To meet the needs for of people with different disabilities text conversation must:

1. Be Reliable on IP networks
2. Be Interoperable (as voice is)
3. Be able to mix with speech – on same call
4. Flow in real-time
5. Be supported on phones
  1. If phone already has a display – it should display RTT it gets
  2. If phone already has text entry for other purpose it should also be usable to send RTT
6. Have a common format for interconnection

## TEITAC language covers all 6

### Wherever there is speech there must be

- Reliable, interoperable real-time text, not using tones and allowing speech and text to be mixed.
- Any format OK as long as it is used throughout the system and supports inter-connection using a single common interconnection format.
- Three candidates for the common interconnection format were mentioned; RFC-4103, TIA 1001, and MSRP (RFC4975)

### IP terminal devices that provide voice communication

- **If it has a display** – it must display any real-time text sent to it.
- **If it can generate text** (for some other reason) then it must allow use text input mechanism for real-time text communication.
- **If it doesn't allow both** sending and receiving then system needs to allow connection of an alternate text communication device.

(Based on assumption that FCC relieves terminals of TTY requirements)

## Left to do

- A) Select the common interconnection format
- B) Adopt the TEITAC/AB provisions for 255
  - Harmonize with 508
  - Update for modern technology
- C) Get all IP companies to build products and systems implementing it

## So where are we on these 3 ‘to do’s ?

### Of the three candidate standards mentioned in TEITAC

1. **MSRP (RFC4975)** – a messaging standard: The standards group is no longer discussing real-time text as a capability
2. **TIA 1001** – is a US gateway standard (used between gateways in PSTN networks) and no terminal equipment is supporting it. Not recommended by any international standards nor the next generation 9-1-1 committees.
3. **RFC 4103** – is an international standard developed specifically for real-time text. It is implemented in multiple commercial products with more companies planning implementations. It is cited in international emergency planning documents and standards as the standard to use for real-time text.

### Now have implemented examples of all of the TEITAC recommendations.

- There are real-time text implementations (RFC 4103) in all of the following categories (cell phones, desk phones, soft phones, open source SIP-PSTN gateways, VoIP reference designs).



## Importance of selecting a RTT common interconnection format now

- **If nothing is chosen – then there will be no progress.**
  - Companies cannot afford to move forward with real-time text and built it into products without knowing which format will be chosen.
  - If there is no common format required then there is no interoperability
  - People in companies who want to support text communication for people with disabilities are complaining that delaying for much longer will mean it won't show up in products for 5 – 8 years and be too late for VoIP infrastructure build-out.
- **Cannot provide FCC waiver on TTY without an IP text alternative to take its place.**
  - This would force companies to build TTY coupling into products, which today is increasingly useless (or ignore rule and not support text at all).

## RFC 4103 best (only viable?) candidate for the common interconnection format

- Only mature standard
- Only international standard for Real-time text
- Has commercial and open source support
- Is the specified standard for real-time text in international next generation emergency systems
- No other candidates for common interconnection format are being pursued actively. No implementations across industry sectors or countries.

Remember that companies CAN use any other reliable real-time text format in their systems – as long as they can connect to the common format at their borders for interop.



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# Demonstrations of RFC 4103

## Different users – different needs

As we mentioned earlier,  
there are different users for real-time text  
and different ways it can be used.

We will be showing a number of them.  
In each case we will talk about the different uses.

Feel free to ask questions.



# Demonstration of RFC 4103

## On Computers

(also text to supplement sign)

- Anyone with a computer and the skills to use it
- Low cost or free “Softphone” applications allow ‘total conversation’ on any computer.
- No special equipment needed for friends and family

# Demonstration of RFC 4103

## Any (VoIP) Phone with a display

- HoH person calls (or is called) through a relay.
- Full access to call anyone in the world.
- No special equipment (or stigma). For older HoH person it is a simple phone call on standard (VoIP) phone

# Demonstration of RFC 4103 on Cellular Phone (VoIP)

- Convenient anywhere communication
- Text can be used when noise prevents accurate voice communication
- Family, friends and caregivers can use their standard phones to communicate with people having all the different types of disability that require text in conversation

# Demonstration of RFC 4103 plus Braille Display with a Deaf Blind user



- A deaf-blind person can use computer with Braille display to talk to friends and strangers.
- With friends they can type or use video to sign - and use text and Braille to read incoming conversation.
- With strangers they can use text or sign language to a relay service (that talks to others) and they get text back from the relay service that they display on Braille display.



# Demonstration of RFC 4103

## for Hard of Hearing in Emergency Situation

- Whether calling 9-1-1 or someone else to help – people who are hard of hearing can use the closest phone and have get accurate information.
- Works if hard of hearing, or if noisy environment, or both.



