



**ATIS-1000067.2015(R2020)**

**IP NGN Enhanced Calling Name (eCNAM)**

**AMERICAN NATIONAL STANDARD FOR TELECOMMUNICATIONS**



As a leading technology and solutions development organization, the Alliance for Telecommunications Industry Solutions (ATIS) brings together the top global ICT companies to advance the industry's most pressing business priorities. ATIS' nearly 200 member companies are currently working to address the All-IP transition, 5G, network functions virtualization, big data analytics, cloud services, device solutions, emergency services, M2M, cyber security, network evolution, quality of service, billing support, operations, and much more. These priorities follow a fast-track development lifecycle — from design and innovation through standards, specifications, requirements, business use cases, software toolkits, open source solutions, and interoperability testing.

ATIS is accredited by the American National Standards Institute (ANSI). The organization is the North American Organizational Partner for the 3rd Generation Partnership Project (3GPP), a founding Partner of the oneM2M global initiative, a member of the International Telecommunication Union (ITU), as well as a member of the Inter-American Telecommunication Commission (CITEL). For more information, visit [www.atis.org](http://www.atis.org).

---

## AMERICAN NATIONAL STANDARD

Approval of an American National Standard requires review by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer.

Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made towards their resolution.

The use of American National Standards is completely voluntary; their existence does not in any respect preclude anyone, whether he has approved the standards or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards.

The American National Standards Institute does not develop standards and will in no circumstances give an interpretation of any American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute. Requests for interpretations should be addressed to the secretariat or sponsor whose name appears on the title page of this standard.

**CAUTION NOTICE:** This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken periodically to reaffirm, revise, or withdraw this standard. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute.

---

## Notice of Disclaimer & Limitation of Liability

The information provided in this document is directed solely to professionals who have the appropriate degree of experience to understand and interpret its contents in accordance with generally accepted engineering or other professional standards and applicable regulations. No recommendation as to products or vendors is made or should be implied.

NO REPRESENTATION OR WARRANTY IS MADE THAT THE INFORMATION IS TECHNICALLY ACCURATE OR SUFFICIENT OR CONFORMS TO ANY STATUTE, GOVERNMENTAL RULE OR REGULATION, AND FURTHER, NO REPRESENTATION OR WARRANTY IS MADE OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. ATIS SHALL NOT BE LIABLE, BEYOND THE AMOUNT OF ANY SUM RECEIVED IN PAYMENT BY ATIS FOR THIS DOCUMENT, AND IN NO EVENT SHALL ATIS BE LIABLE FOR LOST PROFITS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES. ATIS EXPRESSLY ADVISES THAT ANY AND ALL USE OF OR RELIANCE UPON THE INFORMATION PROVIDED IN THIS DOCUMENT IS AT THE RISK OF THE USER.

NOTE - The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights. By publication of this standard, no position is taken with respect to whether use of an invention covered by patent rights will be required, and if any such use is required no position is taken regarding the validity of this claim or any patent rights in connection therewith. Please refer to [<http://www.atis.org/legal/patentinfo.asp>] to determine if any statement has been filed by a patent holder indicating a willingness to grant a license either without compensation or on reasonable and non-discriminatory terms and conditions to applicants desiring to obtain a license.

---

## ATIS-1000067.2015(R2020), *IP NGN Enhanced Calling Name (eCNAM)*

Is an American National Standard developed by the **PSTN Transition (PSTN)** Subcommittee under the **ATIS Packet Technologies and Systems Committee (PTSC)**.

*Published by*

**Alliance for Telecommunications Industry Solutions  
1200 G Street, NW, Suite 500  
Washington, DC 20005**

Copyright © 2020 by Alliance for Telecommunications Industry Solutions  
All rights reserved.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher. For information contact ATIS at 202.628.6380. ATIS is online at < <http://www.atis.org> >.

**ATIS-1000067.2015(R2020)**

**American National Standard for Telecommunications**

**IP NGN Enhanced Calling Name (eCNAM)**

**Alliance for Telecommunications Industry Solutions**

Approved August 11, 2015

**American National Standards Institute, Inc.**

**Abstract:**

This American National Standard defines a Calling Name Delivery service in the IP-based Next Generation Network (NGN). The enhanced CNAM (eCNAM) service includes a mandatory longer name field and optional additional information about the caller.

## Foreword

---

The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

The Alliance for Telecommunication Industry Solutions (ATIS) serves the public through improved understanding between providers, customers, and manufacturers. The Packet Technologies and Systems Committee (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 development and takes or recommends appropriate actions.

ANSI guidelines specify two categories of requirements: mandatory and recommendation. 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.

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

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

- M. Dolly, PTSC Chair (AT&T)
- V. Shaikh, PTSC Vice-Chair (Applied Communications Sciences)
- M. Dolly PTSC PSTN Chair (AT&T)
- B. Bethea, PTSC PSTN Vice-Chair (Time Warner Cable)
- H. Mowafy, Technical Editor (Ericsson)

The **PSTN Transition [PSTN]** Subcommittee was responsible for the development of this document.

