

<this area for real time captions>

EAAC TTY Transition

Draft report from the
EAAC TTY transition group
14 September 2012
Gunnar Hellström, Omnitor



<this area for real time captions>

TTY Transition charter and background

- The TTY Transition group works with TTY related goals of the main EAAC charter.
- ***EAAC Provision: Deadlines by which interconnected and non-interconnected VoIP service providers and manufacturers shall achieve the actions . . . where achievable, and for the possible phase out of current-generation TTY technology to the extent that this technology is replaced with more effective and efficient technologies and methods to enable access to 9-1-1 emergency services by individuals with disabilities.***
- The EAAC submitted a set of recommendations in December 2011 used as starting point and framework for the TTY Transition group.



<this area for real time captions>

TTY transition EEAC background

•**Recommendation P6.1: No TTY Phase-Out Deadline for PSAP:** The EAAC recommends against imposing any deadline for phasing out TTY at the PSAPs until the analog phone system (PSTN) no longer exists, either as the backbone or as peripheral analog legs, unless ALL legs trap and convert TTY to IP real-time text and maintain VCO capability.

•**Recommendation T6.3: Baudot (TTY) Support:** The EAAC recommends that Baudot (TTY) be supported by all PSAPs with VCO and HCO capabilities until there are no more TTYs in use – or until there is a gateway between every TTY user and the PSAP, that converts TTY into the proper real-time text format for VoIP systems supported by the PSAPs including support for VCO/HCO functionality. ...



<this area for real time captions>

TTY transition EEAC background

- **Recommendation T2.2: Removal of TTY Requirement:** The EAAC recommends that the FCC remove the requirement for TTY (analog real-time text) support for new IP-based consumer devices that implement IP-based text communications that include, at a minimum, real time text [*in the same call*] or, in an LTE environment, IMS Multimedia Telephony that includes real-time text [*in the same call*]. The text must be possible to use in parallel with voice on the same call so that VCO equivalence is maintained.



<this area for real time captions>

TTY Transition work plan

- The TTY transition group agreed to produce a report providing insight and advice on critical factors regarding TTY transition.
- The report was planned to be ready 14 September 2012.
- It is now available as draft – result of work in progress.
- Draft is available in EAAC Wiki, in section for TTY Transition.
- <http://eaac-recommendations.wikispaces.com/TTY+Transition>
- Final report is now proposed for December 2012
- Next step: Internal review and handling any comments.



<this area for real time captions>

TTY transition group

- Chair: Gunnar Hellström, Omnitor and Paul Michaelis, Avaya Labs.
- Toni Dunne, Intrado
- Cheryl King, FCC
- David Dzumba, Nokia
- Matt Gerst, CTIA
- Robert Mather, DoJ
- Richard Ray, NENA / LA City
- John Snapp, Intrado
- Al Sonnenstrahl, CSD
- Arnoud VanWijk, R3TF.org
- Gregg Vanderheiden, Trace Center
- Norman Williams, RERC Telecommunications Access, Gallaudet University
- Joel Ziev, Partners for Access



<this area for real time captions>

TTY Transition report structure

- Goals and background
- The current situation of TTY and other accessible communication.
- Reasons to leave TTY, keep TTY, create TTY replacement
- Transmission problems and remedies for TTY in modern networks
- Functional goals of a TTY replacement
- Technologies ready for TTY replacement for user-user and 9-1-1 calling.
- Interoperability between TTY and TTY replacement
- Mainstream vs Accessible solutions. Can the gap be closed?
- Policy overview. Change and synchronization needed.
- Recommendations
- Influenced entities
- Timeline



<this area for real time captions>

The current situation

- The TTY enables a limited functionality for intermixed voice and real-time text, integrated in the telephone network.
 - Slower than rapid typing, limited character set, only alternating text and audio, no popular wireless solution
- Some important features are not yet provided by any other widespread solution in USA.
- Estimation 100 000 users in USA.
 - 20 000 9-1-1 calls per year
 - 18 M calls per year user – user and relay
- Communication problems in VoIP networks



<this area for real time captions>

Reasons to keep or abandon TTY

- Reasons for users to keep the TTY
 - It allows intermixed voice and text. Important for Hard-of-hearing, speech-disabled, 9-1-1 etc.
 - The only direct link to 9-1-1
 - Robust, always ready
 - Have not bothered to look for other solutions
 -
- Reasons for users to abandon TTY
 - Limited mobility
 - Fewer people use it.
 - Videophones replaced it.
 - Many alternatives are available even if not providing same functionality.
 - ...



