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ATIS Interim Non-Voice Emergency Services (INES) Report and Recommendations

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Abstract

This report documents the ATIS Interim Non-Voice Emergency Services (INES) Incubator efforts to perform a technical review of commercially available text-based communications solutions to enable emergency communications to existing PSAPs for persons with disabilities by June 30th 2012. From a detailed evaluation of a variety of possible candidates, the report recommends IP Relay as the best interim solution candidate for non-voice emergency communications on mobile networks and devices.

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Executive Summary

This report documents the ATIS Interim Non-Voice Emergency Services (INES) Incubator efforts to perform a technical review of commercially available text-based communications solutions to enable emergency communications to existing PSAPs for the persons with disabilities by June 30th 2012. It identifies IP Relay as an approach that is already deployed nationally to address individual needs, but according to Advocate input to ATIS INES, IP Relay is not widely used today in routine communications. It also identifies Short Message Service (SMS) to a national 9-1-1 clearinghouse as an approach that would require significant FCC, and potentially Congressional action, to implement. Due to latency and other technical issues, the use of SMS poses significant risk to individuals' safety and well-being. In addition, SMS is not is compatible with the long-term 3GPP standards-based Multimedia Emergency Services (MMES) solution. Lastly, the clearinghouse will take time and funding to create, staff, and maintain. Should SMS be used, it would likely require significant broadening of the scope of the FCC's current Telecommunications Relay Service (TRS) program.

The deployment of IP Multimedia Subsystem (IMS) on Long Term Evolution (LTE) or equivalent services (referred to as IMS) that comprise MMES for NG9-1-1 on CMRS communications systems is expected to provide integrated wireless voice, text and video capabilities in the long term. Wireless carriers are already beginning their LTE network and handset deployments, and widespread availability is expected within the next 3 to 4 years. Also, Public Safety is in the very early stages of its roll-out of Next Generation 9-1-1 (NG9-1-1) system capabilities, which are expected to leverage originating services LTE capabilities to provide end-to-end 9-1-1 communications via voice, text and video. NG9-1-1 deployment will occur through a phased-in approach and be dependent on local decisions and funding. These advances will enable unprecedented levels of access to emergency communications for persons with disabilities, and will also provide new capabilities to the general public. Achieving these significant improvements will require time, funding and other resources.

In an effort to identify candidate solutions capable of improving the current level of emergency access for persons with disabilities, the ATIS INES examined mobile text-based solutions that could be deployed in the near-term. For the review, ATIS INES targeted June 30th 2012 as a deployment date because this would allow the ATIS INES to focus on candidate solutions that could reasonably be expected to be deployed soon, thus providing short term improvements in emergency access while awaiting more robust improvements promised under IMS and NG9-1-1. Having a fixed target date also forced the ATIS INES to very carefully evaluate the maturity, ease of deployment and complexity of candidate solutions. ATIS INES explored a wide variety of approaches, many of which ATIS INES eventually eliminated due to their impacts on users, PSAPs, carriers, and manufacturers or due to the time needed to complete the standards or integration work necessary before evaluating their suitability for addition to the communications and 9-1-1 networks, with the intent of avoiding potential disruptions to these critical infrastructure elements. It should be noted that other options are available that are perceived to provide a solution with better, more direct emergency text communications, and more effective transition capabilities, but would require longer than June 30th 2012 to prepare and implement nationally. Since the timeframe for national implementation of the long term MMES solution[1] in conjunction with NG9-1-1 availability is a matter of years, interim text methods will continue to be used for years. The ATIS INES recommends that further work to evaluate and establish an improved interim emergency texting solution be considered. The benefits of improving the interim solution should be weighed against the risk of delay in addressing the development of the long term NG9-1-1 solution. At a minimum, however, effort should also be dedicated to identifying how the interim solution will transition to the long term NG9-1-1 solution offering MMES capabilities as they become available.