## Table of Contents

---

1	Scope .....	1
2	Normative References.....	1
3	Acronyms.....	2
4	Service Description .....	3
4.1	Overview .....	3
4.1.1	Key Entities, Roles & Functions.....	3
4.2	Call Flow & SIP Messages.....	4
4.3	LI Architectural Considerations .....	4
4.4	User Perspective.....	4
4.4.1	Anonymity .....	5
4.4.2	User Equipment Contact Lists .....	5
4.4.3	Migration from Conventional Name Service to Enhanced Name Service .....	5
4.4.4	Wireless User Equipment .....	6
4.5	Sources of Extended Name & Related Elements .....	6
4.6	Extended Name Delivery .....	7
4.7	CNAM Plus (Additional Caller Information).....	8
5	Enhanced CNAM Message Description .....	8
5.1	Extended Name Format .....	8
5.2	CNAM Plus Format .....	9
6	Database Access .....	10
6.1	LDAP Transaction .....	11
6.1.1	LDAP eCNAM Search Request.....	11
6.1.2	LDAP eCNAM Search Result .....	11
6.2	XML/SOAP Transaction .....	12
6.2.1	XML eCNAM Request.....	12
6.2.2	XML eCNAM Response.....	12
7	Validity of the Calling Name Information .....	13
8	Informative References .....	13
8.1	ATIS References.....	13
8.2	FCC References .....	13
8.3	Generic Requirements References.....	13
	Annex A: Potential eCNAM Implementation in an SS7 Network.....	14

## Table of Figures

---

Figure 4.1 - eCNAM Call Flow: Service Trigger Point acting as a Proxy .....	4
---	---

## Table of Tables

---

Table 4.1 – Summary of eCNAM Display.....	8
Table A.1 – Summary of eCNAM Display Rules for PSTN Customers.....	14

American National Standard for Telecommunications on –

# IP NGN Enhanced Calling Name (eCNAM)

## 1 Scope

This enhanced Calling Name (eCNAM) standard describes the delivery of a calling name longer than 15 characters along with additional identifiers of the caller to eCNAM subscribers<sup>1</sup> in the NGN. This Standard focuses on service offerings where: (a) both calling and called parties are in the IP-based NGN network, and (b) the Name and related information are obtained from a database. This North American standard delivers names in the extended ASCII set<sup>2</sup> supporting English and French characters. Delivery of eCNAM in other languages is for future consideration.

This document treats multiple aspects of the eCNAM service, including end user perspective, database content, and the database access methods. However, issues related to the integrity of the caller's number are outside the scope of this standard. Telecom service providers (SPs) are investigating verification solutions to increase the reliability and authenticity of the delivered calling numbers which would help reduce the number of erroneous names being delivered.

## 2 Normative References

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

[RFC-2397] IETF RFC 2397, *The "data" URL Scheme*<sup>3</sup>

[RFC-3261] IETF RFC 3261, *The Session Initiation Protocol (SIP)*<sup>3</sup>

[RFC-3323] IETF RFC 3323, *A Privacy Mechanism for SIP*<sup>3</sup>

[RFC-4511] IETF RFC 4511, *Lightweight Directory Access Protocol (LDAP): The Protocol*<sup>3</sup>

Simple Object Access Protocol (SOAP) Recommendations.<sup>4</sup>

---

<sup>1</sup> Further studies are necessary to assess the ability of wireless handsets to display the eCNAM data described in this standard.

<sup>2</sup> Extended ASCII supports 256 characters (8-bit code) in order to provide language specific characters used to write Western European languages: Danish, Dutch, English, French, German, Icelandic, Italian, Norwegian, Portuguese, Spanish, and Swedish.

<sup>3</sup> This document is available from the Internet Engineering Task Force (IETF). < <http://www.ietf.org> >

<sup>4</sup> < <http://www.w3.org/TR/soap> > contains links to the SOAP/1.1 Note and the SOAP Version 1.2 Recommendation documents.

### 3 Acronyms

ASCII	American Standard Code for Information Interchange
AO	Account Owner (service provider identification)
APRI	Address Presentation Restricted Indicator
CNAM	Calling Name
CND	Calling Number Delivery
CPN	Calling Party Number
eCNAM	Enhanced Calling Name
EN	Extended Name (field in the database)
ENPI	Extended Name Privacy Indicator (field in the database)
FCC	Federal Communications Commission
IMS	IP Multimedia Subsystem
IP	Internet Protocol
ISUP	ISDN User Part
LDAP	Lightweight Directory Access Protocol
LI	Lawful Intercept
LIDB	Line Information Database
NGN	Next Generation Network
PII	Personally Identifiable Information
PAI	P-Asserted Identity (SIP)
PSAP	Public Safety Answering Point
QO	Query Originator
SDO	Standards Development Organization
SIP	Session Initiation Protocol
SOAP	Simple Object Access Protocol
SP	Service Provider
TCAP	Transaction Capabilities Application Part (SS7)
TDM	Time Division Multiplexing
TN	Telephone Number
UE	User Equipment
UTF8	Universal Character Set + Transformation Format – 8-bit
URL	Uniform Resource Locator
VoIP	Voice over IP
XML	Extensible Markup Language

## 4 Service Description

### 4.1 Overview

Historically, the 15-character restriction on the Calling Name Delivery in the PSTN was imposed by several factors, including screen technology, cost, and SS7 signaling message length limitations. As the subscription to IP-based voice services increases, and with more economical and improved screen technology, the restriction is no longer necessary. Therefore, eCNAM service can offer an Extended Name, longer than 15 characters, as well as deliver additional identifiers of the caller, such as the address, type of call (e.g., a business), location, or a combination thereof. In this standard, the additional caller information portion of the enhanced CNAM is referred to as CNAM Plus.

