Standard 2. Specification for Advanced Messaging

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Standard 2

CALEA Specification for Advanced Messaging

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Foreword

In this document, the Personal Communications Industry Association (PCIA) Technical Committee defines the specifications for interface compatibility requirements between paging or wireless packet data service providers (PSPs) and law enforcement agencies (LEAs) for Advanced Messaging services.

Advanced messaging services include such services as subscriber defined on-demand roaming, forwarding and redirection, two-way and acknowledged voice paging, and wireless packet data services.

The Communications Assistance for Law Enforcement Act (CALEA)[1] was enacted on October 25, 1994. CALEA requires telecommunications carriers to ensure that their equipment, facilities, or services have the capability to:

(1) "expeditiously ... isolate and enable the government to intercept all communications in the carrier's control to or from the equipment facilities or services of a subscribe[r], concurrently with the communications' transmission, or at any later time acceptable to the government;"

(2) "expeditiously ... isolate and enable the government to access reasonably available call identifying information about the origin and destination of communications;"

(3) "make intercepted communications and call identifying information available to government in a format available to the carrier so they may be transmitted over lines or facilities leased or procured by law enforcement to a location away from the carrier's premises;" and

(4) "meet these requirements with a minimum of interference with the subscriber's services and in such a way that protects the privacy of communications and call identifying information that are not targeted buy [sic] electronic surveillance orders, and that maintains the confidentiality of the government's wiretaps."[2]

Under CALEA, industry associations and standards-setting bodies are authorized to adopt standards for satisfying these assistance capability requirements. Telecommunications carriers, manufacturers, and/or support service providers that comply with these standards have "safe harbor" and are deemed in compliance with CALEA's capability requirements:

> "a telecommunications carrier shall be found to be in compliance with the assistance capability requirements under section 103, and a manufacturer of telecommunications transmission or switching equipment or a provider of telecommunications support services shall be found in compliance with section 106, if the carrier, manufacturer, or support service provider is in compliance with publicly available technical requirements or standards adopted by an industry association or standard-setting organization. ..."[3]

[1] Communications Assistance for Law Enforcement Act, Pub. L. No 103-414 (CALEA).

[2] Telecommunications Carrier Assistance to the Government, H. Rep. No. 103-827, at 22 (October 4, 1994).

[3] CALEA, § 107.

In November 1997, an Interim Standard (J-STD-025) for wireline and wireless telephony was adopted by the Telecommunications Industry Association Subcommittee TR45.2 and Committee T1 of the Alliance for Telecommunications Industry Solutions.[4] Shortly thereafter, in December 1997, a working group was established under the auspices of PCIA to determine whether J-STD-025 was readily applicable to paging or wireless packet data technology and, if not, to develop a separate standard for the paging and wireless packet data industry. After carefully reviewing J-STD-025, the working group determined that J-STD-025's telephony specifications were not readily applicable to paging or wireless packet data technology and that a separate standard was necessary.

In order to expedite the standards-setting process, the Paging Technical Committee decided to develop a Suite of Standards and release this Suite of Standards in three parts. This Standard deals with Advanced Messaging. Any PSP, manufacturer, or service provider that complies with this Standard will have "safe harbor" for Advanced Messaging services under section 107 of CALEA and will be found in compliance with CALEA's assistance capability requirements.

The following Standard for advanced messaging services supplements the standard previously adopted for traditional, one-way paging services[5].

One annex is attached to this standard. This annex is informative only and is not a part of this standard.

[4] Lawfully Authorized Electronic Surveillance, TIA/ATIS, Interim/Trial Use Standard (J-STD-025).

[5] Standard 1, CALEA Specification for Traditional Paging, v1.0

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1. Introduction

In this document, the PCIA Technical Committee defines the specifications for interface compatibility requirements between PSPs and LEAs for Advanced Messaging services.

Advanced messaging services include such services as subscriber defined on-demand roaming, forwarding and redirection, two-way and acknowledged voice paging, and wireless packet data services.

The following Standard for advanced messaging services supplements the standard previously adopted for traditional, one-way paging services.

One annex is attached to this standard. This annex is informative only and is not a part of this standard.

1.1 Purpose

In this document, the PCIA Technical Committee defines the specifications for interface compatibility requirements between PSPs and LEAs for Advanced Messaging services.

Any PSP, manufacturer, or service provider that complies with this Standard will have "safe harbor" for Advanced Messaging services under section 107 of CALEA and will be found in compliance with CALEA's assistance capability requirements.

1.2 Scope

The scope of this Standard is to define the services to support LAES and the interface between a PSP and an LEA for Advanced Messaging services.

1.3 How This Document is Organized

This Standard is organized as follows:

Foreword provides an overview of this document.

Document Change Record provides revision control for this document.

Section 1 **Introduction** defines the purpose, scope, and organization of this document.

Section 2 **Features and Services Overview** defines the means to access Advanced Messaging communications through the means of an independent communications path.

Section 3 **Assumptions** identifies this Standard's assumptions related to call content and reasonably available call-identifying information.

Section 4 **Network Reference Model** identifies the set of functional entities and actions for the intercept process.

Section 5 **Call Content and Reasonably Available Call-Identifying Information Delivery** describes the information provided by the PSP Infrastructure Data Delivery Point for LEA(s).

Section 6	**Call Content and Reasonably Available Call-Identifying Information Surveillance Service Description** describes the service provided by the PSP Infrastructure to deliver call content and reasonably available call-identifying information for a particular intercept subject.
Section 7	**Advanced Messaging Interface (AMI) Protocol** defines the protocol used to deliver call content and reasonably available call-identifying information from the PSP Infrastructure Data Delivery Point for LEA(s) for use by the LEA-Provided CALEA Interface.
References	References defines a list of the references used in the preparation of this Standard.
Glossary	Glossary defines the words, acronyms, and initialisms that are used in this Standard.
Annex 1	**Examples** gives a non-comprehensive list of illustrative uses of this Standard.