# Demonstration of RFC 4103

## with Captioned Telephony

- Ability for people to use any phone and invoke captioned telephony.
- No proprietary equipment.
- No stigma.



# Demonstration of RFC 4103

## Compatibility with TTY

- Anyone can use computer or phone to call people who still use a TTY (due to analog line or need for simplicity).
- Gateway does translation
- Result – anyone can call TTY users from wherever they are without having to buy a TTY or carry it about with them.



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**Text support on all phones  
benefits EVERYONE  
(not just those with a disability)**

# Using text when too noisy for Speech

Person comes upon a person lying in the street near in a construction zone.

He calls 9-1-1 but can't hear other person.

He keeps trying but just can't hear

Then he remembers he can communicate in text and switches to that.





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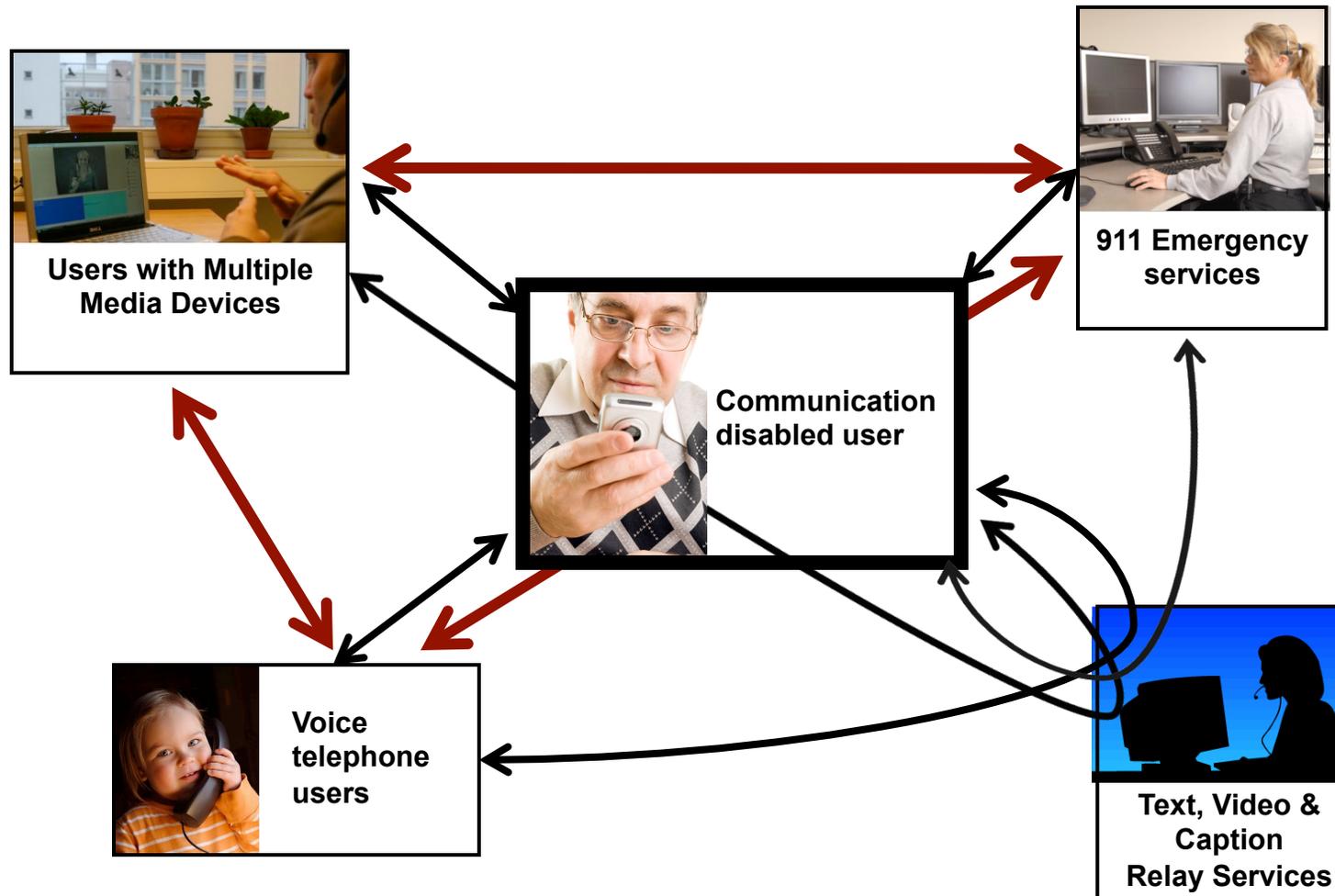


# Using real-time text with Voice Mail

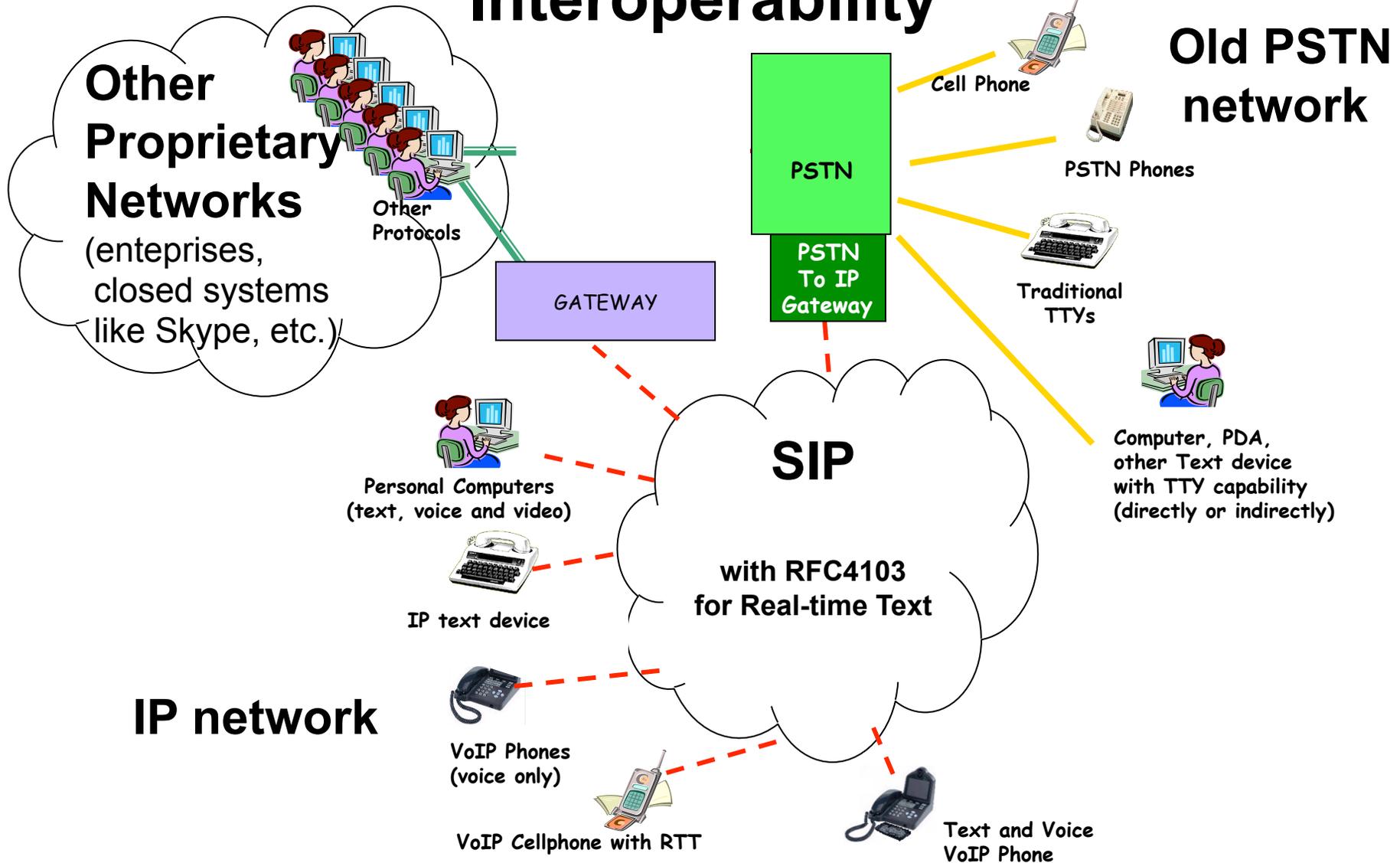
# Using Real-time text to speed up IVR Voice Menus

Since RTT would be built into every phone and cell phone – in the future people could just look at the screen of their phone and get through voice menus much faster – without having to wait while the choices are slowly read to them.

# Communication paths



# Real-time Text Interoperability



# Summary

1. Many different types of Text users - with different needs and devices
2. RTT needs to be interoperable across different devices AND services
3. Industry needs flexibility within their systems (and TEITAC Language allows this)
4. All systems need to support a one common text transport format - or there will not be reliable interoperability. (and TEITAC language requires this)
5. Companies cannot proceed to implement Real-time text until the required common standard is known.
6. Real-time text needs to be built into the emerging VoIP infrastructure now or it will be very costly and unreliable later.
7. An international Industry Standard for Real-time text (RFC 4103) exists and is the only standard that has support across technologies.
  - It has been specified as the standard for real-time text in next generation (IP) 9-1-1 systems.
  - It has been demonstrated working across cell phones, desk phones, softphones, and gateways as well as ability to work with video, text and captioned relay services.



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