The eCNAM service offerings will vary from one service provider to another. While the Extended Name will be the cornerstone of eCNAM service, the number of additional data elements and the choice of those elements will vary based on the service provider. Each service provider will select the data elements to be delivered to its eCNAM customers based on business decisions, regulatory requirements, privacy laws, and the service provider's policies on securing PII (personally identifiable information).

In providing these additional data elements to the called party, the terminating service provider is only able to attest to the credibility of the database owner. The terminating service provider is not expected to perform any analysis or validation of the data elements to ensure any of the data elements belong to the given caller (e.g., an email or type of line). The service provider provisioning the data about the caller in the database is responsible for attesting to the validity of the data.

#### 4.1.1 Key Entities, Roles & Functions

Authoritative Database	<p>A database that contains reliable subscriber information given that it:</p> <ul style="list-style-type: none"> <li>a) Obtains information directly from the subscriber's communications service records (VoIP, wireless, etc), and</li> <li>b) Is updated in near real time with any changes in the subscriber's service profile.</li> </ul>
Conventional CNAM	<p>A service in the PSTN whereby SS7 ISUP and TCAP signaling enabled the retrieval and delivery of the Calling Number and its associated Calling Name to a Customer Premise Equipment (CPE) on calls terminating to the subscriber. The name was limited to 15 characters and no additional information was delivered about the caller. This service is described in GR-1188-CORE.</p>
Hub	<p>A Hub may or may not reside in the service provider's network. Hubs provide multiple services including, but not limited to:</p> <ul style="list-style-type: none"> <li>a) Least cost routing,</li> <li>b) ENUM-like mapping,</li> <li>c) Protocol conversion, and</li> <li>d) Routing of IP and TDM traffic (if necessary).</li> </ul>
Service Provider (SP)	<p>Entity responsible for end user communications service, including the delivery of the eCNAM service to its subscribers.</p>
Query Originator (QO)	<p>Entity requesting and/or retrieving the Name information from the appropriate database. The QO:</p> <ul style="list-style-type: none"> <li>• Requests and/or retrieves the Name information from the appropriate database, and</li> <li>• Delivers the Name information to the SP, or</li> <li>• Delivers the Name information to the subscriber directly (in an INVITE or other message) – if it is the SP for that subscriber.</li> </ul> <p>The QO may retrieve the data on behalf of the SP (e.g., playing the role of a hub) or it may be in the role of an SP.</p>
eCNAM Service Trigger Point	<p>An entity or a function that is programmed to detect certain event(s) upon which it launches a query to retrieve the name and other related information then formulates and transmits the data to the end user. The Trigger Point can reside in a gateway, an NGN Application Server, or another location within its home IP network.</p>

	It is also referred to in this document as Service Trigger Point or Trigger Point.
Enhanced CNAM (eCNAM)	A Calling Name Delivery service in the IMS-based Next Generation Network (NGN). eCNAM = Extended Name (>15 characters) + CNAM Plus (additional caller identifiers)

### 4.2 Call Flow & SIP Messages

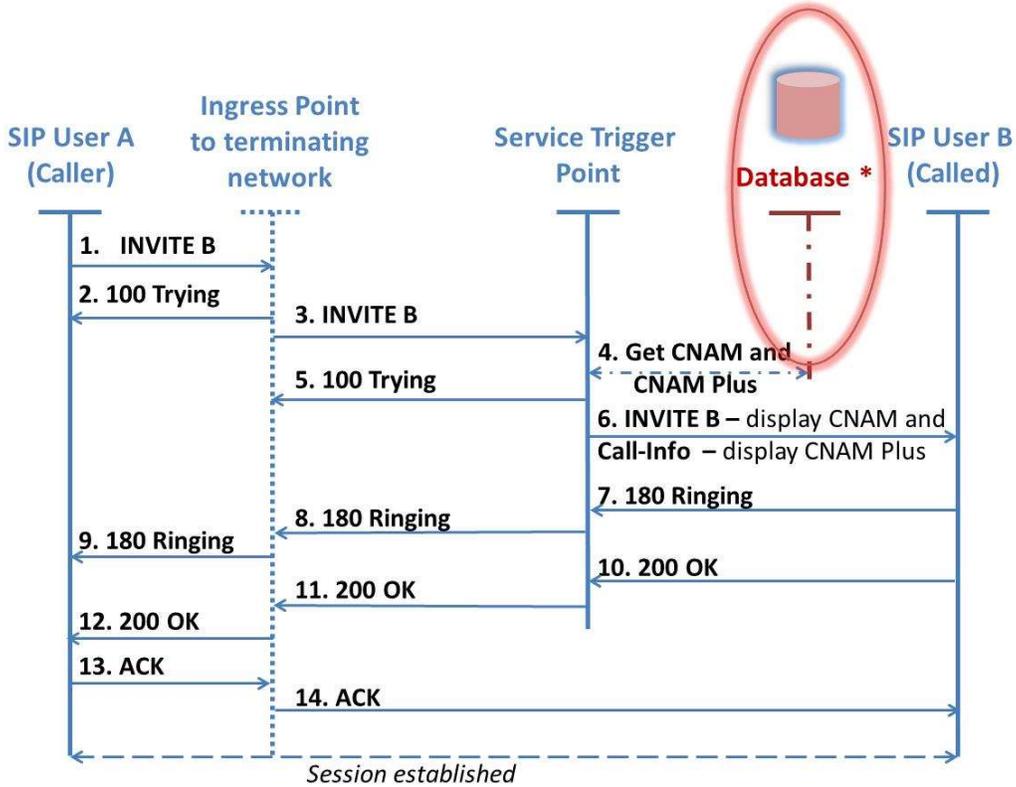


Figure 4.1 – eCNAM Call Flow: Service Trigger Point acting as a Proxy

\* The Service Trigger Point may access the database directly or via a hub. The depiction of the database in Figure 4.1 is purely functional, since the database will not always reside in the terminating network.

The above call flow is provided for illustration purposes only. Other flows are possible, depending on the specific implementation of the Service Trigger Point. In this figure, the Service Trigger Point is acting as a SIP proxy that does not insert its address into the Record-Route header field.

### 4.3 LI Architectural Considerations

In order to meet Lawful Intercept (LI) obligations, service providers may need to make certain modifications to the eCNAM functional elements described in this document. The LI requirements pertaining to eCNAM will be addressed in future issues of [ATIS-1000678].

### 4.4 User Perspective

Information displayed to any SIP called user could be from one or more of the following sources:

1. The caller/sender could be the source and creator of the content inserted in the SIP INVITE;

2. The originating service provider could insert certain data elements about the caller from its network in each outgoing SIP INVITE;
3. The service provider of the called customer could obtain the caller's information from authoritative databases based on the received calling number; or
4. The called user's device could display information on some callers (if the calling number matches an entry in the device's contact list which is created and managed solely by the user).

The eCNAM service described in this standard will deliver information that is retrieved by the terminating service provider from authoritative databases to increase the reliability of the eCNAM service for its subscribers (item 3 above). However, while the terminating service provider is responsible for the eCNAM portion of the data delivered, the end user may receive additional information in separate SIP headers from some of the other sources listed above.

The eCNAM subscriber expects the data provided by the terminating service provider (Extended Name + CNAM Plus) to take precedence over most of the other incoming SIP headers with the exception of emergency services headers. Further work outside the scope of this standard may be necessary to implement such prioritization.

#### 4.4.1 Anonymity

The FCC's initial ruling on [91-281], released in March 1994, emphasized the importance of Calling Party Number (CPN) availability for the range of CLASS<sup>SM5</sup> services, including Calling Number Delivery (CND). Because CPN was necessary for other new services, the 1994 order required all capable carriers to transport CPN without any additional consideration or compensation. For callers who wished to preserve their anonymity, the order further mandated what came to be known as "per-call blocking" by use of the dialing code \*67 as the only method for implementing presentation restriction. Subsequent orders mandated that the \*82 dialing code must be provided so that CPN can be "unblocked" on a call-by-call basis. Carriers are required to forward the blocking/unblocking information without modification, and terminating carriers must abide by the instructions of the caller regarding availability of number and name. In the 1995 order, the FCC ruled that name should be treated the same as number. That is, if the number is blocked, the name SHOULD also be blocked. If number is permitted, name SHOULD also be permitted.

eCNAM delivery in the NGN is expected to adhere to the same presentation and privacy requirements.

#### 4.4.2 User Equipment Contact Lists

The information delivered to the end user under the CNAM service described in this document is offered by the service provider and is not to be mistaken for contact lists or device-based caller information repositories. The sources that the service provider uses to retrieve the name information are discussed in Clause 4.5.

#### 4.4.3 Migration from Conventional Name Service to Enhanced Name Service

The timeline for offering eCNAM will vary among service providers. It is assumed that service providers will migrate their traditional CNAM subscribers to eCNAM, but there is no requirement to do so. During the transition phase, each service provider is expected to manage a mix of customers: those who subscribe to eCNAM and others who continue to subscribe to conventional CNAM. As a result, the terminating service provider is expected to support launching the pertinent IP queries to retrieve the necessary data for each of these Name services.

As for the authoritative databases, the Extended Name will be stored in an additional field that co-exists with the Generic Name field (15 characters) in each customer record. Authoritative database providers are expected to maintain both fields throughout the transition.

<REQ-0000010-Section 4> The Generic Name and the Extended Name fields SHALL each be independently retrievable from the authoritative databases via IP queries.

---

<sup>5</sup> CLASS<sup>SM</sup> are services that depend on the transport of CPN information to provide the end users with additional functionalities.

During the migration to eCNAM, availability of the Extended Name is expected to occur gradually. Therefore, it would be useful to provide the traditional 15-character Generic Name as a default in the absence of the Extended Name – instead of delivering no name

<REQ-0000020-Section 4> In the absence of an Extended Name, and given no anonymity restrictions, the database SHALL be capable of returning the Generic Name in response to eCNAM IP queries instead of a null Extended Name. In that scenario, the Service Trigger Point SHALL deliver the Generic Name in the name-display field of the INVITE.

#### 4.4.4 Wireless User Equipment

As a new generation of services, such as eCNAM, is implemented in the NGN, new requirements and guidelines for the User Equipment should be defined. Part of the service quality perceived by the end user is the UE presentation.

Therefore, requirements on the physical input media and the output, such as indicators and displayed information, must be defined in the relevant Standards Development Organizations. The work should include specifications of the appropriate encoding, string sizes, and the preferred ordering of incoming headers.

### 4.5 Sources of Extended Name & Related Elements

The Extended Name and the CNAM Plus information will be stored in the service provider “authoritative databases”. The information structure of the database is typically indexed by the individual E.164 telephone numbers (TN). Therefore, any authorized entity retrieving the Extended Name and related data elements has to include the specific TN in its query to the database. That TN is obtained from the PAI header or the From header, with precedence given to the PAI.

<REQ-0000030-Section 4> For each individual record, the authoritative database shall support an Extended Name (EN) field that can store up to 35 characters encoded in ASCII [32-255].

The name is expected to be stored as a single string of the first and last names. The choice of storing the name as (*first name, last name*) or (*last name, first name*) is typically determined by the database provider. In the future, separation of First and Last names would be desirable.

<REQ-0000040-Section 4> The authoritative database shall support an Extended Name Privacy Indicator (ENPI) field that stores the following values encoded as INTEGERS:

‘0’ = presentation allowed

‘1’ = presentation restricted

<REQ-0000050-Section 4> The eCNAM Service Trigger Point SHALL extract the calling number from the contents of the incoming SIP INVITE, based on operator policy and use it to retrieve the caller’s Extended Name via a database query. For example, the policy could be to retrieve the calling number from the PAI, and if no PAI is present, use the calling number from the ‘From’ header.

<REQ-0000060-Section 4> The eCNAM Service Trigger Point SHALL launch the appropriate query to obtain the Extended Name and applicable CNAM Plus elements as soon as the INVITE is received. The eCNAM Service Trigger Point SHALL delay forwarding the INVITE to the called party for no more than 1 second awaiting the eCNAM data.

<REQ-0000070-Section 4> If the eCNAM Service Trigger Point receives an error or does not receive any eCNAM data within 1 second of the query launch, the eCNAM Service Trigger Point SHALL forward the received INVITE to the called party (without the name information).

The eCNAM Service Trigger Point SHOULD NOT store<sup>6</sup> or reuse the name information retrieved from a database query beyond the point of receiving the data and delivering it to the eCNAM subscriber. Caching and reusing CNAM data has led to integrity issues with the CNAM service in the PSTN. With the ongoing efforts to improve the integrity of the calling identity (number and name), the practice of caching of eCNAM data must be discouraged.

---

<sup>6</sup> The exception to this is law enforcement, and requirements outlined in [ATIS-1000678.v3.2015].

Service providers (SPs) may query the authoritative database directly or – most likely – select a hub that retrieves the data needed for their eCNAM offerings from the various authoritative databases. For security reasons, access to databases such as a Line Information Database (LIDB) is limited to authorized service providers/query originators – SP/QO – (i.e., those that have a contractual agreement with the database owner).

During the contract process with the database owner, the identity of the SP/QO is verified. Identifiers representing each of the authorized SP/QOs are encoded at each database (or its firewall) to control database access. In addition to the latter, more security measures are applied to allow the SP/QO access to only the data elements specified in the contract. An example implementation of specialized Data Screening procedures is described in [GR-3697-CORE] for both SS7 and IP query originators.

During the transition from offering 15-character Generic Names to eCNAM, it may be useful to return the Generic Name if the Extended Name is not available yet. This could be arranged between the hub and the database owner so as to not require multiple queries.

## 4.6 Extended Name Delivery

### Presentation Allowed

<REQ-0000080-Section 4> If the received SIP Privacy header priv-value is missing, the Service Trigger Point SHALL launch an IP-based eCNAM request to retrieve the Extended Name (EN) and Extended Name Privacy Indicator (ENPI) from the appropriate database. The Service Trigger Point SHALL either:

- a- launch the request directly to the database, or
- b- forward the request to the hub to retrieve the EN and ENPI on its behalf.

<REQ-0000090-Section 4> If the received SIP Privacy header priv-value = “none”, the Service Trigger Point SHALL launch an IP-based eCNAM request to retrieve the Extended Name and Extended Name Privacy Indicator from the appropriate database. The Service Trigger Point SHALL either:

- a- launch the request directly to the database, or
- b- forward the request to the hub to retrieve the EN and ENPI on its behalf.

<REQ-0000100-Section 4> If used, the hub SHALL launch and route the eCNAM request to the pre-selected database(s).

<REQ-0000110-Section 4> The database SHALL return the results of the request containing the Extended Name and Extended Name Privacy Indicator to the Service Trigger Point, directly, or via a hub.

### Unavailable

<REQ-0000120-Section 4> A Service Trigger Point SHALL deliver an “Unavailable” indication in the name-display field of the INVITE if any of the following occurs:

1. The SIP P-Asserted Identity header is missing and the From header does not contain the calling number information
2. No name is returned from the database for the specified calling number<sup>7</sup>
3. Timeout/Busy errors are received

### Presentation Restricted

The Extended Name associated with an anonymous number must not be delivered to the end user. Therefore,

<REQ-0000130-Section 4> If the received SIP Privacy header priv-value has any of the following values, the Service Trigger Point SHALL NOT launch an eCNAM request and SHALL deliver “Anonymous” in the name-display field of the INVITE:

- “header”,

---

<sup>7</sup> This could indicate the name is missing in the database. It could also be due to a screening failure; i.e., the QO is not authorized to access the database.

- "user",
- "id".

In summary, the presentation and delivery of the Extended Name must align with the presentation status of the calling number in the Privacy header. The Service Trigger Point SHALL deliver the Extended Name to the subscriber according to the following table:

**Table 4.1 – Summary of eCNAM Display**

SIP Privacy Header	Action	ENPI	Display
Missing	Launch query to database	Allowed	Extended Name
		Restricted	"Anonymous"
		(No data found/ timeout) <sup>8</sup>	"Unavailable"
"none"	Launch query to database	Allowed	Extended Name
		Restricted	Extended Name
		(No data found/ timeout) <sup>9</sup>	"Unavailable"
"header"	Do NOT launch query	N/A	"Anonymous"
"user"			
"id"			

### 4.7 CNAM Plus (Additional Caller Information)

Each service provider may offer a different set of data in the CNAM Plus portion of eCNAM. For example, one provider may deliver a full Address of a business caller, while another delivers only a location that displays the City, State/Province, or ZIP Code/Canadian Postal Code.

Another CNAM Plus example may include the preferred household language of the caller or the identity of the Service Provider of the caller. The determination of the number and type of data elements is subject to privacy and business considerations. The database may apply different filters for the different query originators (i.e., the terminating service providers). Many of the authoritative databases that exist today already apply what is known as "Data Screening" procedures. Additional examples of data elements that may be available for retrieval from some authoritative databases, such as LIDB, are described in the data catalog of [GR-1158-CORE].

## 5 Enhanced CNAM Message Description

The eCNAM information delivered to the subscriber consists of:

- a. The Extended Name [mandatory], and
- b. CNAM Plus [optional additional calling party information].

### 5.1 Extended Name Format

<REQ-0000140-Section 5> The Extended Name SHALL be delivered to the eCNAM subscriber in the display-name portion of the header used to deliver the eCNAM message (e.g., PAI or 'From' header).

<sup>8</sup> This is not a value of ENPI; the table entry simply represents the case when no data was returned.

<sup>9</sup> This is not a value of ENPI; the table entry simply represents the case when no data was returned.

<REQ-0000150-Section 5> The Service Trigger Point SHALL encode the Extended Name string in UTF8 for delivery in the display-name portion thus supporting both the ASCII Standard Character Set (32-127) and the ASCII Extended Character Set (128-255).

*The extended ASCII codes contain more special symbols and Latin characters than the basic ASCII printable characters. The requirement in this standard to use the extended character set serves to support the Language Laws for displaying the French alphabet (with acute, grave, circumflex accents, etc.) in Canada.*

<REQ-0000160-Section 5> If the Extended Name is longer than 35 characters AND the eCNAM Trigger Point or intermediate node(s) can only support a length of 35 characters, the name SHALL NOT be discarded. Instead, it SHALL be truncated at 35 characters and inserted in the INVITE message to the subscriber.

## 5.2 CNAM Plus Format

<REQ-0000170-Section 5> The eCNAM Service Trigger Point SHALL support the retrieval and delivery of additional information (CNAM Plus) about the calling party to the eCNAM subscriber.

<REQ-0000180-Section 5> The eCNAM Service Trigger Point SHALL NOT retrieve or deliver the additional information (CNAM Plus) if the presentation of the calling number is restricted.

It is conceivable that the databases would assign individual privacy flags per data element in the future. However, for the purpose of this standard, the delivery and display of the additional information will align with the presentation restriction of the calling party number.

The terminating service provider is expected to:

- a) either pre-select the additional data elements that will be delivered to all its eCNAM subscribers, or
- b) offer different elements to different subscribers.

The database provider will apply the capability to filter the data elements the terminating service provider is authorized to receive. These data elements will be identified in contractual agreements between the terminating service provider and the database providers that host the information.

<REQ-0000190-Section 5> The Service Trigger Point SHALL deliver the additional calling party information (CNAM Plus) in a SIP Call-Info header.

The SIP Call-Info header is described in [RFC 3261] as

```
Call-Info = "Call-Info" HCOLON info *(COMMA info)
info      = LAQUOT absoluteURI RAQUOT *( SEMI info-param)
info-param = ( "purpose" EQUAL ( "icon" / "info"
              / "card" / token ) ) / generic-param
```

This eCNAM standard focuses on using the “info” parameter to deliver the CNAM Plus (plain text containing one or more data elements, such as address, postal code, or type of caller). However, since the Call-Info header syntax only supports a URI, a different scheme is needed to deliver plain text.

[RFC 2397] describes a “data” URL scheme that allows the inclusion of data items of up to 1KB directly inline.

The URLs are of the form:

data:[<mediatype>][;base64],<data>

<REQ-0000200-Section 5> For the purpose of delivering the CNAM Plus data, the Service Trigger Point SHALL utilize the “data” URL scheme of [RFC 2397] to encode the CNAM Plus information in the Call-Info header “info” parameter. The ‘mediatype’ SHALL be omitted. As a result, the charset will default to text/plain; US-ASCII.

The following is an example of using the data URL to encode an address and a type of line.

**EXAMPLE**

**64 Zoo Lane  
Bronx, NY 10460  
Hospital**

*translates into*



**64+Zoo+Lane%0D%0ABronx%2C+NY+10460%0D%0AHospital**

The number and length of elements a service provider includes in the CNAM Plus portion may vary, therefore several Call-Info headers may be used to deliver the CNAM Plus information in its entirety.

<REQ-0000210-Section 5> The eCNAM Service Trigger Point SHALL populate each of the CNAM Plus data elements in a separate Call-Info header to the terminating end user.

While it is typical for a session to deliver multiple call-info headers to the end user, the priority needs to be given to the information related to the services that the called end user has subscribed to. The terminating service provider is expected to manage the order of delivering and displaying the various Call-Info headers to the called end user.

<REQ-0000220-Section 5> The eCNAM Call-Info headers generated by the terminating service provider SHALL (1) be displayed to the called end user ahead of other non-subscription Call-Info headers, and (2) bear and indicator<sup>10</sup> of the terminating service provider as the sender of the service-related Call-info headers.

It is assumed that a PSAP would not have eCNAM service active (i.e., there would not be any feature interaction between eCNAM and emergency services).

Intermediate nodes may reorder headers and there is no guarantee that one header will receive higher priority than others. However, the Call-Info headers generated to deliver the CNAM Plus information – per this standard – will be created closer to the terminating user. Therefore, the assumption is that the Call-Info header is less likely to undergo re-ordering, which increases. In the absence of User Equipment (UE) guidelines on displaying caller information, a higher order for a given CNAM Plus Call-Info header – compared to other non-emergency headers – increases the probability of its display to the terminating user.

<REQ-0000230-Section 5> The Service Trigger Point SHALL reorder the headers such that the CNAM Call-Info header(s) are transmitted ahead of non-emergency headers for rendering by the User Equipment.

## 6 Database Access

This standard focuses on the delivery of eCNAM between IP users only. As for offering a similar service to PSTN users, Annex A offers a high level view of how that could be realized.

Service providers select an IP-based protocol they wish to use to provision the EN and CNAM Plus data in the database. Query originators select an IP-based protocol for retrieving the EN and CNAM Plus data from the database. Some of the protocols, such as LDAP, are designed specifically for database/directory transactions. However, other IP-based protocols that were not designed for data retrieval (such as SIP or XML) may be used. By performing protocol conversion, the hubs help ensure that any QO can use virtually any protocol to retrieve eCNAM data from the database(s). As protocols are enhanced and new ones are introduced, the role of the hub will be responsible for protocol mediation that will support the eCNAM service.

This standard does not place any restrictions on the protocols used to provision and retrieve the data in the databases. The choice of protocol is determined by the QO (represented by its Service Trigger Points) and the database provider(s), and the hub.

<sup>10</sup> The nature of the indicator will be determined in future standards/guidelines.

In the following subsections, examples of queries and responses – that are currently in use – are given for illustration purposes.

<REQ-0000240-Section 6> The eCNAM Service Trigger Point SHALL be capable of retrieving the necessary data elements via a single query or multiple queries.

## 6.1 LDAP Transaction

LDAP: The Protocol is defined in [RFC 4511]. One potential implementation of the LDAP interface to an authoritative database is defined in [GR-3103-CORE].

The directory schema of the database is typically made available to authorized query originators, only.

Data elements (referred to as “attributes” in LDAP) are retrievable via the LDAP SearchRequest.

### 6.1.1 LDAP eCNAM Search Request

<REQ-0000250-Section 6> If an LDAP interface is utilized, the eCNAM Service Trigger Point SHALL launch an LDAP SearchRequest to retrieve:

- a) The Extended Name from the ‘en’ attribute, and
- b) Additional data elements for CNAM Plus.

<REQ-0000260-Section 6> If an LDAP SearchRequest is launched (i.e., the calling number is not restricted), the eCNAM Service Trigger Point SHALL populate the following criteria in the SearchRequest:

- An E.164 number as the LDAP base distinguished name (LDAPDN) whose data elements are being sought,
- The ‘wholeSubtree’ as the scope of the search,
- A Filter value of ‘equalityMatch’, and
- ‘neverDerefAliases,’.

The authoritative database is only required to support the equality filter in SearchRequests.

LDAP schema and element symbols may vary and will be determined during negotiations between the database provider and the querying service providers. Examples of additional data elements available for retrieval from one such database, LIDB, are:

Attribute	Symbol
Foreign Language Indicator (cited in this standard as “language”)	fli
Zip Code	zip
Service Provider ID	lao
Generic Name	gn

### 6.1.2 LDAP eCNAM Search Result

The results of the eCNAM Search operation are returned in a SearchResultEntry. The SearchResultEntry will contain the appropriate attributes that were specified in the Search Request, subject to access control and database policies.

The SearchResultEntry contains the Distinguished Name (which is the E.164 telephone number being sought) and the returned attribute list.

<REQ-0000270-Section 6> If an LDAP interface is utilized, and the resultCode is success (0), the eCNAM Service Trigger Point SHALL extract the 'en' attribute and populate it in the display-name portion of the header used to deliver the eCNAM message (e.g., PAI or 'From' header) to the terminating user.

Several error messages may be returned, indicating attribute, security, or service problems.

<REQ-0000280-Section 6> If an LDAP interface is utilized (directly from the Service Trigger Point or via a hub) to the database, and the resultCode returned from the database is any value between (1) and (80), the eCNAM Service Trigger Point SHALL insert "unavailable" in the display-name portion of the header used to deliver the eCNAM message (e.g., PAI or 'From' header) to the terminating user.

The database may return a SearchResultReference containing the URI of the data being searched. It is up to the hub and the service provider to launch a second eCNAM LDAP Search to the referenced URI.

## 6.2 XML/SOAP Transaction

<REQ-0000290-Section 6> If an XML-based query is used, the eCNAM Service Trigger Point SHALL support the retrieval of the eCNAM data via the SOAP Get capability.

### 6.2.1 XML eCNAM Request

The key input element for this request is the 10-digit telephone number.

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <GetEcnam xmlns="https://secure.namedatabase.com/">
      <phoneNumber>6025551234</phoneNumber>
    </GetEcnam>
  </soap:Body>
</soap:Envelope>
```

### 6.2.2 XML eCNAM Response

Assuming the eCNAM request is predefined; i.e., the service provider has set the parameters that will be returned along with the required Extended Name, the 'Ecnam' response will contain the same data elements for each incoming request.