2. Features and Services Overview

This Standard defines intercept of wireless communications for subjects equipped with "Advanced Messaging" services. The following describes the operational features and capabilities of the services classified as "Advanced Messaging".

2.1 Advanced Messaging Services

Advanced messaging services, as currently perceived, are:

2.1.1 Subscriber Defined On-Demand Roaming

Subscriber defined on-demand roaming permits the subscriber to change the geographic radio coverage area of the PSP's infrastructure to which the subscriber's outbound messages are to be sent.

2.1.2 Forwarding and Redirection

Forwarding and redirection permits the subscriber to change the destination radio device or specify an external address which is alerted by outbound message calls to the subscriber's given access number, PIN, or capcode.

2.1.3 Two Way and Acknowledged Voice Paging

Two-way and acknowledged voice paging are advanced wireless services that support the transmission of tone-only, numeric, alphanumeric, binary data, and voice message signals between control terminals at fixed location(s) and radio transceiving devices.

There are two basic types of intercept subject-related content and call-identifying information transactions associated with these services:

Outbound Messages

Outbound messages are transmitted to the radio transceiving device from the radio transceiving device's Home Node within the PSP Infrastructure. These messages may originate from external wireline sources, other wireless devices, or the PSP Infrastructure.

Inbound Messages

Inbound messages are transmitted by the radio transceiving device to the radio transceiving device's Home Node within the PSP Infrastructure. These messages may be destined for external wireline addresses, other wireless devices, or the PSP system.

2.1.4 Wireless Packet Data Services

Wireless Packet Data Services are advanced wireless data services that support the transmission of numeric, alphanumeric, and binary packet data message signals between control terminals at fixed location(s) and radio transceiving devices.

There are two basic types of intercept subject-related content and call-identifying information transactions associated with these services:

Outbound Messages

Outbound messages are transmitted to the radio transceiving device from the radio transceiving device's Home Node within the PSP Infrastructure. These messages may originate from external wireline sources, other wireless devices, or the PSP Infrastructure.

Inbound Messages

Inbound messages are transmitted by the radio transceiving device to the radio transceiving device's Home Node within the PSP Infrastructure. These messages may be destined for external wireline addresses, other wireless devices, or the PSP system.

2.2 Advanced Messaging Interface Advantages

The Advanced Messaging Interface techniques included in this Standard for advanced messaging services offer a number of advantages.

Inclusive - The Standard addresses all currently perceived Advanced Messaging services including advanced one-way and both the outbound and inbound portions of two-way paging, acknowledged voice, and wireless packet data,

Universal -Can be implemented using industry-standard computer protocols,

Uniform - A single interface standard supports both large and small LEAs,

Scaleable - Cost-effective for small systems and LEAs and may be field-expanded as needs grow,

Discrete - Invisible to both intercept subjects and callers and controlled visibility to PSP staff,

Connectivity - Flexible data transmission protocol delivers surveillance on tone-only, numeric, alphanumeric, binary data, and voice messages over the most appropriate communications facilities.

3. Assumptions

This Standard for advanced messaging is based upon the following assumptions.

3.1 General

Advanced Messaging LAES capabilities allow a PSP to deliver the intercepted call content and reasonably available call-identifying information, associated with completed paging or wireless packet data calls to subscriber accounts which are equipped for Advanced Messaging services, to an authorized LEA via the most appropriate communications facilities.

3.2 Call Content

Although not specifically defined in CALEA, "content" is defined in 18 USC 2510 (8) to be "when used with respect to any wire or electronic communications, includes any information concerning the substance, purport or meaning of that communication." As interpreted by this Standard for advanced messaging, call content covers tone-only, numeric, alphanumeric, binary data, and voice messages:

Delivered to the PSP RF Network or to the appropriate External Messaging source or Input Node when termination is applicable and the alternate address is an external wireline address from the subscriber's Home Node in the PSP Infrastructure in advanced one-way, two-way, acknowledged voice, and wireless packet data outbound message services, or

Transmitted from a subscriber's radio transceiving device and delivered to the subscriber's Home Node in the PSP Infrastructure in advanced two-way, acknowledged voice, and wireless packet data inbound message services.

Call content information supplied by the PSP to the LEA may be derived from multiple sources (email, multiple phone/pin numbers, etc.). The PSP will, under the terms of a Lawful Authorization, provide all reasonably available information to the LEA.[6] It shall remain the responsibility of the LEA to review and minimize any delivered information which falls outside the bounds of the Lawful Authorization.

3.2.1 Encryption

As interpreted by this Standard for advanced messaging, encryption is defined as the process of changing the format of the information content of a message or message routing information such that external observers will not be able to interpret correctly the content or routing information.

APSP shall not be responsible for decrypting, or ensuring the government's ability to decrypt, any communication encrypted by a subscriber or customer, unless the encryption was provided by the PSP and the PSP possesses the information necessary to decrypt the communication.[7]

[6] 47 U.S.C. § 2518(4) does not mandate that a Lawful Authorization authorizing the interception of a subscriber's facilities identify those facilities in any specific manner (e.g., by the phone number associated with that facility as opposed to the capcode and frequency for the facility). Instead, it simply requires that the order specify "the nature and location of the communications facilities as to which, or the place where, authority to intercept is granted."

[7] CALEA, § 103(b)(3).

3.2.2 Encoding

As interpreted by this Standard for advanced messaging, encoding is defined as the conversion of data or voice signals into a format suitable for transmission by the PSP infrastructure.

If the PSP Infrastructure encodes data or voice, then the encoding algorithm will be made available to the LEA if appropriate. Licensing issues associated with such encoding formats are beyond the scope of this Standard and must be handled between the LEA and the licensor.

3.2.3 Compression

As interpreted by this Standard for advanced messaging, compression is defined as the reduction in the number of bits required to exchange information between two or more parties.

If the PSP Infrastructure compresses data or voice, then the compression algorithm will be made available to the LEA, if appropriate. Licensing issues associated with such compression methods are beyond the scope of this Standard and must be handled between the LEA and the licensor.

Compression can take on multiple forms as illustrated by the following examples.

Codes - where a code of 01 may represent a character string comprised of one or more words,

Abbreviations - where common words are abbreviated such as "PLZ" for "Please", and

Compression of binary data - where a lossless or lossy algorithm is used to reduce the redundant information content in a message.

If the PSP Infrastructure compresses a message using codes or abbreviations, then the PSP Infrastructure will decompress the message prior to sending it to the LEA.

If the PSP Infrastructure compresses a message using a lossless or lossy compression algorithm, then the compression algorithm will be made available to the LEA. If a lossy compression algorithm is used on the call content, no translations of content will be provided as part of the Delivery process to the LEA so as to protect the integrity of information content of the message. Licensing issues associated with such algorithms are beyond the scope of this Standard and must be handled between the LEA and the licensor.

3.3 Call Identifying Information

Call identifying information is defined in CALEA Section 102 (2) to be "dialing or signaling information that identifies the origin, direction, destination or termination of each communication generated or received by a subscriber by means of any equipment, facility or service of a [PSP]".

3.3.1 Outbound Message Services

As interpreted for advanced one-way, two-way, acknowledged voice, and wireless packet data outbound message services by this Standard for advanced messaging, outbound message services call-identifying information is defined as follows:

Destination is the radio receiving or transceiving device address to which a call is being made (e.g., called party);

Direction is the outbound transmission path from the PSP Home Node to the RF network or to the appropriate External Messaging source or Input Node when termination is applicable and the alternate address is an external wireline address;

Origin is the number or address of the party initiating the call (e.g., calling party); and

Termination is the alternate address to which a call is being routed, if applicable (e.g., forwarded party).

For these outbound message services, reasonably available call-identifying information is that information used in the Home Node for call processing. Reasonably available call-identifying information generally consists of the address of the subject's radio receiving or transceiving device(s) and, if appropriate, the address to which the message has been forwarded or redirected. The call origin is not reasonably available in most PSP installations but may be obtained through the originating service provider (e.g., EC, ISP).

3.3.2 Inbound Message Services

As interpreted for advanced two-way, acknowledged voice, and wireless packet data inbound message services by this Standard for advanced messaging, inbound message services call-identifying information is defined as follows:

Destination is the number or address of the device to which the intercept subject sends a message (i.e., called party),

Direction is the transmission path from the intercept subject's radio transceiving device to the intercept subject's PSP Home Node,

Origin is the address of the intercept subject's radio transceiving device sending the message (i.e., the calling party), and

Termination is the same as *Destination*.

For these inbound message services, both *Origin* and *Destination* information are available.

3.4 Call Completion

As interpreted by this Standard for advanced messaging, call completion is defined as follows:

Delivery, from the Home Node, of the tone-only, numeric, alphanumeric, binary data, and/or voice messages to the RF network or to the appropriate External Messaging source or Input Node when termination is applicable and the alternate address is an external wireline address in advanced one-way, two-way, acknowledged voice, and wireless packet data outbound message services,

Arrival, at the Home Node, of the tone-only, numeric, alphanumeric, binary data, and/or voice messages transmitted from a subject's radio transceiving device in advanced two-way, acknowledged voice, and wireless packet data inbound message services. Any transmissions attempted by a subject's radio transceiving device which do not arrive at the Home Node are not considered to be "completed".

3.5 PSP Infrastructure Architectural Model

As interpreted by this Standard for advanced messaging, the PSP Infrastructure architecture is defined to include three distinct network nodes as shown in Figure 1. These nodes are defined as follows:

Input Node encompasses those functions needed to deliver messages to and from wireline carrier sources (e.g., EC, ISP),

Home Node encompasses subscriber database records and those functions needed to route messages between the appropriate Input Node(s) and the RF Network, and

RF Network encompasses those functions needed to deliver messages to and from wireless carrier sources (e.g., radio transceiving devices). The RF Network includes RF transmitters and Output Node encoders and, in two-way advanced messaging systems, RF receivers.

These network nodes may be geographically distributed or concentrated and may exist as either individual physical or virtual entities or some combination thereof.

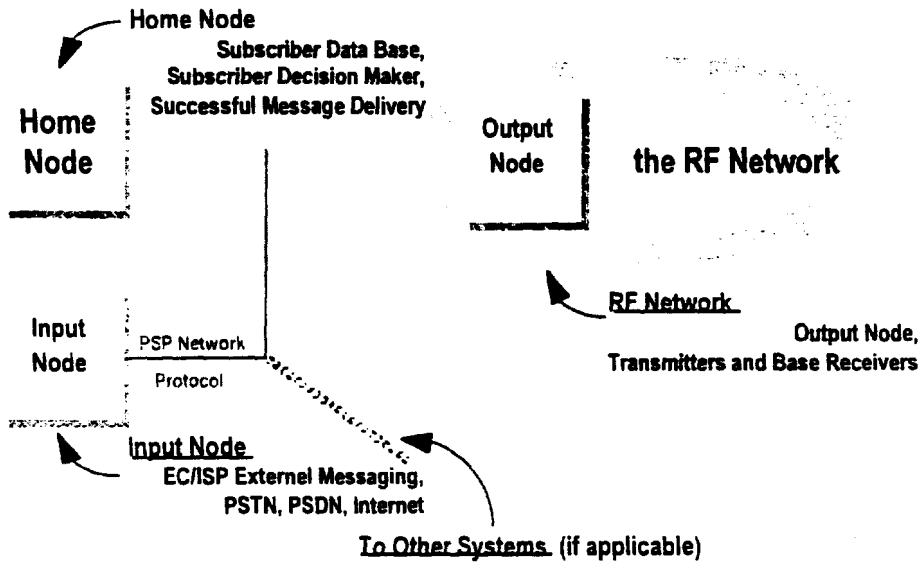

Figure 1: Single System PSP Infrastructure Model

These network nodes may also be grouped to form a PSP Infrastructure consisting of multiple system nodes. One such multiple system PSP Infrastructure is shown in Figure 2.

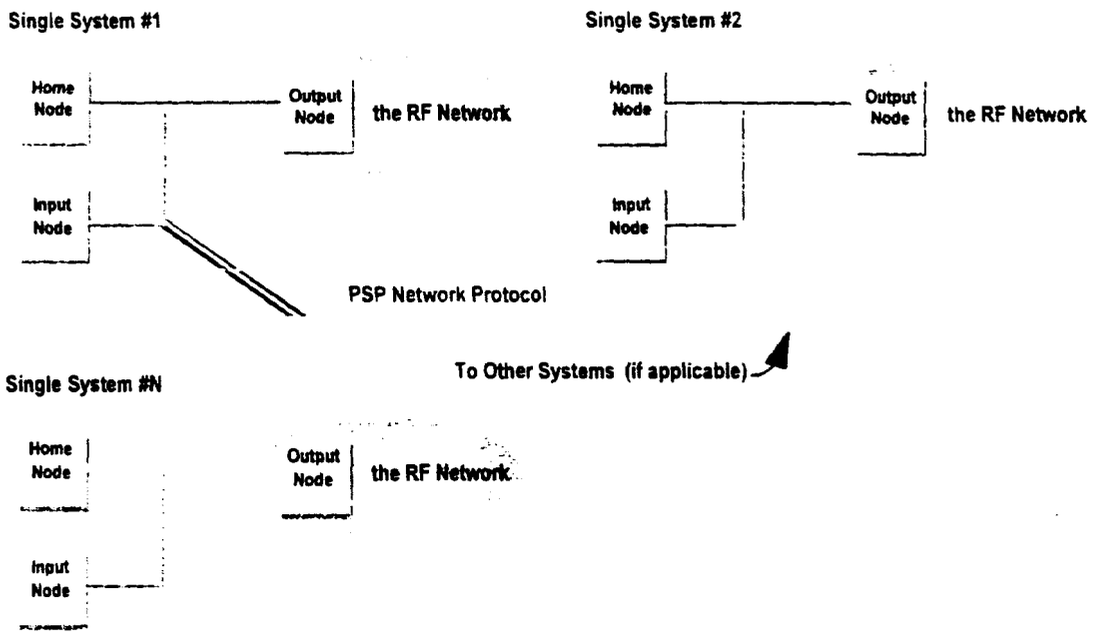

Figure 2: Multi-System PSP Infrastructure Model

The definition of the functions of these network nodes and any or all protocols used between these network nodes is beyond the scope of this Standard.

4. Network Reference Model

The intercept process consists of a set of functional entities and the actions between the functional entities. The functional entities (PSP Administration, LEA Administration, LEA-Provided CALEA Interface, PSP Infrastructure, and External Messaging) provide the functions of the system and actions (Authorization, Provision, and Delivery) provide the communication of information between the functional entities. These actions and functional entities are discussed without regard to their implementation. The relationships between these actions and functional entities are shown in Figure 3.

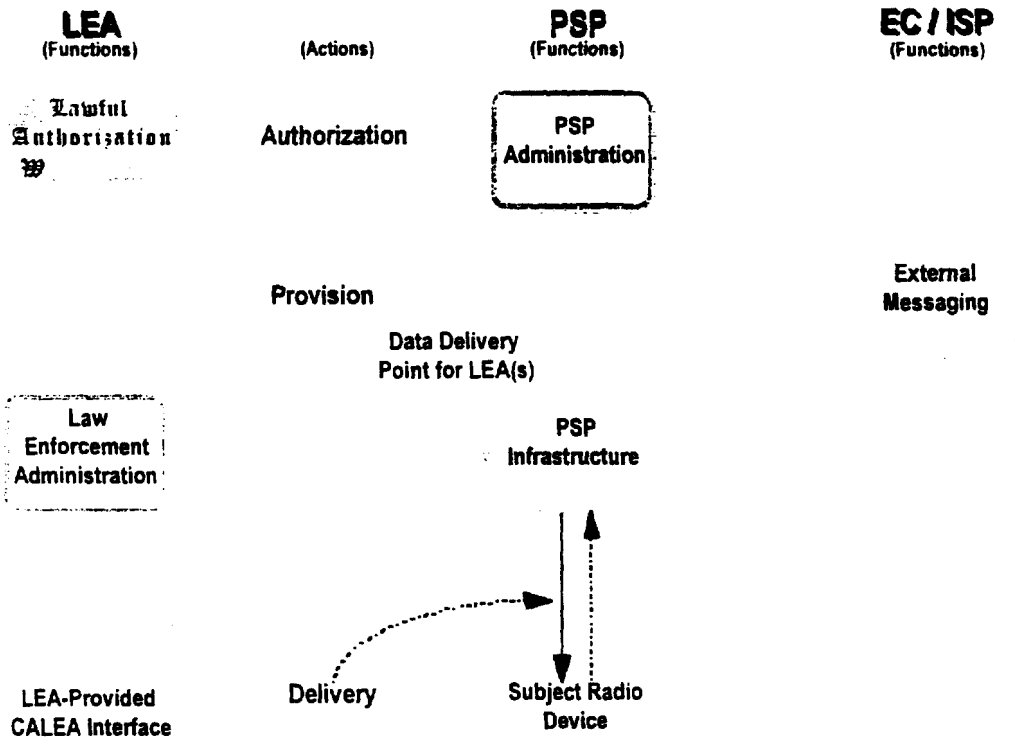

Figure 3: Advanced Messaging Intercept Model

The **Lawful Authorization** is an important part of the LAES. No intercepts shall take place without specific lawful authorization. One Lawful Authorization may encompass multiple devices and/or multiple geographic locations.

4.1 Lawful Authorization Action

The Lawful Authorization Action is the serving of the Lawful Authorization to the PSP by the LEA.

4.2 PSP Administration Function

The PSP Administration Function is responsible for controlling the Provision, enabling the Delivery Actions, and maintaining the Data Delivery Point for LEA(s).

Other functions of the PSP Administrative Function are beyond the scope of this standard.

4.3 Provision Action

The Provision Action is responsible for enabling and disabling activation of the Data Delivery Point for LEA(s). The Provision Action includes the ability:

- to unobtrusively make the call content and reasonably available call-identifying information available to the delivery action and
- to protect (i.e., prevent unauthorized access, manipulation, and disclosure) intercept controls and intercepted call content and reasonably available call-identifying information consistent with PSP security policies and practices.

For advanced messaging, the Provision Action establishes the interface and controls between the LEA and the PSP for the purpose of intercepting messaging traffic as specified by a Lawful Authorization.

4.4 Law Enforcement Administrative Function

The Law Enforcement Administrative Function is responsible for controlling LEA electronic surveillance functions.

The LEA is also responsible for providing the LEA-Provided CALEA Interface and the associated Delivery Function link to the PSP Infrastructure Data Delivery Point for LEA(s) for receiving the messaging traffic of the subject of a lawful authorization and for transporting, capturing, and processing of the delivered call content and reasonably available call-identifying information.

The Law Enforcement Administrative Function is the responsibility of the LEA.

Other functions of the Law Enforcement Administrative Function are beyond the scope of this standard.

4.5 External Messaging Function

The External Messaging Function is the delivery of messages to and from wireline carrier sources (e.g., EC, ISP) to the PSP Infrastructure and is beyond the scope of this Standard.

4.6 PSP Infrastructure Function

The PSP Infrastructure Function is the switching and radio transmission network of the PSP. For this Standard, the PSP Infrastructure is responsible for the collection and delivery of call content and reasonably available call-identifying information of one or more lawfully authorized intercept subject(s). The PSP Infrastructure function includes the ability:

to accept reasonably available call identifying information for each intercept subject for each message received by the home node;

to accept call content for each intercept subject received by the home node;

to gather the information required for providing the reasonably available call-identifying information consisting of the message origin (if reasonably available), message destination, message termination (if appropriate), and date and time of successful message delivery to the RF Network (when the direction is to the Intercept Subject from the PSP Infrastructure) and successful message delivery to the Home Node of the Intercept Subject (when the direction is from the Intercept Subject to the PSP Infrastructure) and call content;

to ensure that the call content and reasonably available call-identifying information delivered from the Data Delivery Point for LEA(s) is authorized for a particular LEA;

to deliver the call content and reasonably available call-identifying information for each intercept subject from the Data Delivery Point for LEA(s) for use by one or more LEA-Provided CALEA Interfaces (up to a total of five per intercept subject);

to ensure that delivery is only available from the Data Delivery Point for LEA(s) for the time limit bounds set by the Lawful Authorization; and

to protect (i.e., prevent unauthorized access, manipulation, and disclosure) intercept controls and intercepted call content and reasonably available call-identifying information consistent with PSP security policies and practices.

4.7 Delivery Action

The Delivery Action is responsible for delivering intercepted communications expeditiously from the PSP Infrastructure Data Delivery Point for LEA(s) for use by one or more LEA-Provided CALEA Interfaces (up to a total of five per intercept subject). Transporting, capturing, and processing of the delivered call content and reasonably available call-identifying information is the responsibility of the Law Enforcement Administrative Function.

The Delivery Action includes the ability:

to deliver call content and reasonably available call-identifying information for each intercept subject from the PSP Infrastructure Data Delivery Point for LEA(s) and

to protect (i.e., prevent unauthorized access to, manipulation of, or disclosure of) intercept controls and intercepted call content and reasonably available call-identifying information consistent with PSP security policies and practices.

For advanced messaging, the Delivery Action delivers call content and reasonably available call-identifying information using the Advanced Messaging Interface (AMI) Protocol from the PSP Infrastructure Data Delivery Point for LEA(s) for use by the LEA-Provided CALEA Interface.

Enabling and disabling the Delivery Function from the PSP Infrastructure Data Delivery Point for LEA(s) as defined in the Lawful Authorization is the responsibility of the PSP.

The methods of delivery transport (e.g., Ethernet, X.25, Dial-Up PPP, Frame Relay) and security measures (e.g., SSL, dedicated transmission paths, ACE Card access on Dial-Up PPP) employed by the LEA are beyond the scope of this Standard.

4.8 Subject Radio Device Function

The Subject Radio Device Function is responsible for collecting and interpreting communications from and, where applicable, encoding and disbursing communications to the Home Node of the intercept subject.

The functions of the Subject Radio Device are beyond the scope of this Standard.

4.9 LEA-Provided CALEA Interface Function

The LEA-Provided CALEA Interface Function is responsible for collecting lawfully authorized intercepted communications (i.e., call content and reasonably available call-identifying information) for the LEA. The LEA-Provided CALEA Interface Function is the responsibility of the LEA.

The LEA-Provided CALEA Interface Function includes the ability to receive and process call content and reasonably available call-identifying information for each intercept subject as delivered using the Advanced Messaging Interface (AMI) protocol.

Enabling and disabling of the activation of the LEA-Provided CALEA Interface is the responsibility of the LEAAdministration Function and is beyond the scope of this Standard.

Procurement and monitoring of the LEA-Provided CALEA Interface is the responsibility of the LEA and is beyond the scope of this Standard.

5. Call Content and Reasonably Available Call-Identifying Information Delivery

This section describes the information provided by the PSP Infrastructure Data Delivery Point for LEA(s) for use by the LEA-Provided CALEA Interface. The PSP is required to provide access to the call content and reasonably available call-identifying information for particular intercept subjects.

In cases where circumstances dictate that the call content and the reasonably available call-identifying information associated with a particular subject need to be delivered to more than one LEA simultaneously, as may occur when different LEAs are conducting independent investigations on the same subject, the delivered call content and reasonably available call-identifying information shall be made available to other LEAs as required. In the event that the LEA is conducting investigations on more than one subject, the delivered call content and reasonably available call-identifying information may be combined within the connection to the LEA. In this case, the information is uniquely identified in such a manner that the LEA is able to determine the intercept subject.

A subject's call content and reasonably available call-identifying information is transported to the LEA over a wireline connection via an HTTP shell with included MIME-encoded enclosures for content and vCard-identified reasonably available origin, destination, and, when applicable, termination information. The two types of events to be monitored within an Advanced Messaging System for an intercept subject are outbound messages and inbound messages. Call-identifying information is provided when reasonably available and is synchronized with the call content within the HTTP POST operation.

5.1 Outbound Message

An outbound message occurs when a message is delivered to the PSP radio transmission network from the subscriber's Home Node and contains the following information:

Call-Identifying Message Number is a PSP-generated message identification number that is provided to allow the LEA to coordinate related outbound and inbound messages when the latter is known to be a response to the former by the PSP;

Origin is the number or address of the party initiating the call (e.g., calling party), if reasonably available;

Destination is the radio receiving or transceiving device address to which a call is being made (e.g., called party);

Direction is the transmission path from the intercept subject's PSP Home Node to the intercept subject's radio device or to the appropriate External Messaging source or Input Node when termination is applicable and the alternate address is an external wireline address and is inferred from the inclusion of the intercept subject's address in *Destination*;

Termination is the alternate address to which a call is being routed, if applicable (e.g., forwarded party);

Date and Time is the date and time of message delivery to the RF Network by the Home Node; and

Call Content is the actual content of the message. This may be an attached MIME-encoded file (e.g., a voice file in the case of voice paging).

5.2 Inbound Message

The Inbound Message occurs when a message is transmitted from a subscriber's radio transceiving device and delivered to the subscriber's Home Node and contains the following information:

Call-Identifying Message Number is a PSP-generated message identification number that is provided to allow the LEA to coordinate related inbound and outbound messages when the latter is known to be a response to the former by the PSP;

Origin is the address of the intercept subject's radio transceiving device sending the message (i.e., the calling party);

Destination is the number or address of the device to which the intercept subject sends a message (i.e., called party);

Direction is the transmission path from the intercept subject's radio transceiving device to the intercept subject's PSP Home Node and is inferred from the inclusion of the intercept subject's address in *Origin*;

Termination is the same as *Destination* and, as such, is not supplied;

Date and Time is the date and time of message delivery to the Home Node by the intercept subject's radio transceiving device; and

Call Content is the actual content of the message. This may be an attached MIME-encoded file (e.g., a voice file in the case of voice paging) or a simple message acknowledgment.

6. Call Content and Reasonably Available Call-Identifying Information Surveillance Service Description

This section describes the service provided by the PSP Infrastructure to deliver call content and reasonably available call-identifying information for a particular intercept subject.

The delivery mechanism specifies that identified call content and reasonably available call-identifying information which shall be expeditiously provided to LEAs (up to a total of five LEAs per intercept subject) in a common format using readily available protocols, wireline transport links, and computing equipment. The description of specific implementations for the PSP Infrastructure Data Delivery Point for LEA(s) is left flexible to handle a multitude of TCP/IP-supporting connectivity solutions. The transporting, capturing, and processing of the delivered call content and reasonably available call-identifying information is the responsibility of the Law Enforcement Administrative Function.

The communications and protocol between the PSP Infrastructure Data Delivery Point for LEA(s) and the LEA-Provided CALEA Interface allow the LEA to receive call content and reasonably available call-identifying information in an expeditious manner, regardless of the location of the intercept subject, and whether or not the subject is within RF coverage of the PSP.

The interface provides access to the messages to and from the intercept subject unobtrusively and transparently. Access to reasonably available call-identifying information and call content does not deny the availability of advanced messaging services to either the intercept subject or the calling party.

A PSP shall not be responsible for decrypting, or ensuring the government's ability to decrypt, any communication encrypted by a subscriber or customer, unless the encryption was provided by the PSP and the PSP possesses the information necessary to decrypt the communication.[8]

If the PSP Infrastructure encodes data or voice, then the encoding algorithm will be made available to the LEA, if appropriate. Licensing issues associated with such encoding formats are beyond the scope of this Standard and must be handled between the LEA and the licensor.

If the PSP Infrastructure compresses data or voice, then the compression algorithm will be made available to the LEA, if appropriate. Licensing issues associated with such compression methods are beyond the scope of this Standard and must be handled between the LEA and the licensor.

If the PSP Infrastructure compresses a message using codes or abbreviations, then the PSP Infrastructure will decompress the message prior to sending it to the LEA.

If the PSP Infrastructure compresses a message using a lossless or lossy compression algorithm, then the compression algorithm will be made available to the LEA. If a lossy compression algorithm is used on the call content, no translations of content will be provided as part of the Delivery process to the LEA so as to protect the integrity of information content of the message. Licensing issues associated with such algorithms are beyond the scope of this Standard and must be handled between the LEA and the licensor.

[8] CALEA, § 103(b)(3).

7. Advanced Messaging Interface (AMI) Protocol

The Advanced Messaging Interface (AMI) protocol deals with only the transfer of application layer information from the Data Delivery Point for LEA(s) as shown in Figure 4. The delivery network is based on the computer industry standard TCP/IP protocols, but the specification of the lower layers of this stack are beyond the scope of this document.

The AMI protocol is defined to supply the LEA-Provided CALEA Interface with:

- Lawful Authorization identifying information,
- PSP identifying information,
- Date and time of outbound or inbound message delivery to or from the Intercept Subject identified by the Lawful Authorization,
- Origin information, if reasonably available,
- Destination information,
- Termination information, if applicable, and
- Call Content.

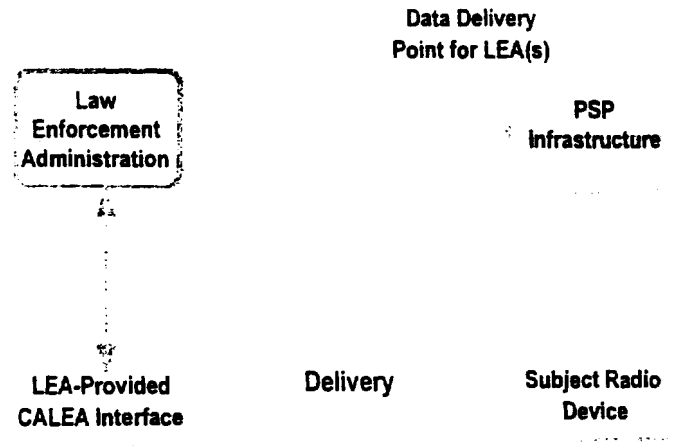

Figure 4: Data Delivery Point for LEA(s)

The AMI protocol is designed to the following criteria:

- Use standard and open protocols where possible,
- Use protocols which may be supported by the widest range of equipment,
- Use protocols which allow the use of readily available software applications by LEAs,
- Use protocols which are scaleable for platform requirements, and
- Use protocols which allow inclusion of new formats when necessary.

The protocol delivery method is HTTP v1.1's POST operation. Lawful authorization information, call content and reasonably available call-identifying information is supplied as a single file that consists of MIME-encoded concatenated vCards and Call Content as shown in the stack diagram in Figure 5.

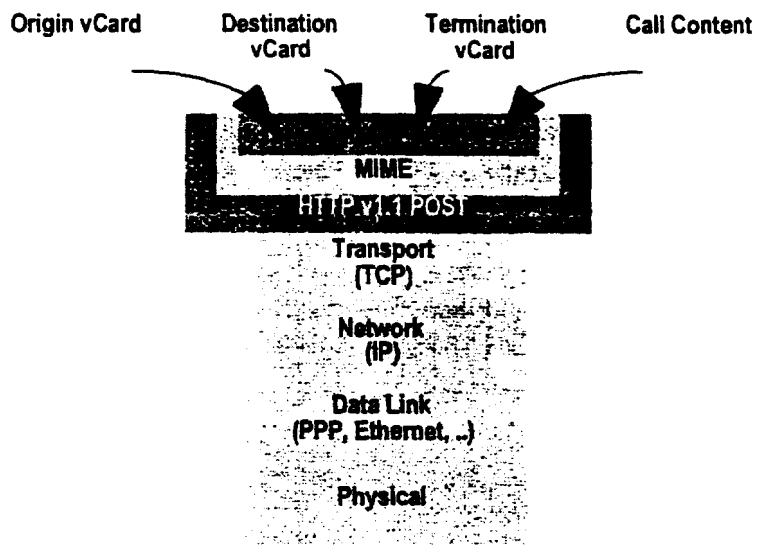

Figure 5: AMI Stack Diagram

7.1 HTTP v1.1 POST

HTTP v1.1 POST provides the ability to direct messages to specific server targets by specifying the specific server target's address for the interpreting application needed to process the operation.

The POST format for an AMI Protocol transaction has the following mandatory fields:

POST /cgi-bin/process_ami HTTP/1.1
Host: [domain name or IP of destination LEA-Provided CALEA Interface]
From: [lawful_authorization_identification]@[node].[carrier_identifier].[com]
Date: [date of call completion]
MIME-Version: 1.0
Content-Type: [type of content]
Content-Length: [length of POST Content in octets]
[POST Content]

where

- **/cgi-bin/process_ami** identifies the path ('cgi-bin' - mandatory) to the 'process_ami' application (e.g., 'process_ami.asp', 'process_ami_joe_n_pete_paging.asp') needed to interpret the AMI protocol,
- **Host:** identifies the domain name or IP address of the destination LEA-Provided CALEA Interface,
- **From**: identifies the associated Lawful Authorization and the originating carrier information where
  - **[lawful authorization identification]** is the information needed to uniquely identify the Lawful Authorization obtained to receive this information,
  - **[node]** is the identifying information for the PSP's originating Home Node of the Intercept,
  - **[carrier_identifier]** is the identifying information for the originating PSP, and
  - **[com]** or org, gov, edu .. is the extension of the carrier's domain name.
- **Date**: identifies the date and time (uses RFC 822 Date and Time format as modified by RFC 1123) of call completion,
- **MIME-Version**: identifies what version of the MIME protocol was used to construct the message,
- **Content-Type**: identifies the type of content,
- **Content-Length:** identifies the length of the POST Content data file in octets, followed by
- **[POST Content]** the actual POST Content data file.

An example of such a POST header for a POST Content data file consisting of a multipart MIME message of 3819 octets in length is:

```
POST /cgi-bin/process_ami.asp HTTP/1.1
Host: www.LEA1.gov
From: 1T234G78@st_louis.joe_n_pete_paging.com
Date: Sun, 15 Jun 1998 14:49:37 GMT
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary=--content
Content-Length: 3819
--content
Content-Type: text/x-vcard; charset=us-ascii; name="destination.vcf"
(mandatory blank line)
[actual content of destination.vcf]
(mandatory blank line)
--content
Content-Type: text/plain; charset=us-ascii
(mandatory blank line)
[actual text content]
(mandatory blank line)
--content--
```

All fields use the definitions given in the HTTP v1.1 RFC 2068 and the MIME protocol RFCs 2045 through 2049.

7.2 HTTP v1.1 POST Content

The content of the POST operation is a single file consisting of MIME-encoded concatenated vCards followed by the Call Content as shown in the stack diagram in Figure 5. All vCard fields use the definitions given in the vCard 2.1 specification or the vCard v2.1-IrDA extension specification except as noted in Section 7.5. All MIME fields use the definitions given in RFC 2045 through RFC 2049.

7.3 vCards

The concatenated vCards includes at least one of the following:

- 'origin.vcf' vCard used to identify the origin of the message,
- 'destination.vcf' vCard used to identify the destination of the message, or
- 'termination.vcf' vCard used to identify the termination of the message.

Support for all AMI-identified vCard properties and parameters is mandatory for AMI server applications conforming to this specification. However, all vCard 2.1 and vCard 2.1-IrDA properties and parameters (e.g., other TEL and EMAIL parameters) are applicable and may be used. However, if such a non-supported property or parameter is encountered, then the server application must provide the field in the delivered format as a COMMENT.

7.3.1 Origin vCard

The 'origin.vcf' vCard contains the relevant identification information for the origination of the message.

If the origination is the Intercept Subject, then this vCard is mandatory with format as follows:

```
BEGIN:VCARD
VERSION:2.1-IrDA
N:[Intercept Subject's Name]
TEL;PAGER:[PIN]
X-PCIA-CAPCODE:[CapCode]
END:VCARD
```

where the [Intercept Subject's Name] is the Intercept Subject's name, if reasonably available, or simply the name 'intercept subject', if not reasonably available. Use of the TEL or X-PCIA-CAPCODE properties will depend on the type of Lawful Authorization supplied.

If the origination is not the Intercept Subject, then this vCard is supplied only if reasonably available with format as follows:

```
BEGIN:VCARD
VERSION:2.1
N:not available
TEL:[Phone Number]
EMAIL;INTERNET:[name@domain]
TEL;PAGER:[PIN]
END:VCARD
```

where the name is a choice of the names 'not available', if not reasonably available, 'PIN Name', or 'System' depending on the nature of the origination point and reasonably available origination information. Use of the TEL or EMAIL properties is mutually exclusive in this context and will depend on the nature of the origination.

7.3.2 Destination vCard

The 'destination.vcf' vCard contains the relevant identification information for the destination of the message.

If the destination is the Intercept Subject, then this vCard is mandatory with format as follows:

BEGIN:VCARD
VERSION:2.1-IrDA
N:[Intercept Subject's Name]
TEL;PAGER:[PIN]
X-PCIA-CAPCODE:[CapCode]
UID:[Message Number]
END:VCARD

where the [Intercept Subject's Name] is the Intercept Subject's name, if reasonably available, or simply the name 'intercept subject', if not reasonably available. Use of the TEL or X-PCIA-CAPCODE parameters will depend on the type of Lawful Authorization supplied.

If the destination is not the Intercept Subject, then this vCard is mandatory with format as follows:

BEGIN:VCARD
VERSION:2.1-IrDA
N:not available
TEL:[Phone Number]
TEL;PAGER:[PIN]
EMAIL;INTERNET:[name@domain]
X-PCIA-CAPCODE:[CapCode]
UID:[Message Number]
END:VCARD

where the name is a choice of the names 'not available', if not reasonably available, 'PIN Name', or 'System' depending on the nature of the destination point and reasonably available destination information. Use of the TEL, EMAIL, or X-PCIA-CAPCODE parameters is mutually exclusive in this context and will depend on the nature of the destination.

Since the 'destination.vcf' vCard is always present, the Call-Identifying Message Number is carried in the Destination vCard as the UID. Use of the Call-Identifying Message Number is optional in one-way transactions and mandatory in two-way transactions to allow tying of related outbound and inbound messages when the latter is known to be a response to the former by the PSP.

Lists of addressees (e.g., terminal group call) are to be treated as individual transactions.

7.3.3 Termination vCard

The 'termination.vcf' vCard contains the relevant identification information for the termination of the message.

If the Intercept Subject has forwarded messaging to another destination, then this vCard is mandatory with format as follows:

```
BEGIN:VCARD
VERSION:2.1
N:[Termination Subject's Name]
TEL;PAGER:[PIN]
TEL;FAX:[fax number]
EMAIL;INTERNET:[name@domain]
X-PCIA-CAPCODE:[CapCode]
END:VCARD
```

where the [Termination Subject's Name] is the Termination Subject's name, or is a choice of the names 'not available', if not reasonably available, 'PIN Name', or 'System' depending on the nature of the termination point and reasonably available termination information. Use of the TEL, EMAIL, or X-PCIA-CAPCODE parameters is mutually exclusive in this context and will depend on the nature of the termination.

Lists of addressees (e.g., terminal group call) are to be treated as individual transactions.

7.4 Call Content

The nature and interpretation of the Call Content is defined by the MIME type identifier(s) associated with the Call Content.

It is beyond the scope of this Standard to identify and define all MIME types currently in existence. The determination of how to interpret new or custom MIME types is the responsibility of the LEA and is also beyond the scope of this Standard.

If a custom MIME type is developed by the PSP, then the custom MIME type's encoding format(s) and algorithm(s) will be made available to the LEA, if appropriate. Licensing issues associated with such custom MIME type's encoding format(s) and algorithm(s) are beyond the scope of this Standard and must be handled between the LEA and the licensor.

Call Content must be omitted in those instances where the Lawful Authorization does not specify collecting the Call Content.

7.5 New vCard Protocol Property - CapCode

This property specifies the CapCode of the vCard-identified radio device as an 'X-' extension to vCard v2.1 as defined by the Miscellaneous Properties' Extensions section of vCard v2.1.

The property is identified by the property name **X-PCIA-CAPCODE**. The CapCode is to be indicated as follows:

CapCode	**X-PCIA-CAPCODE**

where X-PCIA-CAPCODE is defined by an ASCII string representation.

The following are examples of this parameter:

```
X-PCIA-CAPCODE:1234567
X-PCIA-CAPCODE:1T467B59
```

X-PCIA-CAPCODE:F13ACD23

X-PCIA-CAPCODE:199.3.38.10

Support for this property is mandatory for AMI protocol implementations conforming to this specification.

The following modified Backus-Naur Notation (BNF) extension to the formal definition in section 3.9 of vCard is provided to assist developers in building parsers for AMI vCards.

```
name        =       / "X-PCIA-CAPCODE"
```

7.6 Custom MIME Types and vCard Properties and Parameters

'X-' type custom MIME and vCard properties and parameters must be registered with the PCIA for use with this specification. Contact the PCIA for further information.