ATIS-0500032.v002

ATIS Standard on -

ATIS STANDARD FOR IMPLEMENTATION OF AN IMS-BASED NG9-1-1 SERVICE ARCHITECTURE

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ATIS Standard on

ATIS Standard for Implementation of an IMS-based NG9-1-1 Service Architecture

Alliance for Telecommunications Industry Solutions

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Abstract

This Standard defines the Stage 2 (architecture) and Stage 3 (protocol) specifications for an IMS-based NG9-1-1 Service Architecture. This Standard includes the architecture, functional elements, call flows, protocols, and interfaces which were derived from the Stage 1 requirements in ATIS-0500023, “Applying Common IMS to NG9-1-1 Networks”.

Foreword

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

The ESIF IP Multimedia Subsystem for 9-1-1 (IMS911) subgroup led this joint work effort that addresses the application of common IMS (Stage 1, 2, and 3) for the processing, transport, and/or delivery of Emergency Service calls within the NG9-1-1 network to the appropriate Public Safety Answering Point (PSAP). This is a joint effort with the Emergency Services Interconnection Forum Next Generation Emergency Service (ESIF NGES) Subcommittee, Packet Technologies and Systems Committee (PTSC) and the Wireless Technologies and Systems Committee Systems and Network Subcommittee (WTSC SN).

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 within 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 Packet Technologies and Systems Committees (PTSC) develops and recommends standards and technical reports related to services, architectures, and signaling, in addition to related subjects under consideration in other North American and international standards bodies. PTSC coordinates and develops standards and technical reports relevant to telecommunications networks in the U.S., reviews and prepares contributions on such matters for submission to U.S. ITU-T and U.S. ITU-R Study Groups or other standards organizations, and reviews for acceptability or per contra the positions of other countries in related standards developments and takes or recommends appropriate actions.

The Wireless Technologies and Systems Committee (WTSC) develops and recommends standards and technical reports related to wireless and/or mobile services and systems, including service descriptions and wireless technologies. WTSC develops and recommends positions on related subjects under consideration in other North American, regional, and international standards bodies.

The WTSC Systems and Networks Subcommittee (WTSC SN) develops, maintains, amends and enhances American National Standards and ATIS deliverables related to system aspects, networks, and terminals within the GSM family (GSM/EGPRS/UMTS) such as circuit-switched, packet-switched and IP Multimedia services including future developments.

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:

D. Morkunas, ESIF Chair (Intrado)

J. Torres, ESIF First Vice-Chair (Verizon Wireless)

B. Abley, ESIF Second Vice-Chair (NENA)

T. Reese, ESIF IMS911 Co-Chair, ESIF NGES Co-Chair (Ericsson)

M. Dolly, PTSC Chair (AT&T)

V. Shaikh, PTSC Vice-Chair (Peraton Labs)

M. Younge, WTSC Chair (T-Mobile)

D. Zelmer, WTSC Vice-Chair (AT&T)

T. Brooks, WTSC SN Chair (T-Mobile)

M. Mahrove, WTSC SN Vice-Chair (AT&T)

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Preface

ATIS has developed a Next Generation 9-1-1 network and emergency call processing architecture based on contributions received since 2011 and based on 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 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, find 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, (this is 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] 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-010.3 [Ref 27].

1 Scope, Purpose, & Application

1.1 Scope

This ATIS Standard applies IP Multimedia Subsystem (IMS) architecture concepts to Next Generation 9-1-1 (NG9-1-1) networks to encompass:

- Definition of an IMS-based NG9-1-1 Emergency Services Network architecture and set of additional gateway functional elements that are integrated into this IMS-based NG9-1-1 Service Architecture, adopted from the existing NENA i3 architecture, to support the delivery of emergency calls to legacy and NG9-1-1/i3 Public Safety Answering Points (PSAPs).
- NG9-1-1 network deployment scenarios showing an IMS-based 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

IMS standards for Emergency Services have been under development and enhancement in 3GPP since 3GPP Release 9. However, from a Next Generation Emergency Services (NG9-1-1) network perspective, the IMS architecture only defined Emergency Service call processing for the originating network and has not defined call processing, transport, or delivery of Emergency Service calls by an IMS-based NG9-1-1 Emergency Services Network.

The purpose of this Standard is to define the Stage 2 (architecture) and Stage 3 (protocols) to enable North American deployment of NG9-1-1 emergency services networks that are based upon the 3GPP IMS specifications. This IMS-based NG9-1-1 emergency services network is called IMS-based NG9-1-1 Service Architecture.

This Standard includes the architecture, functional elements, call flows, protocols, and interfaces which were derived from the Stage 1 requirements in ATIS-0500023, “Applying Common IMS to NG9-1-1 Networks” [Ref 26].

1.3 Application

The standard applies to requests for emergency services originating from legacy, IMS-based, and generic Voice over Internet Protocol (VoIP) originating networks by routing those emergency service requests to the appropriate PSAP. This standard applies to routing voice, text, and multimedia requests.

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] 3GPP TS 23.167, *Technical Specification Group Services and System Aspects; IP Multimedia Subsystem (IMS) emergency sessions*.[3]

[Ref 2] 3GPP TS 24.229, *Technical Specification Group Services and System Aspects; IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*.[3]

[Ref 3] 3GPP TS 22.101, *Technical Specification Group Services and System Aspects; Service aspects; Service principles*.[3]

[Ref 4] 3GPP TS 23.002, *Technical Specification Group Services and System Aspects; Network architecture*.[3]

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