<this area for real time captions>

Specific solutions for persons with deafblindness

- NDBEDP program for supporting deaf-blind communication.
 - Distributes among other things TTYs with assistive technology.
 - Need to be synchronized with TTY replacement so that new communications technology for deafblind people is interoperable..



<this area for real time captions>

Transmission problems

- Problems if attaching TTY to VoIP network.
 - Sensitive to packet loss. Already 0.12% loss creates 1% character loss.
- Coding and audio handling
 - Makes TTY tones unclear and can cause corruption and loss
- Echo cancellers optimized for voice
 - May malfunction in presence of TTY tones and cause corruption and loss
- Problem level not known.
 - More research needed
- Makes good replacement desirable



<this area for real time captions>

Requirements on a TTY replacement

- Smooth and rapid text communication
- Simultaneous voice
- Full character set.
- Wireless and fixed
- Robust transmission
- Use existing standards for rapid deployment
- User-user, relay, ng9-1-1
- Multi-party calls
- TTY interoperability
- Interoperable with videophones with text



<this area for real time captions>

Proposed technology

- Depending on call control environment
- Native SIP (often used for VoIP)
 - Common audio codecs, e.g. G.711
 - T.140 / RFC 4103 RTP based real-time text
- Wireless and IMS , LTE and VOLTE
 - IMS Multimedia Telephony
 - (using the same real-time text standard)
- Also specified for ng-9-1-1 access in RFC 6443 and NENA i3 technical specification



<this area for real time captions>

Implementation in other technologies than SIP and IMS

- Providers in other call control environments may use any real-time text transport specification available for the environment.
- They need to convert to SIP and RFC 4103 and audio in order to provide ng-9-1-1 access and interoperability.
- One protocol even mentioned as a possible extension on the NG-9-1-1 support is XMPP
 - Work in progress to create a standard for real-time text based on XMPP.
 - Huge work to have one more protocol than SIP all way in to the PSAP. More likely that it needs to be converted to SIP also in the future.



<this area for real time captions>

Interoperability

TTY – TTY replacement

- Conversion between TTY and TTY replacement is no big technology challenge. Easily done in gateways and multifunction terminals
- But to get it in the call path where needed is a challenge.
- The report provides proposals and recommendations, all with some drawbacks.

<this area for real time captions>

The mainstream – accessibility gap

- Mainstream text services are attractive because they reach many users.
- Accessible text services are attractive because they provide suitable functionality.
- The goal is that mainstream services shall be accessible and fully functional. Or that the accessible services shall render mainstream acceptance.
- Without that, both mainstream and accessible services continue to provide limited functionality.



<this area for real time captions>

Making TTY replacement a mainstream feature

- In the work with TTY replacement there should be efforts to make its main features mainstream.
 - Base it on mainstream technology
 - Make it attractive to mainstream users
 - Trial it with mainstream users.
 - Launch it within mainstream providers.
 - But do not give up on accessibility features.

<this area for real time captions>

Regulation support

- If possible, synchronize with Section 255/508 refresh by Access Board NOW. They define mandatory features of communication products and services.
- What is required of communication products is also what should be supported by ng9-1-1.

<this area for real time captions>

Regulation support

- Relax PSTN TTY connection requirement for products implementing TTY Replacement.
- But maintain the interoperability requirement if feasible interoperability approach is agreed.

<this area for real time captions>

Entities influenced

- TRS providers
TTY producers
Standards organizations
Telecom Equipment Distribution Program
- National DeafBlind Equipment Distribution Program
NENA
- PSAPs
NG9-1-1
- Mobile manufacturers
- Carriers
- FCC
- DOJ
- Accessibility advocacy groups

<this area for real time captions>

Timeline

- Settle what TTY Replacement is and start deployment within 24 months.
- Do not set a fixed deadline for TTY phase-out if not major communication problems appear during PSTN close down.
- Aim at having all new users on TTY replacement after 7 years.

<this area for real time captions>

Conclusions and Recommendations

- The TTY transition report ends with a set of recommendations extracted from the chapters.
- See <http://eaac-recommendations.wikispaces.com/TTY+Transition>
- One important conclusion is:
Consistent implementation of a well-defined "TTY replacement" with higher functionality real-time text, simultaneous voice and better mobility can fill an important need in accessible communication for user-to-user calls, relayed calls and 9-1-1 calls.

<this area for real time captions>

TTY Transition

EAAC TTY Transition group

Gunnar Hellström

gunnar.hellstrom@omnitor.se