Early in the efforts, the ATIS INES developed a list of ideal requirements that an interim solution should possess in order to maximize its effectiveness. Critical technical concepts included minimal impact on users and other stakeholders, the provision of automatic location information, the ability to directly connect users to PSAPs, and a high level of reliability to ensure consistent emergency communications. During the course of the review a number of additional candidate solutions were offered consideration and ATIS INES included these in the review until there was simply not enough time remaining to perform full evaluations prior to the December 2011 report goal. As described more fully below, ATIS INES developed a matrix which depicted characteristics of the individual candidate solution relative to the list of ideal requirements in order to develop a side by side direct comparison. ATIS INES also held face-to-face meetings with advocates for persons with disabilities (Advocates) to discuss their needs and concerns in order to gauge the viability of candidate solutions. ATIS INES gained

[1] The term "MMES" is defined in Appendix A.1 Definitions

valuable insight through these discussions and their input significantly impacted and improved the findings. ATIS INES appreciates the time and effort they contributed to the efforts.

Hearing Carry Over (HCO) and Voice Carry Over (VCO) were discussed but not considered as requirements for the ATIS INES solution since the objective is a text alternative to Teletype (TTY). Some IP Relay providers do support Captioned Telephone Service which allows voice to be used with text. This is an emerging solution that is currently available with a limited number of relay providers and supported by the FCC's TRS program.

It quickly became apparent that no single candidate solution met all of our criteria. A major component of the review thus became balancing the relative merits of the candidate solutions in terms of availability, reliability, impact on stakeholders (user experience, cost of new handsets, PSAP operational impact, impact on stability of other system elements, etc.). ATIS INES eventually developed a short list of three candidate solution which performed best against our requirements list. Following the final meeting with the Advocates, ATIS INES decided to keep two of these as part of our recommendations. However, these options require methods for handling the actual text messages outside the call path until NG9-1-1 is in place.

From a technical perspective, IP Relay is the best alternative for interim emergency communications by the June 30th 2012 target timeframe. This result is driven largely by the fact that IP Relay is available nationwide today and widespread use should result in minimal impact to PSAPs – nonetheless ATIS INES recognizes this alternative is not perfect. First, automatic location is not possible with IP Relay so users and communications assistants (CAs) must spend time verifying the registered location or determining the location of the emergency before the 9-1-1 call can be routed to a PSAP. Second, Advocates report that IP Relay is used by only a subset of users for routine communications, due in part to the cost of smartphones that primarily support the required functionality. Greater user adoption of IP Relay for daily communications would improve familiarity with this approach, making its use in emergency situations more natural and potentially saving time. Third, some users reported that the level of IP Relay CA performance in handling emergencies is lower than their performance handling daily communications. A review of CA training and qualifications could address this concern. Fourth, emergency call processing is inherently slower through a relay third party than methods that deliver the initial emergency call from the caller directly to the 9-1-1 system and the PSAP, typically requiring minutes rather than seconds.

Although there was not unanimous agreement, Advocates generally stated a preference during our meetings for SMS to a national relay center dedicated to handling emergency calls. The Advocates reported that SMS is widely used for daily communications and is available on a wide array of handsets, making it a natural choice for emergency communications. The Advocates also supported SMS because it is commonly used across the entire population and it would enable all callers a text option for 9-1-1 calls. This option also has significant shortfalls, however, because SMS was not designed for emergency communications and thus has a wide variety of documented problems if used as an emergency communication tool. First, the latency issues associated with its store and forward architecture provide no assurance that emergency messages will be delivered in order, in a timely manner or even at all. This may have life threatening implications to the end users. Second, it is not designed to provide automatic location information. The time required to develop solutions to overcome this shortfall clearly makes it unsuitable for deployment by June 30th 2012. Third, SMS is not is compatible with the long-term 3GPP standards-based MMES solution and can not be transitioned to the long-term solution. Fourth, this approach would require funding, deploying, staffing and maintaining a national SMS to 9-1-1 clearinghouse to make it effective. This would require significant support from the FCC, which oversees and largely funds the relay function nationally. Additionally, the size and scope of a national clearinghouse would grow exponentially, and probably require Congressional action, if SMS to 9-1-1 was expected to support calls from the entire texting public.

As Congress intended under the Communications and Video Accessibility Act (CVAA), the TTY mandate should be phased out for wireless equipment supporting alternate forms of text-based communications to 9-1-1. Therefore, it is recommended that the Commission permit devices that support the interim solution to be waived of the TTY requirements in order to devote resources to the development of NG9-1-1 technologies.