```
<?xml version="1.0" encoding="utf-8"?>
<EcnamResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="https://secure.namedatabase.com/">
  <ReferenceId />
  <TotalFound>1</TotalFound>
  <TotalReturned>1</TotalReturned>
  <ErrorCode>0000</ErrorCode>
  <ErrorDescription>Successful</ErrorDescription>
  <Ecnam>
    <Ecnam>
      <ExtendName>Edward weiskopf-Johnson</ExtendName>
      <Location>Phoenix, AZ 85017</Location>
      <LineType>RS</LineType>
    </Ecnam>
  </Ecnam>
</EcnamResponse>
```

## 7 Validity of the Calling Name Information

---

The industry is investigating cryptographic solutions to assure the identity of the users that originate SIP requests. Additional SIP headers may be used to deliver the originator's digital signature that could be used by the terminating service provider to validate the identity of the signer. Such a mechanism could help the terminating user assess the level of trust of the calling number and make a decision about accepting the session.

Accuracy of the data delivered to eCNAM users depends on multiple factors, both technical and business, some of which are listed below.

- A. Delivery of an accurate calling number would help reduce the number of erroneous eCNAM data delivered to the subscriber.
- B. Retrieving the data from authoritative databases that are integrated into the service order processes helps return more accurate and current results, as opposed to retrieving data from databases that mine from third party sources. Data from the latter can be out-of-date by months or years.
- C. Querying disreputable databases that – for a fee – store names not authorized to use the TN may augment fraud and may cause degradation of the quality of eCNAM service.

## 8 Informative References

---

### 8.1 ATIS References

[ATIS-1000018] ATIS-1000018, *Next Generation Network Architecture*.<sup>11</sup>

[ATIS-1000678] ATIS-1000678.v3.2015 – *Lawfully Authorized Electronic Surveillance (LAES) for Voice over Packet Technologies in Wireline Telecommunications Networks*.<sup>12</sup>

### 8.2 FCC References<sup>13</sup>

*Rules and Policies Regarding Calling Number Identification Service – Caller ID*, CC Docket No. 91-281.

### 8.3 Generic Requirements References<sup>14</sup>

[GR-1158-CORE] GR-1158-CORE (2009), *Line Information Database (LIDB)*.

[GR-1188-CORE] GR-1188-CORE (2009), *Calling Name Delivery Generic Requirements*.

[GR-2838-CORE] GR-2838-CORE (2008), *Generic Requirements for GetData*.

[GR-3103-CORE] GR-3103-CORE (2009), *Lightweight Directory Access Protocol (LDAP) Interface Specification for LIDB*.

---

<sup>11</sup> These documents are available from the Alliance for Telecommunications Industry Solutions (ATIS) at < <https://www.atis.org/docstore/product.aspx?id=22964> >

<sup>12</sup> These documents are available from the Alliance for Telecommunications Industry Solutions (ATIS) at < <https://www.atis.org/docstore/product.aspx?id=28232> >

<sup>13</sup> This document is available from the Federal Communications Commission (FCC). < <http://transition.fcc.gov/> >

<sup>14</sup> These documents are available from Ericsson Inc. at < <http://telecom-info.telcordia.com> >.

## Annex A: Potential eCNAM Implementation in an SS7 Network

(informative)

[GR-1188-CORE] describes the special purpose TCAP query designed for retrieving the generic name parameter from name databases. The query is service-specific to CNAM; it does not support other services.

[GR-2838-CORE] describes a more flexible, service-independent query, known as GetData, which allows a QO to request one or more data elements (from the same record) by their title.

The scope of this standard applies only to IP-based offerings of Enhanced CNAM. It is highly unlikely for service providers to offer a version of eCNAM to customers who are limited to SS7 query methods (i.e., are served by end offices only capable of launching TCAP queries). However, in that unlikely scenario:

- The extended name and any additional data elements selected for CNAM Plus will not be retrievable via the traditional TCAP query outlined in [GR-1188-CORE]. Instead, the service provider SHOULD use the GetData TCAP query outlined in [GR-2838-CORE].

This presupposes that the end office will be capable of providing the logic necessary to (a) launch a GetData query on each terminating call to a CNAM subscriber, (b) receive the returned eCNAM data, and (c) deliver it in FSK to a CPE capable of displaying a name longer than 15 characters.

If the Enhanced CNAM service is offered to a PSTN customer, the presentation of the EN SHALL follow the presentation rules outlined in Table A.1. The contents of the EN Presentation Indicator field in the database would be returned in the GetData Response and used along with the ISUP GN Presentation parameter to determine the display status of all the fields, as shown in table A.1.

**Table A.1 – Summary of eCNAM Display Rules for PSTN Customers**

ISUP GN Presentation	EN Presentation Indicator (returned in TCAP GetData Response)	EN Display	CNAM Plus Display
Allowed	Allowed	Extended Name	CNAM Plus
Allowed	Restricted	Extended Name	CNAM Plus
Allowed	No Indication	Extended Name	CNAM Plus
Restricted	Not applicable (no query launched)	Anonymous	Anonymous
Blocking Toggle	Allowed	Anonymous	Anonymous
Blocking Toggle	Restricted	Extended Name	CNAM Plus
Blocking Toggle	No Indication	Unavailable	Unavailable
No Indication (or no ISDNUP GN in IAM)	Allowed	Extended Name	CNAM Plus
No Indication (or no ISDNUP GN in IAM)	Restricted	Anonymous	Anonymous
No Indication (or no ISDNUP GN in IAM)	No Indication	Unavailable	Unavailable