ATIS-0500033

ATIS Standard on -

Overview and Operational Considerations for an IMS-based Next Generation 9-1-1 (NG9-1-1) Service Architecture based on ATIS-0500032

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Alliance for Telecommunications Industry Solutions

Approved February 21, 2017

Abstract

This document provides an overview and operational consideration for an IMS-based Next Generation 9-1-1 (NG9-1-1) Service Architecture based upon ATIS-0500032, *ATIS Standard for Implementation of an IMS-based NG9-1-1 Service Architecture*. This document includes considerations related to IMS Emergency Service Networks that are considered terminating networks.

Foreword

The Alliance for Telecommunication Industry Solutions (ATIS) serves the public through improved understanding between carriers, customers, and manufacturers.

The Emergency Services Interconnection Forum (ESIF) provides a forum to facilitate the identification and resolution of technical and/or operational issues related to the interconnection of wireline, wireless, cable, satellites, Internet and emergency services networks.

The ESIF Next Generation Emergency Services (NGES) Subcommittee coordinates emergency services needs and issues with and among SDOs and industry forums/committees, within and outside ATIS, and develops emergency services (such as E9-1-1) standards, and other documentation related to advanced (i.e., Next Generation) emergency services architectures, functions, and interfaces for communications networks.

The mandatory requirements are designated by the word *shall* and recommendations by the word *should*. Where both a mandatory requirement and a recommendation are specified for the same criterion, the recommendation represents a goal currently identifiable as having distinct compatibility or performance advantages. The word *may* denotes a optional capability that could augment the standard. The standard is fully functional without the incorporation of this optional capability.

Suggestions for improvement of this document are welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, ESIF, 1200 G Street NW, Suite 500, Washington, DC 20005.

At the time of consensus on this document, the committees responsible for its development, had the following leadership:

S. Sherwood, ESIF Chair (Verizon Wireless)
R. Hixson, ESIF First Vice-Chair (NENA)
R. Marshall, ESIF Second Vice-Chair (Comtech)
C. Militeau, ESIF NGES Co-Chair (West Safety Services)
T. Reese, ESIF NGES Co-Chair (Ericsson)

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Preface

ATIS has developed a Next Generation 9-1-1 (NG9-1-1) network and emergency call processing architecture based on contributions received since 2011 and requirements by a number of wireless carriers to have an IP Multimedia Subsystem (IMS)-compatible NG9-1-1 design[1]. Additionally, the NENA i3 Architecture Working Group[2] deferred the IMS-based Emergency Services IP network (ESInet) development to ATIS. ATIS' goal in developing this standard has been transparent interoperability between the two network designs.

ATIS' intent in this development work was to produce a standard method for IMS-based carriers to offer NG9-1-1 services wholly within their IMS platforms, while maintaining consistency and interoperability with the NENA i3 ESInet/NGCS (Next Generation Core Services) design goals. This kind of standards approach allows IMS-based carriers to take advantage of complete IMS interoperability and features found in their existing IMS ecosystems, while still remaining interoperable with downstream i3 Public Safety Answering Points (PSAPs) that implement NENA i3 standards and interfaces.

It is also ATIS' goal to assure that terminating NG9-1-1 entities, such as i3 PSAPs, and the upstream networks that are built on the ATIS IMS-based NG9-1-1 Service Architecture to be as completely interoperable with their systems and networks as that of a NENA i3 NG9-1-1 standard SIP-based architecture. This goal of transparency – both upstream and downstream between architectures – ensures that an i3 PSAP should find no difference whether the i3 PSAP interconnects to a NENA i3 ESInet with NGCS, or interconnects to an ATIS IMS-based NG9-1-1 Service Architecture. This consistent interoperability principle has guided all of ATIS' development work since the beginning, as documented within the original Issue Statement underlying this work.

The ATIS IMS-based NG9-1-1 Service Architecture provides compatibility for IMS-based carriers acting as an NG9-1-1 System Service Provider (911SSP) to seamlessly interoperate with NENA i3 ESInet architectures.

For entities early in the process of selecting ESInet solutions, the expectation within this ATIS development work was that the ATIS IMS-based NG9-1-1 Service Architecture would offer a choice for carriers that already had an IMS ecosystem, but not be considered a viable architecture choice for 9-1-1 service entities that had no plans for an IMS infrastructure.

Public Safety entities should naturally understand the applicability of an IMS-based NG9-1-1 Service Architecture network approach to processing emergency calls, yet in this case, they can remain confidently focused on NENA i3-based NG9-1-1 architectures (because IMS may be of interest to carriers, not to jurisdictions), which means that Public Safety's progress and momentum to adopt NG9-1-1 will not be impeded by the introduction of this ATIS NG9-1-1 Service Architecture standard.

1 Scope, Purpose, & Application

1.1 Scope

The telecommunication industry is assessing the sunsetting of the Public Switched Telephone Network (PSTN) as the carriers plan to transition their networks to IP core networks, specifically those utilizing IP Multimedia Subsystem (IMS) architectures. This has implications on legacy emergency services that are based upon Time Division Multiplexing (TDM) technologies. As carriers migrate to IMS, there is value in considering how emergency services can be supported in that environment. This ATIS Standard provides an overview and

[1] IMS is a set of standards based on the IETF RFC 3261 [Ref 18] family of standards that also introduces additional requirements, specific for carrier operators not differentiated in the more general SIP RFCs.

[2] The NENA i3 Architecture Working Group developed NENA-STA-010.2 [Ref 27].

operational considerations for ATIS-0500032. That standard applies Common IMS architecture concepts to NG9-1-1 Service Architectures to encompass:

- Definition of an IMS-based NG9-1-1 Service Architecture that includes an IMS-based NG9-1-1 Emergency Services Network architecture, and a set of additional gateway functional elements adopted from the existing NENA i3 architecture to support the delivery of emergency calls to legacy and NG9-1-1/i3 PSAPs.
- NG9-1-1 network deployment scenarios showing an IMS-based Next NG9-1-1 Service Architecture interconnecting with a variety of originating network and PSAP types and associated Stage 2/3 call flows.

1.2 Purpose

The purpose of this standard is to provide an overview of, and discuss operational and deployment topics related to, ATIS-0500032.

1.3 Application

This standard applies to the following entities:

- NG9-1-1 System Service Providers that support IMS-based emergency services network architectures.
- Originating network providers that interconnect to IMS-based emergency services networks.
- PSAPs (legacy or NG9-1-1) that receive calls from IMS-based emergency services networks.

2 Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this ATIS Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this ATIS Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

[Ref 1] ATIS-0500032, *ATIS Standard for Implementation of an IMS-based NG9-1-1 Service Architecture*.[3]

[Ref 2] ATIS-0500023, *Applying Common IMS to NG9-1-1 Networks*.[3]

[Ref 3] NENA-STA-010.2, *Detailed Functional and Interface Standards for the NENA i3 Solution*, September 10, 2016.[4]

[Ref 4] J-STD-036-C, *Enhanced Wireless 9-1-1 Phase II*, June 2011 including the addendum in J-STD-036-C-1, *Addendum to J-STD-036-C Enhanced Wireless 9-1-1 Phase II*.[3]

[Ref 5] 3GPP TS 29.333, *Technical Specification Group Core Network and Terminals; Multimedia Resource Function Controller (MRFC) - Multimedia Resource Function Processor (MRFP) Mp interface: Procedures Descriptions.*[5]

[Ref 6] NENA 04-001, *Recommended Generic Standards for E9-1-1 PSAP Equipment*.[4]

[Ref 7] NENA 04-005, *NENA ALI Query Service Standard*.[4]

[Ref 8] RFC 5222, *LoST: A Location-to-Service Translation Protocol.*[6]

[Ref 9] RFC 6753, *A Location Dereference Protocol Using HTTP-Enabled Location Delivery (HELD).*[6]

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[3] This document is available from the Alliance for Telecommunications Industry Solutions (ATIS), 1200 G Street N.W., Suite 500, Washington, DC 20005 at: < https://www.atis.org/docstore/default.aspx >.

[4] This document is available from the National Emergency Number Association (NENA) at: < http://www.nena.org/standards/informational >.

[5] This document is available from the Third Generation Partnership Project (3GPP): < http://www.3gpp.org/specs/specs.htm >.

[6] RFC text is available at < http://www.freesoft.org/CIE/RFC/index.htm >.