As part of the evaluation criteria, the ATIS INES considered whether the FCC's existing rules and policies for 9-1-1 emergency communications could be satisfied through the evaluated solutions. The ATIS INES attempted to recommend solutions that most closely align with these rules and policies while recognizing that none of the existing solutions meet all of the FCC's rules and policies for 9-1-1 emergency communications. In order to implement the recommended ATIS INES solutions, the FCC must determine whether the benefits of an interim text-based communications to 9-1-1 solution for persons with disabilities outweighs the cost of waiving the application of many of the FCC's existing rules and policies for 9-1-1 emergency communications.

The FCC should recognize that any existing solution will not be able to meet the broad set of public expectations that are associated with voice calls to 9-1-1. The ATIS INES recommended 3rd Party IP Relay solution, however, will provide a mode of emergency communications that exists today but may be underutilized by persons with disabilities. Alternatively, if the FCC decides to support a National SMS Relay Center rather than IP Relay, then a number of issues will require FCC action to create this new service, including significant funding and organizational issues if it is made available to the entire population. If the FCC adopts any of the ATIS INES evaluated solutions, the FCC should take the regulatory steps necessary to provide the certainty needed to ensure the efficient and expedited deployment and adoption of a text-based emergency 9-1-1 communication solution for persons with disabilities.

The ATIS INES recognizes that the 3GPP MMES standards on the originating network side and the NENA I3 standards on the Public Safety side will provide the long term solution for non-voice emergency services that the disabled community wants and needs. No interim solution should delay or impede the deployment of the long term solution. TTY functionality will be replaced in next generation networks with IP-based text communications and thus does not warrant extensive changes to support an interim emergency services solution.

1 Introduction

1.1 Mission

The mission of the ATIS INES Incubator shall be to:

- Identify possible interim non-voice emergency communication solutions. Identify gaps for an end-to-end interim non-voice emergency communication solution, including impacts to subscribers and upgrades to PSAPs.
- Identify the most promising solution(s) for interim implementation on deployed wireless networks today.
- Leverage existing work in ATIS committees addressing interworking with the National Emergency Number Association (NENA) i3 network.
- Ensure that the interim non-voice emergency communication solution is compatible with the long-term 3GPP standards-based MMES solution.
- Create an interoperability test specification for the interim solution.
- Perform interoperability tests - once devices, applications, and infrastructure (including PSAP) enhancements are available.
- Coordinate this activity with other relevant industry and government groups (e.g., ATIS, NENA, FCC, PTCRB).
- Ensure the FCC is engaged to coordinate policy and regulatory changes to support the interim non-voice emergency communications.

1.2 Scope

The FCC mandated in June 2002 that all digital cell phones have the capability to support TTY/ Telecommunications Device for the Deaf (TDD), through a 2.5 mm jack. The purpose of the TTY mandate was to ensure that persons with disabilities could contact Public Safety utilizing digital cell phones and portable TTY/TDDs. This user community soon learned that texting was a much better way to communicate than utilizing the TTY/TDD technology. Unfortunately, the wireless networks do not support texting to 9-1-1 nor can every PSAP in the country receive text messages. This leaves the disabled mobile users without a viable way to contact 9-1-1.

The industry recognized this condition exists and realized the condition is solved with MMES and NG9-1-1; when LTE is fully deployed and all PSAPs are connected through Internet Protocol (IP). Some carriers have already started the migration to LTE – Fourth Generation (4G). Some PSAPs have the capability to support NG9-1-1 today. However, it will take years to complete the migration to LTE and NG9-1-1. Similar migrations have happened in the past, such as moving from analog to digital wireless and TDMA to GSM.

The ATIS INES Incubator was formed to identify a technical solution that would enable persons with disabilities to contact Public Safety in the interim time period before MMES is nationally available. As Public Safety is of critical concern, the ATIS INES selected the target date of June 30th 2012 to have a viable technical solution available.

2 TTY/TDD Wireless Access Mandate Transition

For the device and manufacturing community, removal of the legacy TTY mandate for future mobile handsets will facilitate increased innovation for product and devices. Therefore, it is fundamental to the successful transition to MMES, the ATIS INES believes nothing should impede or slow the migration to MMES for NG9-1-1. As long as TTY is mandated in every handset, it acts as a disincentive to deploying more modern and user friendly IP-based capabilities in new handsets.

2.1 TTY/TDD Issues

There are many problems with TTY/TDD in general. The following list identifies some of these issues: